Part 9

Uruguayan steam locomotive list

©David Sinclair and Martin Coombs

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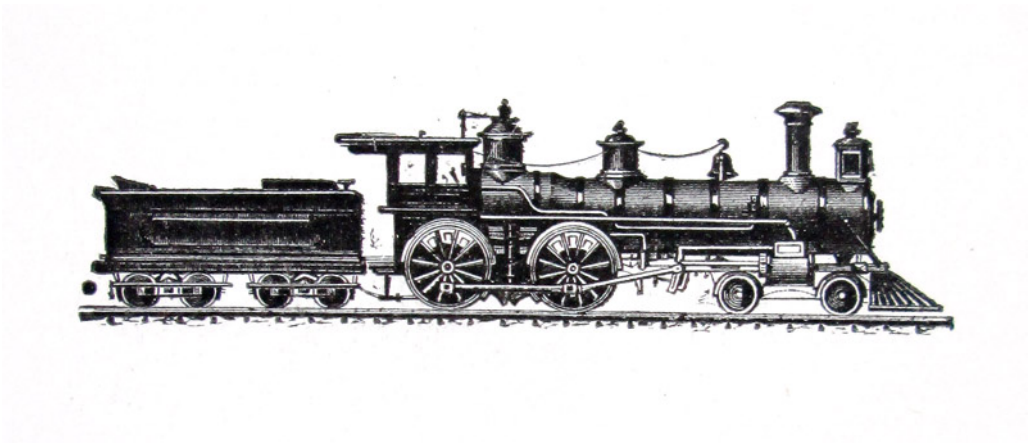
This file can be found, along with the five Chilean parts in the series and single files for a number of other smaller South American countries, at http://www.railwaysofthefarsouth.co.uk/05x03chileansteamlocos.html



These lists, though benefitting from modern technology in both research and presentation, build upon those produced by many other investigators, from Wilfred Beckerlegge and Paul Dewhurst in the 1920s to John Kirchner and Allen Copeland eighty or ninety years later. As such, their content will, I hope, be helpful for researchers and authors in the future. Feel free to use this material, though an acknowledgement would be appreciated.

General introduction

These lists grew from the publication of the book *Railways at the End of the World* (The Araucaria Press, 1 Fellview, Casterton, Westmorland, UK ISBN 978-0-9928622-0-6), back in 2014. During the research undertaken by David Sinclair and I when gathering information for that volume, it had sometimes been frustrating when locomotives in southern Chile could not be easily identified.

Once the book had been published there was more time available, and it gradually became obvious that a list of the engines of the Chilean state railways (*EFE*) would have to cover the whole country to be of any use, and thus the parts of the list expanded all the way up to Arica. In 2020, during the Covid lockdowns, the first moves were made to extend such cover to the other smaller South American countries, beginning with Ecuador and then moving on to Bolivia, Paraguay and Uruguay.

The foundations were built upon earlier lists created by others such as Allen Copeland, John Kirchner, and Reimar Holzinger. Additional information is being added bit by bit to their work. Photographs have also been added, though these have been kept small and at low resolution, partly to reduce the file sizes and partly to minimise the risk that copyright owners will object. I will be happy to remove items if anyone believes I have been too presumptuous. The main purpose of the images is in any case to enable locos spotted in other photographs elsewhere to be identified. When high-resolution versions are likely to be available from museums and archives, this has been flagged up, to encourage interested readers to purchase what they need from those who care for historic drawings or photographs.

As news of this work has spread, assistance has come from a large number of other researchers, including in particular Andrew Batory, Derek Hyland, Harold Middleton Nagel, Pablo Moraga Feliu, Martin Murray, Jens Schindler, John Schultz and Chris West. Grateful thanks is due to their selfless willingness to share information and images.

Whilst many of the written sources consulted have been in Spanish, these lists are currently solely available in English. This partly results from my own lack of linguistic confidence, but is also a reflection of the fact that keeping a fast-changing document synchronised in two different tongues is very time-consuming. Nevertheless, quotes from historic documents have usually been left in Spanish and it is to be hoped that in the future a Spanish version of the whole work can be created.

Close examination of these pages is likely to remain strictly a minority interest, whilst even fewer are likely to print out all 4600+ pages! Thus the files have been designed to be read on screen, with hyper-links from the contents page to aid in finding each section. The density of information is likely to discourage browsing on a mobile phone, but gradually the layout is being optimised for display on tablets as well as larger computers.

It will be obvious that this is a work still in progress, with updates being uploaded to the web on a quarterly basis at present. Comments, additional items of information or images, and suggestions to improve the layout, would all be very much appreciated, and the author can be contacted at **martincoombs11@gmail.com**

This Uruguayan list

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Introducción general

Estas listas crecieron a partir de la publicación del libro Ferrocarriles en el fin del mundo (The Araucaria Press, 1 Fellview, Casterton, Westmorland, UK ISBN 978-0-9928622-0-6), en 2014. Durante la investigación realizada por David Sinclair y yo cuando recopilábamos información para ese volumen, a veces había sido frustrante cuando las locomotoras en el sur de Chile no podían identificarse fácilmente.

Una vez que se publicó el libro hubo más tiempo disponible, y gradualmente se hizo evidente que una lista de las locomotoras de los Ferrocarriles del Estado de Chile (EFE) tendría que cubrir todo el país para ser útil, y por lo tanto las partes de la lista ampliada hasta Arica. En 2020, durante los bloqueos de Covid, se dieron los primeros pasos para extender dicha cobertura a los otros países sudamericanos más pequeños, comenzando con Ecuador y luego pasando a Bolivia, Paraguay y Uruguay.

Los cimientos se construyeron sobre listas anteriores creadas por otros como Allen Copeland, John Kirchner y Reimar Holzinger. Se está agregando información adicional poco a poco a su trabajo. También se han agregado fotografías, aunque se han mantenido pequeñas y de baja resolución, en parte para reducir el tamaño de los archivos y en parte para minimizar el riesgo de que los propietarios de los derechos de autor se opongan. Estaré encantado de eliminar elementos si alguien cree que he sido demasiado presuntuoso. El objetivo principal de las imágenes es, en cualquier caso, permitir la identificación de locomotoras vistas en otras fotografías en otros lugares. Cuando es probable que haya versiones de alta resolución disponibles en museos y archivos, esto se ha señalado para alentar a los lectores interesados a comprar lo que necesitan de aquellos que se preocupan por dibujos o fotografías históricas.

A medida que se ha difundido la noticia de este trabajo, ha llegado la ayuda de un gran número de otros investigadores, incluidos en particular Andrew Batory, Derek Hyland, Harold Middleton Nagel, Pablo Moraga Feliu, Martin Murray, Jens Schindler, John Schultz y Chris West. El agradecimiento se debe a su disposición desinteresada para compartir información e imágenes.

Si bien muchas de las fuentes escritas consultadas están en español, estas listas actualmente solo están disponibles en inglés. Esto se debe en parte a mi propia falta de confianza lingüística, pero también es un reflejo del hecho de que mantener un documento que cambia rápidamente sincronizado en dos idiomas diferentes lleva mucho tiempo. No obstante, las citas de documentos históricos se han dejado habitualmente en español y es de esperar que en el futuro se pueda crear una versión en español de la obra completa.

Es probable que un examen minucioso de estas páginas siga siendo estrictamente un interés minoritario, ¡mientras que es probable que incluso menos impriman las más de 4600 páginas! Así, los archivos han sido diseñados para ser leídos en pantalla, con hipervínculos desde la página de contenidos para ayudar a encontrar cada sección. Es probable que la densidad de la información desaliente la navegación en un teléfono móvil, pero gradualmente el diseño se está optimizando para mostrarse en tabletas y en computadoras más grandes.

Será obvio que este es un trabajo aún en progreso, con actualizaciones que se cargan en la web trimestralmente en la actualidad. Comentarios, elementos adicionales de información o imágenes, y sugerencias para mejorar el diseño, serán muy apreciados, y se puede contactar al autor en **martincoombs11@gmail.com**

Esta lista uruguaya

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List of contents

Red text = hyper-links to appropriate pages.

Other parts of this work

This is one of a number of PDF files covering the steam locomotives of Chile and several of the smaller South American countries across a wide variety of gauges. The other files can be accessed by clicking on the red hyperlinks listed below. It is hoped that further files will be added in due course.

The railways of Uruguay

Notes and sources

The structure of this document is based upon the earlier ones for Chilean locos. The starting point was the Uruguayan locomotive list in SLS file L8841, but it then became clear that unlike in some of the countries previously studied a very thorough job of studying Uruguayan steam locos had already been done by don Fabián Iglesias. Much of the information here comes from his excellent papers produced for the *AFU* or for *CEFU*. These are available via the *Ferrocarriles Uruguayos (A.T.U.)* pages on Facebook. They contain many more illustrations and are well worth perusing even by those who cannot read Spanish. Further sources are as listed. In general the locos ordered for the wider gauges have been covered first, then the narrower ones.

Sources

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[19] *Ferrocarril y Tranvía del Norte*, by Fabián Iglesias, versión 3.3, September 2013, published by the *ATU*. See the *Ferrocarriles Uruguayos (A.T.U.)* page on Facebook and then visit their files page.

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[27] *Exportación de arena y piedra en Colonia del negocio informal a las poblaciones obreras,* p 15, Prof. Mag. Sebastián Rivero Scirgalea. https://www.academia.edu/30967345/Exportaci%C3%B3n_de_arena_y_piedra_en_Colonia_Del_negocio_informal_a_las_poblaciones_obreras
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[47] *Vertical Boiler Locomotives and Railmotors built in Great Britai*n, Rowland A. S. Abbott, 1989, Oakwood Press, Ocford.
[48] *La evolución de los ferrocarriles Uruguayos a través de su material rodante (1867-1949)*, Enrique Bianchi, Werther Halarewisz, Mario Marotti, Gunnar Gil. https://archive.org/details/ferrocarriles-uruguayos-y-su-material-rodante-1867-1949-bianchi-halarewicz-marotti-gil/mode/2up
[49] *Ferrocarriles del Oeste*, 1895, Ministerio de Fomento. https://archive.org/details/ferrocarrilesdel00urug/page/n5/mode/2up

Dimensions

Imperial unit driving wheel and cylinder dimensions, ie. in inches, have been added if it seems likely that they were originally created in that system.

Photographs

Photos have been added here solely to aid in the identification of locos seen in other images elsewhere. They have been found from many different sources, and may still be in copyright. For those reasons, and to keep the file sizes down, they are of low resolution, the majority being only 600 pixels across. The names of photographers will be added as time permits. As these documents are likely to have a very limited readership and are not being produced commercially, it is hoped that copyright holders will understand and permit their presence here. If not, please contact the author and they can be removed.

The list is arranged in date order for entry to service (which may have been some time after construction) of the first engine of each class, subsequent batches of the same class follow-on, keeping all engines of the same class together; thus the list of engine numbers is not consecutive, nor are the classes in alphabetical order. There are cross-references for replacement engines.

Incidentally source [20] states that there were 237 standard gauge steam locos in Uruguay, of which 19 survive, four of them operable.

Railway names and abbreviations

Railways in Uruguay

North Western Rly. of Montevideo / North Western Uruguay Rly.
Uruguay Northern Railway
Midland Uruguay Railway
FC Central / Central Uruguay Railway
FC Nordeste del Uruguay / North Eastern Uruguay Railway / NE section of CUR
Higueritas Rly. + *FFCC del Oeste del Uruguay* + Uruguay Western Rly. & Port Ltd. + Central Uruguay Western Extension Co. Ltd.
Eastern Uruguay Railway
Uruguay Great Eastern Rly. / Uruguay East Coast Rly.
Pan American Trans-continental Railway Co.
FC Puerto de La Paloma a Treinta y Tres, aka the Uruguay Railway
FC y Tranvía del Norte
Administración de Ferrocarriles y Tranvías del Estado

Railways in adjacent countries

EFSPRG *Estrada de Ferro São Paulo - Rio Grande* – the link to Rivera in Uruguay

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Other abbreviations

d/w	driving wheels
cyls.	cylinder bore and stroke
w/n	works or builders' numbers

Uruguay

Background – the country

Uruguay is a small country in terms of South America, the smallest of those of Iberian origin. It has a population of about 3½ million people, about half of whom live in or around Montevideo. It is also a relatively modern country, the oldest town, Colonia del Sacramento, not being established until 1680 under the Portuguese, compared to Asunción in Paraguay in 1537. Montevideo was established by the Spanish in 1724.

Originally it was part of the Vice Royalty of Perú, and from 1776, the Vice-Royalty of the Río de la Plata. It was something of a buffer zone, initially between the Spanish Empire and the Portuguese Empire, then between the Argentine Confederation and the Empire of Brazil. It achieved its independence from Spain in 1828.

From 1776, Montevideo was a Spanish naval base. It is a natural harbour with access to the ocean, unlike Buenos Aires whose port facilities and access to the ocean are all man-made. The Argentine and Uruguayan flags share the use of Inti, the sun god of the Inca rulers of the Quechua peoples of Perú; the symbol in Uruguay having eight straight rays and eight curly ones, while Argentina's has sixteen of each.

The population of Uruguay is mostly European in origin rather than indigenous. Montevideo was a stop-off point for most steamers from Europe to Buenos Aires and other Argentine ports. There was a significant British influence on industry, commerce and the railways, just as there was in Argentina.

Background – the main lines

Uruguay, unlike its neighbours, Argentina and Brazil, developed its main lines on the basis of a single gauge – 4' 8½" or 1435 mm. Metre gauge main line railways were not used. The network was developed from a single station in Montevideo, with a spine railway heading north up the middle of the country, the Central Uruguay Railway, and with lines branching off both eastwards and westwards. There was a degree of national planning behind the network, unlike in many countries where development was on a piecemeal based on local interests, resulting from the passing of the *Ley de Trazado General de Ferrocarriles* (General Routing of Railways Law) of 1884 which defined six proposed lines as follows:–

• The ***Ferrocarril Central del Uruguay***, from Montevideo to Rivera with a branch to Salto and another to Paysandú;
• From ***Montevideo to Colonia*** via la Barra de Santa Lucia and Rosario;
• The ***Ferrocarril del Oeste***, from 25 de Agosto to Carmelo and Nueva Palmira via San José and a branch to Mercedes;
• The ***Ferrocarril Nordeste***, from Montevideo to Artigas (today called Río Branco) via San Ramón and Melo, with a branch to Minas;
• The ***Ferrocarril Uruguayo del Este***, from Montevideo to Laguna Merim via Pando, Maldonado, San Carlos and Rocha;
• From ***Salto to Santa Rosa*** (today called Cuareim), with a branch to San Eugenio (today called Artigas).

It may be noted that Fray Bentos and its connections from Algorta and Mercedes is not mentioned; it may be that Fray Bentos was not seen at that time as needing a connection to the port of Montevideo, when it itself had a good port. Also not mentioned is the line from Florida north-east to Km 329.

It will be seen that the railway network shown on the map on the previous page very much illustrates the routes defined above. Modern economists have expressed the view, made with the benefit of hindsight after the development of road transport, that this in its full extent represents an over-provision of railways in relation to the population and productive output of the country, and that its contraction to about 50% of its greatest extent is appropriate. Incidentally the map opposite omits the closed lime from Rosario to Sauce.

Following this law no less than five independent British railway companies were established, as follows:–

Note that in what follows the names of railways are printed in bold type and for the lines under British ownership and management are in English, as this is how they were generally formally identified; other lines are in Spanish.

The **Central Uruguay Railway**…

The **North Western Uruguay Railway** ran with a line from Salto northwards to Cabellos (today called Baltazar

Brum) to Cuareim, where it met the Brazilian railway network, metre gauge at this point. Since nationalization, a short branch line from Salto to Salto Grande was built, which connected over the barrage across the river Uruguay to the standard gauge Argentine network, thus giving access to Buenos Aires and Asunción.

The **Uruguay Northern Railway** was a short line, having only five engines, from a junction with the North Western Railway at Cabellos (today called Baltazar Brum) to San Eugenio (today called Artigas) on the frontier with Brazil.

The **Midland Uruguay Railway** ran from Paso de los Toros, where it met the Central Uruguay end on, to Chamberlein, a junction where the Central Uruguay Railway split-off to head farther north, to Tres Árboles, where there was a junction to a link line to the north to rejoin the Central Uruguay Railway at Piedra Sola, and so on to Algorta and Paysandú, where its workshops were located and continue to function, to meet the North Western Railway at Salto. In the twentieth century a branch line was added from Algorta to Fray Bentos; this is the only part of the railway which no longer carries any traffic. This railway had twenty five locomotives and was the second largest British railway.

The **Western Railway** extended from 25 de Agosto to San José and on to Puerto Sauce (now Juan Lacaze) via Mal Abrigo and Rosario. It was acquired by the Central Uruguay Railway in 1899 and was then known as the CUR's Western Extension Railway.

The **Eastern Uruguay Railway** (also known as the Central Uruguay Railway North Eastern Section) ran from Sayago on the Central Uruguay Railway, through Peñarol, where the Central Uruguay Railway had its workshops, to (Empalme) Olmos and on to Minas. The Central Uruguay Railway, extended from the central station in Montevideo, via Achar, to Río Negro, on the frontier to meet the Brazilian metre-gauge network. It expanded with the Western (Rosario, Western Railway, to Colonia; Mal Abrigo, Western Railway, to Mercedes), Northern (Río Negro to Rivera) and Eastern (Toledo to Nico Pérez to both Treinta y Tres and Melo) Extensions and the North Eastern Section (also known as the Eastern Uruguay Railway – Sayago to Toledo, Olmos, Pando and Minas)

The **Uruguay East Coast Railway** ran from (Empalme) Olmos to Maldonado, it was later extended by the *Administración de Ferrocarriles y Tranvías del Estado* (*AFE*) to Punta del Este and from Km 144 to Rocha.

The ***Ferrocarril y Tranvía del Norte de Montevideo*** operated from Montevideo to Barra de Santa Lucia. Its *raison d'être* was to serve the abattoir serving the whole of Montevideo. On the outskirts of Montevideo was a station which acted as the transition between railway and tramway. Steam traction (including two Fairlie articulated locomotives) was used on the railway portion, while the tramway was horsedrawn; meat vans ran through from the railway to their destinations on the tramway. In the early part of the twentieth century the line started conveying building sand from the opposite side of the river Santa Lucia and brought to the station by a cable-way some 2 km long. It was nationalized in 1915 and became part of the *FTE*.

The ***FC Puerto de La Paloma a Treinta y Tres*** (Caprario y Cía) was authorised by a law dated 7 April 1910 and intended to provide access to the port of La Paloma, perhaps in anticipation of the development of the area around Treinta y Tres for rice-growing as has since occurred. The first section to Rocha opened 1 April 1917, but progressed no further in this guise. It was taken over by the state enterprise (see below) as of 30 January 1919.

The government-owned ***Administración de Ferrocarriles y Tranvías del Estado*** took over a number of struggling entities begun by others,

• from Durazno on the Central Uruguay Railway to Trinidad, the sole product of the erstwhile Pan American Transcontinental Railroad;

• the Uruguay East Coast Railway out to Maldonado;

• the La Paloma to Rocha portion of the *FC Puerto de La Paloma a Treinta y Tres*, otherwise known as the Uruguay Railway;

It then built its own lines;

• from Florida on the Central Uruguay Railway north-eastward to Saranda del Yi;

• from Km 144 on the Uruguay East Coast Railway to Rocha to link up with the Uruguay Railway's short section to La Paloma;

• extending the Uruguay East Coast Railway from Maldonado to Punta del Este;

After the transfer of the British-owned railways to the government in 1949, and then the formal merging into a single nationalised *AFE* in 1952, a number of further extensions were completed:

• from Mercedes to Ombucitos (Midland Uruguay Railway), on the line to Fray Bentos, 1979;
• from Treinta y Tres onward to meet the Brazilian metre gauge railway network at Río Branco.
• northward from Saranda del Yi to Km 329.

It will be noted that of these government-built sections only the line to Río Branco now carries any traffic.

9.1 Standard gauge public railways – British owned

9.1.1 *El Ferrocarril Norueste de Montevideo*

1874-1881

The North Western Uruguay Railway Company

1881-1949

Two versions of the North Western's badge – before and after the British takeover – as seen on original carriage-side transfers in the collection of Gerald Hartley. In both cases the railway's garter and name have been imposed over the traditional Uruguayan coat of arms or *Escudo de Armas del Estado*.

Background

In order to overcome the stumbling block that the Salto Grande represented for navigation on the Uruguay River, the Northwestern Railway of Montevideo made its appearance. A contract for the building of the railway was signed on 14th July 1872, and this specified that the contractors must supply "10 Locomotive Engines" [Info from CW]. The first section of line was inaugurated on June 22, 1874 between Salto and Itapeby and was later extended in various stages to Yacuy (today Parada María). The company had financial difficulties so the construction of what was left of the line until Cuareim was interrupted until 1881, when most of the shares passed into the hands of British capital under the name 'North Western Uruguay Railway Company' [5]. Note that this railway ran completely isolated from any other until the arrival of the Midland in 1889.

The FCNO's monogram as seen on an original carriage-side transfer in the collection of Gerald Hartley.

0-6-0ST d/w 37½", cyls. 12x17", built by Manning Wardle in 1872

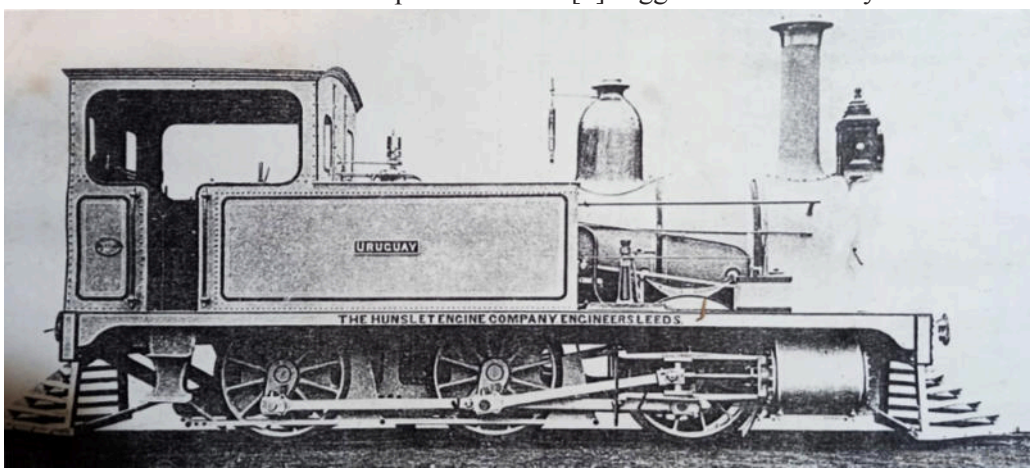
Ordered via Clark Punchard & Co. MW type K.

1 'SALTO'	w/n 395	Scrapped in 1934 [1].

0-6-0T d/w 48", cyls. 14x22", built by Hunslet in 1873-4

These locos were ordered by Clark, Punchard & Currie, the British civil engineers who built the North Western Railway and who at the same time were ordering other Hunslet locos for Tasmania and Manning Wardle engines for Argentina. Given that new engines with numbers **3** and **4** and the same names arrived in 1911, see below, it looks as though the originals with those numbers must have lost their names and perhaps had been renumbered by then. Alternatively, perhaps they were transferred to the Midland much earlier than has been reported.

2[1] 'SANTA ROSA'	w/n 107	Despatched 9-9-1873.
3[1] 'URUGUAY'	w/n 108	Despatched 20-10-1873. To Midland railway in 1931 [10].
4[1] 'ARAPEY'	w/n 109	Despatched 3-11-1873. To Midland railway in 1932 [10].
5 'ITAPEBI'	w/n 110	Despatched 24-11-1873.
6 'ARAPEY'	w/n 122	Despatched 22-8-1874. Some sources show this engine's name as **'APAPY'**, but this does not show up on any search of Uruguayan place-names. [1] suggests this loco may not have been numbered.



This image of no. **3 'URUGUAY'** recently appeared on the internet. It would seem to have been found in a contemporary journal or other publication, but when and where is not known.

Loss of locomotives at sea

The Railway Times of September 12th 1874 (p915) summarised the directors' report, which included a reference to "The delay in the arrival of several vessels, and the loss of others with locomotives and important materials on board". The identity of the lost engines has not yet been ascertained.

Double Fairlie locomotives

It has been suggested by Chris West that the pair of Fairlie locos eventually operating on the *FC y Tranvía del Norte de Montevideo* were actually ordered for this railway. Facts supporting this hypothesis include:

1 This line was a much more likely destination for such specialised machines than was the *Norte de Montevide*o which was a short distance inter-urban route.

2 Of the ten engines specified in the original contract, only six would seem to have arrived on the railway.

3 Other rolling stock ordered for this railway in early 1873, twenty-eight coaches and eighty wagons built by Brown Marshalls, was the subject of first a request to delay and later a default on payment, leading to a writ issued in March 1876 (Brown Marshalls & Co. v Clark, Punchard and Currie, evidence in The National Archives in Kew). It seems very possible that an order for locomotives placed around the same time might have been subject to similar problems, and that if the locos had been not only completed but already shipped, they might well have been trapped on the dockside in Montevideo and then sold cheaply to the first customer.

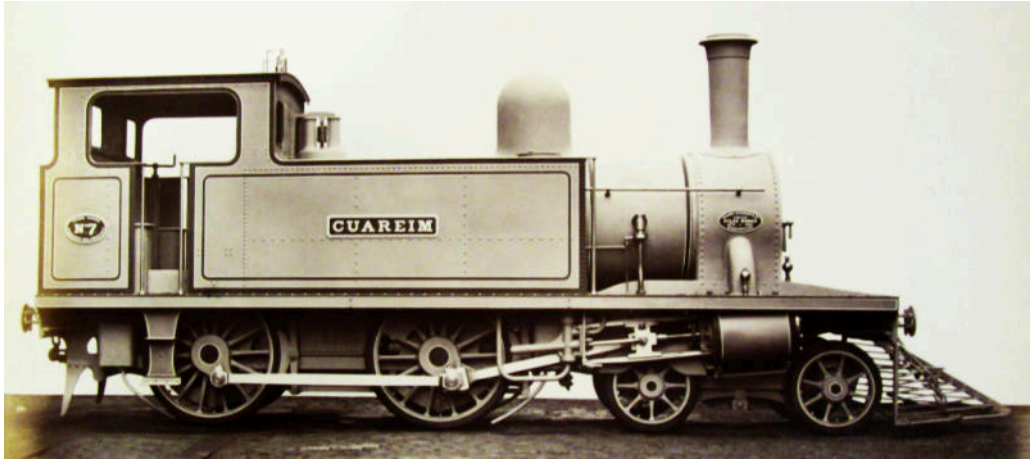
0-6-6-0 Fairlies d/w ?, cyls. 11x16", built by Avonside in 1874

'?'	w/n 1032-3	Became *FCyT del Norte de Montevideo* **'MONTEVIDEO'**.
'?'	w/n 1034-5	Became *FCyT del Norte de Montevideo* **'SANTA LUCIA'**.

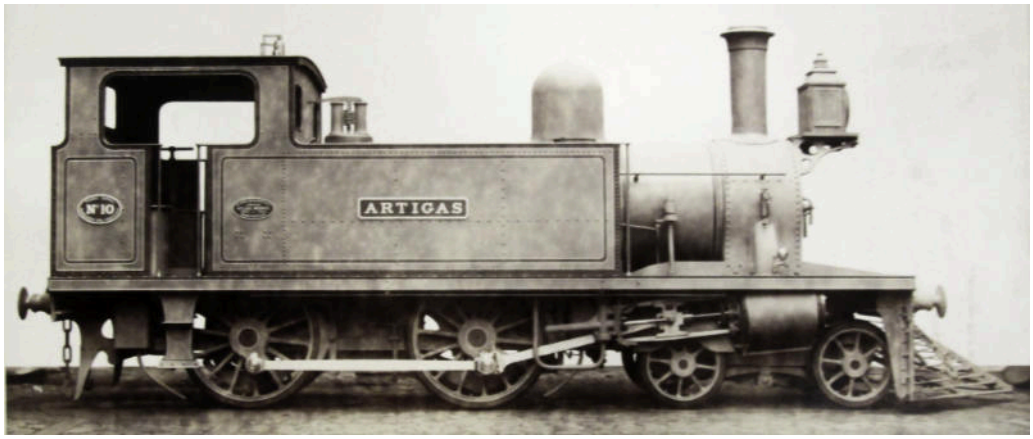
4-4-0T d/w 54", cyls. 15½x20", built by Sharp Stewart in 1886 and 1887

Later locos had cyls. 15½x21". Some sources suggest there was a third 1886 loco, no. 3375, numbered **6** on the railway, but this is belied by SS lists. The Livesey & Sons commissioning register suggests that the later pair had cylinder stroke of 21" but that is unlikely. The report of the directors preceding the AGM on 13th June 1887, stated that two tank locos had been added to the fleet since the beginning of the year.

7 'CUAREIM'	w/n 3376	
8 'YACUE'	w/n 3377	SS orders list in file NBL070 at Mitchell Library has name as **'YACUI'**.
9 'PROGRESO'	w/n 3421	
10 'ARTIGAS'	w/n 3422	



The first and last of these four Sharp Stewart 4-4-0Ts.



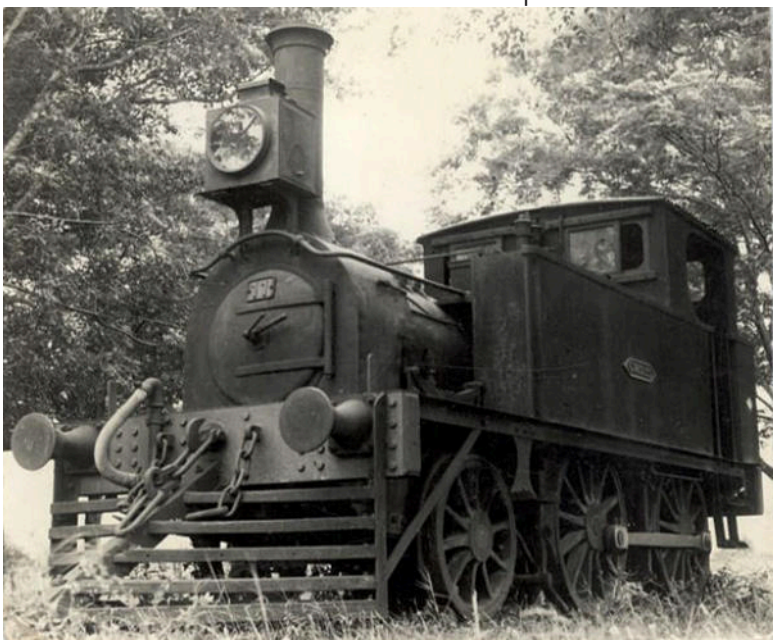
2-4-0T d/w 48", cyls. 9½x18", built by Manning Wardle in 1886

Bought second-hand in 1882-3? Origins obscure. Possibly imported for railway construction work. Might have originally been MW 634 **'HESKETH'**. Reputedly brought to Uruguay by Baynes & Squire contractors. There is a good deal of doubt about parts of this story, if the origins were the **'HESKETH'** then that loco had possessed outside cylinders 10x16" and d/w of 33". More debate about this story is in [16]. Definitely not MW 1002 as some sources suggest. That loco was reputedly for 'Africa' but Arica in northern Chile is much more probable, for the Hacienda Tomasiri near Tacna.

There has been speculation about the origin of parts of this loco. The cab would appear to have come from one of the Hudswell Clarke or Hunslet 4-4-2Ts listed below, whilst the driving wheels have the same diameter and number of spokes as those on the Hunslet 0-6-0Ts shown above. Those keen to find out more should read Fabian Iglesias Perez' 2011 paper in the files archive of the 'Ferrocarriles Uruguayos (A.T.U.)' group on Facebook.

11 'HESKETH' w/n 634? Rebuilt 1895 at Salto works and renamed **'CRIOLLO'** [1]. Nowadays classed as a national historic monument. At Technology Museum in Salto.

'CRIOLLO' in the museum shed which was its home for several decades, and below one of its builders' plates.



An old but undated photo of **'CRIOLLO'** when it was on display in the open air.

The worksplate carried by **'CRIOLLO'** since its rebuilding in 1895. Anyone looking for further close-up photos of parts of the loco is advised to visit the Facebook page of Sr. Cary de los Santos at https://www.facebook.com/media/set/?vanity=100006163848399&set=a.3217995648415865 where there are many more.

0-6-0T d/w 42", cyls. 14x20", built by Hawthorn Leslie in 1890

The HL list in file WL8723 in the SLS library has this loco as ordered for the Uruguay North Eastern railway!

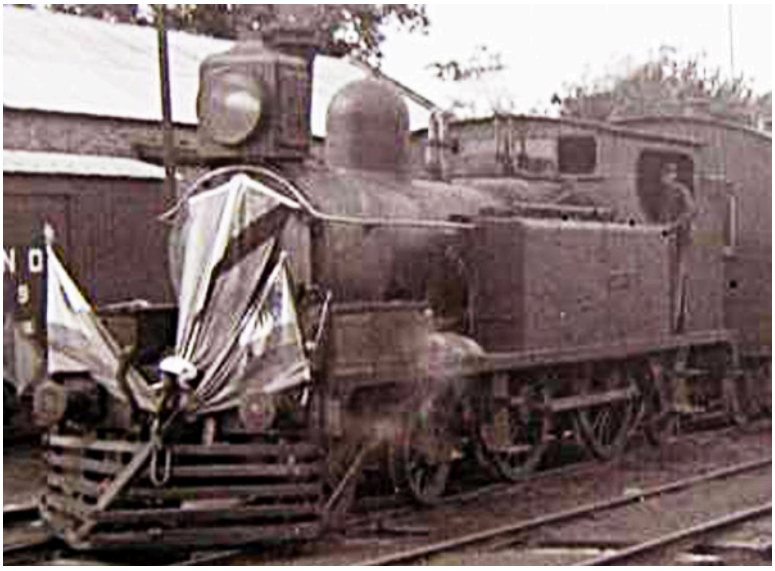
2^2 'LONDRES' w/n 2179

The fleet in 1893

The government volume of statistics for 1893 states that the Noroeste had ten locomotives in its fleet that year [37]. The 1895 volume on the other hand gives the total as eleven.

4-4-2T d/w 57", cyls. 16½x22", built by Hudswell Clarke in 1896

12 'PRESIDENTE' w/n 453
13 'ORIENTAL' w/n 454



Whilst this engine appears to be a 4-4-2T, it is not yet clear whether it was from the Hudswell Clarke or Hunslet batches.

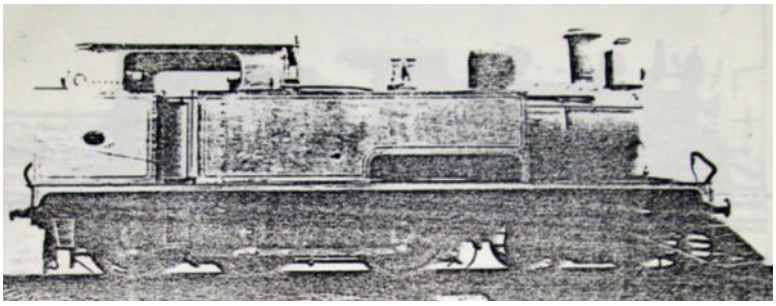
4-4-2T d/w 57", cyls. 16½x22", built by Hunslet in 1903

14 'AMERICA' w/n 795
15 'EUROPE' w/n 803
16 'AFRICA' w/n 833

4-6-0T d/w 54", cyls. 16½x22", built by Hunslet in 1911

The directors' report and accounts that was reported on in *The Railway Times* of November 4th 1911 stated that these locos had been shipped. Source [48] suggests that these engines were disliked by the permanent way staff because of their rigid wheelbase length and the damage consequently caused to the track.

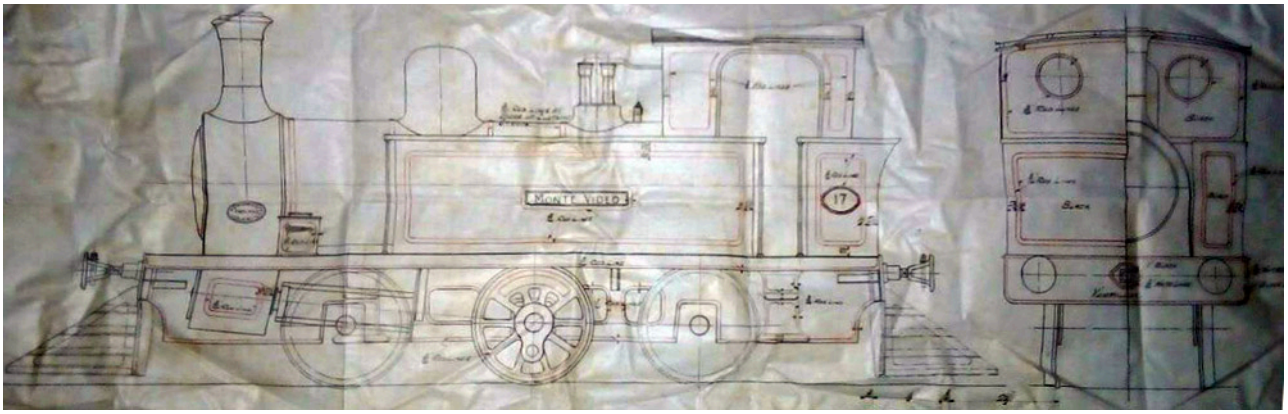
3² 'URUGUAY' w/n 1052
4² 'ARAPEY' w/n 1070



0-6-0T d/w 42", cyls. 14x20", built by Hawthorn Leslie in 1912

Ordered on 18th January 1912 for the North Western of Uruguay Rly. Co. Note space between parts of name, as clearly shown on R&WH order book page.

17 'MONTE VIDEO' w/n 2942


MONTE VIDEO
17

9.1.2 *El FC Nordeste del Uruguay*

(FC Maronas, Pando y Montevideo)

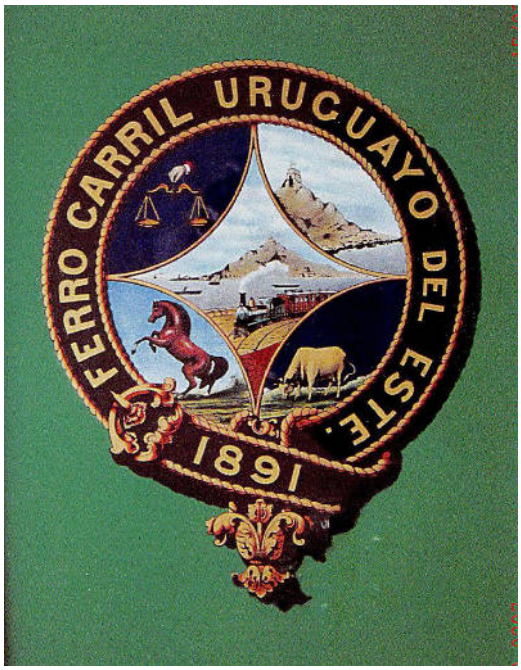
A very complex financial history from 1871 to 1887

North Eastern Uruguay Railway

1887-1889

North Eastern Section of Central Uruguay Railway

1889-1949



The garter badge of the *FC Uruguayo del Este* which was a short-lived portion of the history of this railway. As seen on an original carriage-side transfer in the collection of Gerald Hartley.

Background

An early promotor and concessionnaire of this railway was the American Mr. Ralph Russell Pealler, which may explain the purchase of Taunton locos at the beginning. Services certainly started by 1878. Note that the name *Ferrocarril Uruguayo del Este SA* forms part of the history of this project but is completely separate from the Uruguay East Coast Railway listed below. The line was taken over by the Central Uruguay Railway in 1889. But the fleet was only merged properly in 1894 [17]. so the North Eastern running numbers remained in use until then.

4-4-0 d/w 54", cyls. 12x22", built by Taunton in 1872

Ordered for Pando Mines and Montevideo according to Connelly's Taunton list. Came from contractor [1] BP 120psi. Ordered via R. R. Pealer & Co. [18] This last source says **'PANDO'** was no. **1** and was Taunton 594, and vice versa.

6 'PANDO' Had been *FC a Pando* no. **2 'PANDO'** w/n 592 Became CUR no. **15** according to PCD.

7 'MINAS' Had been *FC a Pando* no. **1 'MINAS'** later **'MONTEVIDEO'** w/n 594 Became CUR no. **16** according to PCD.

4-4-0 d/w 63", cyls. 12x24", built by Taunton in 1873

Ordered for Maronas Pando and Montevideo, according to Connelly's Taunton list. Cyls. may have been 14x24". Source [17] says that owing to a financial dispute these four locos never actually operated for this railway, instead en-

tering directly into the CUR's fleet.

(3) **'MAROÑAS'**	w/n 628 or 630	Became CUR no. **38**.
(4) **'MALDONADO'**	w/n 630 or 628	Became CUR no. **39**.
(5) **'La UNIÓN'**	w/n 631 or 629	Became CUR no. **40**.
(6) **'URUGUAY'** later **'CLEMENTINA'**	w/n 629, 628 or 631	Became CUR no. **41**.

0-6-0T d/w 42", cyls. 13x17", built by Manning Wardle in 1888

Ordered for the North Eastern of Uruguay Railway Company. One list in [1] says cyls. were 11x17". MW list says to be same as MW 300. This was of MW old class I, similar to CUR nos. **1** and **2**, in fact this was the last member of that class to be built. Fred Harman's MW book [7] suggests that this engine was built with d/w 37½" and cyls. 11x17". An article in the *Industrial Railway Record*, issue no 73 in 1977. states: "1045 is recorded as similar to 300 "but with all the latest improvements and additions" Although a "special" design, it was similar in many respects to the then standard class K engines. Apart from brass makers' plates, it also had oval brass number plates with "F C Nord-Este" above the number 1 and "del Uruguay" below The dimensions were given as: inside cylinders 11 in by 17in, 3ft 6in wrought iron wheels on a 10ft 3in wheelbase; heating surface 346 sq ft (40 sq ft in the firebox and 306 sq ft in 78 tubes of 2in outside diameter), water capacity 430 gallons. It was fitted with cowcatchers at each end, special wrought iron spring buffers and special drawgear; there was a large American style headlamp fitted and the two tail lamps had red and green movable discs."

1	w/n 1045	Became CUR no. **42**.

2-6-0 d/w 54", cyls. 16½x24", built by Beyer Peacock in 1887-1888

Ordered for the North Eastern of Uruguay.

2	w/n 2916	Became CUR no. **34**.
3	w/n 2917	Became CUR no. **35**.
4	w/n 2918	Became CUR no. **36**.
5	w/n 2943	Became CUR no. **37**.

2-4-0 d/w 54",cyls. 14x20", built by Vulcan Foundry in 1873

Ordered for CUR. Sold to North Eastern. Had originally been the CUR's **8 'VOY Al BRASIL'.**

3 'MINAS' w/n 675

0-6-6-0 Fairlie d/w 36", cyls. 11x18", built by James Cross of St. Helens in 1868

Originally built for the 3' 6" gauge Southern & Western Railway of Queensland (unwisely without the involvement of Robert Fairlie). Rejected as un-satisfactory and returned to the UK. Rebuilt and regauged by the YECo. as their contract 2007 of 24th September 1872. By May 1873 it is clear from the YECo order book that one of the three was earmarked for the Burry Port & Gwendraeth Valley Railway in Wales, but there seems to be no information about when the other two were sold to Uruguay. They arrived in Uruguay for the CUR 1874, as their no. **15**[1] and **16**[1]. This one was eventually sold to the North Eastern (in 1882?) but may never have worked again.

9	w/n 28	Scrapped 1890.

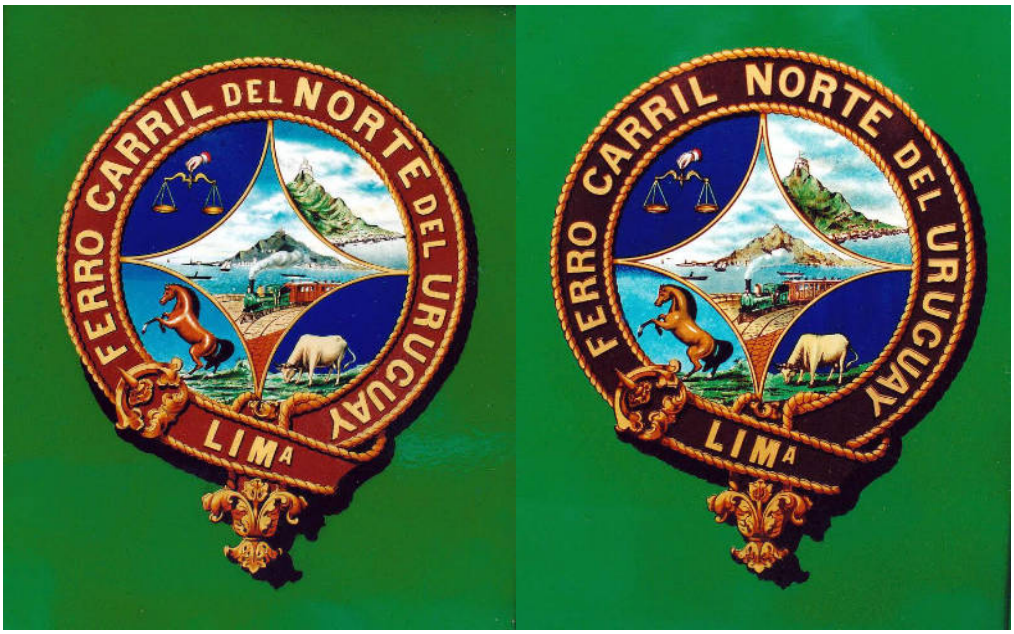
4-4-0T d/w 54", cyls. 15½x20", built by Sharp Stewart in 1887-8

These locos are listed under the North-Western railway, however, [1] implies they later came here.

7 'CUAREIM'	w/n 3376
8	w/n 3377
9	w/n 3421
10 'ARTIGAS'	w/n 3422

9.1.3 Uruguay Northern Railway

1887-1949



Two versions of the FC del Norte del Uruguay garter badge as seen on original carriage-side transfers in the collection of Gerald Hartley.

Background

Uruguay Northern Railway Co. Ltd. registered in London in 1887. Route opened 1891. 71 miles from Isla de Cabellos to San Eugenio.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

See Midland Railway section for the origin of this loco. After use on the construction of the Midland it came to Perry Cutbill de Lungo for the building of the Northern. It moved on with the contractor and never entered the Northern's regular operating fleet.

2 'DAYMAN' renamed **'SAINT EUGENE'** w/n 923 Later to the CUR.

This image almost certainly shows Black Hawthorn 0-6-0T no. 923, aka Midland Uruguay Railway no. **2 'DAYMAN'**, during the construction

of the Northern Railway [46].

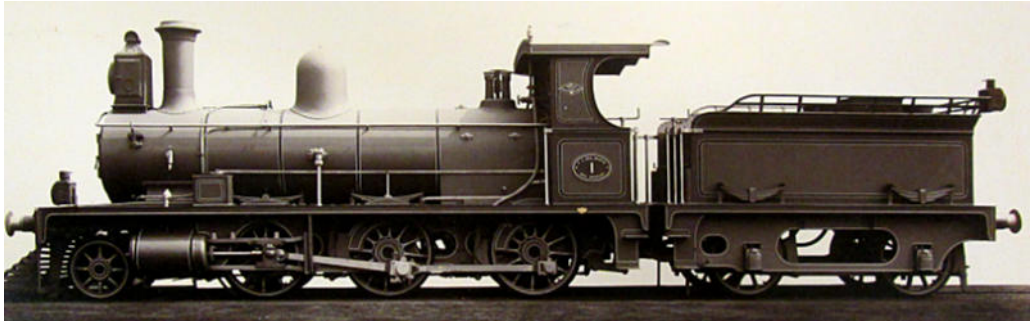
A report from November 1889

The report of the Directors to the shareholders included an Engineer's Report by James Liveset & Son. It contained the statement that: "Two locomotives and thirty wagons have been shipped."

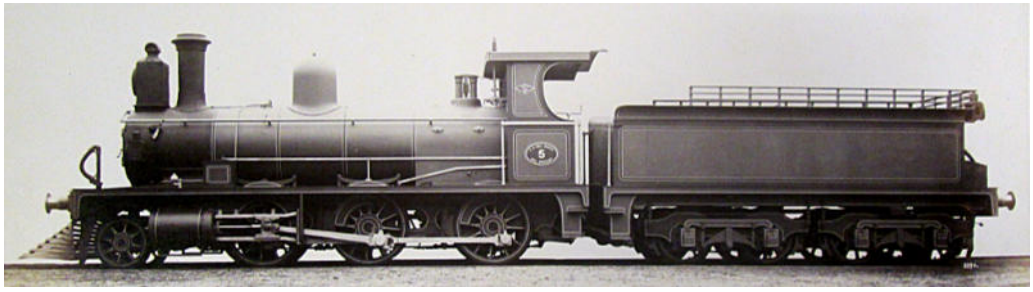
2-6-0 d/w 48", cyls. 15x22", built by Dübs in 1889 and 1896

Ordered for the Uruguay Northern Railway.

1	w/n 2484	
2	w/n 2485	
5	w/n 3390	Possibly renumbered **3** after the sale of the Falcon tank locos in 1897.



The image above shows loco no. **1** with its short four-wheeled tender, whilst that below illustrates the 1896-built no. **5** with almost double the capacity for coal and water on a bogie underframe.

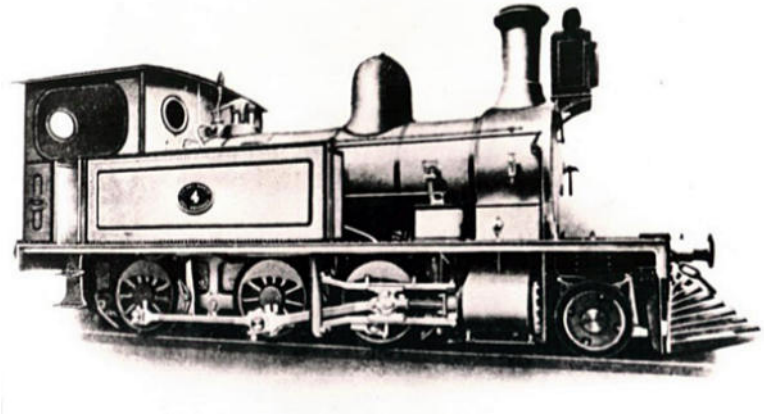


This photo almost certainly shows no. **1** or **2**, identifiable by the short tender, standing on a newly completed viaduct at Cuaro Chico [46].

2-6-0T d/w 40", cyls. 15x20", built by Falcon in 1890

Others have written that these two were numbered **4** and **5**, following on from the third Dübs 2-6-0 at no. **3**, but that engine is clearly numbered **5** in the builders' photo immediately above and it would seem much more logical for these two to have borne nos. **3** and **4**. A Falcon builder's photo exists of no. **4** but not of the other engine. Note that these two machines were fitted with inside Stephenson link motion, unlike the later Beyer Peacock and Hudswell Clarke engines to this general design which had outside Walschaert's valve gear.

3	w/n 179	Sold to CUR in 1897 to become no. **6**.
4	w/n 180	Sold to CUR in 1897 to become no. **7**.



The fleet in 1893

The government volume of statistics for 1893 states that the Northern had four locomotives in its fleet that year [37].

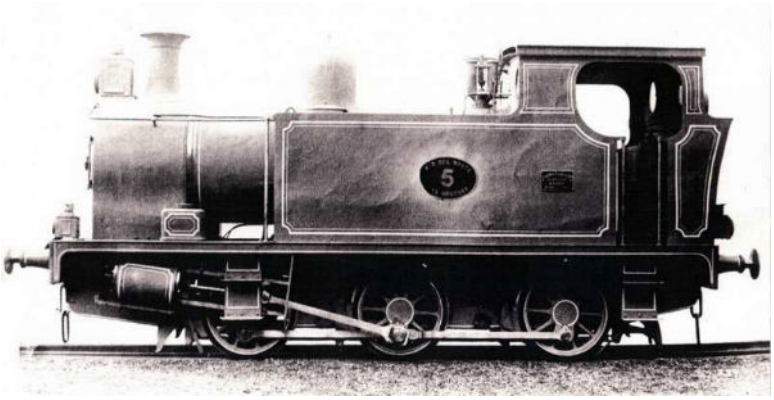
2-6-0 d/w 48", cyls. 15x22", built by North British in 1904

Ordered for the Uruguay Northern railway.

4	w/n 16349

0-6-0T d/w 1000mm 39", cyls 13x18", built by Hudswell Clarke in 1908

5 'SALTO'	w/n 824	It is not known if the loco ever ran in Uruguay bearing its name. Renumbered **196** by the *AFE* after 1952. Withdrawn August 1954 but survived at Canning near Paso de los Toros certainly until 1958 and maybe later.



9.1.4 Midland Uruguay Railway

1887/1889-1949

The *FC Midland del Uruguay* garter badge as seen on an original carriage-side transfer in the collection of Gerald Hartley.

Background

Midland Uruguay Railway Co. Ltd. registered in London in 1887, line opened 1889. Branch to Fray Bentos opened 1911. The linking branch from Tres Arboles north-eastward to the CUR at Piedra Sola was actually owned by a subsidiary the Midland Uruguay Extension Railway, though operated by the Midland itself.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

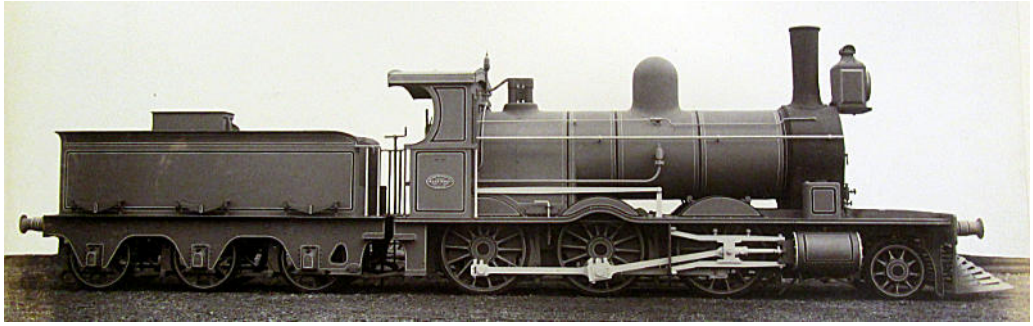
Possibly retained by contractor for use on the CUR Northern Extension Railway after the Midland railway construction had been completed. Ordered via James Perry & Co. for Midland Uruguay Railway, and named after the two rivers which the Midland Railway crosses between Salto and Paysandú.

1 'QUEGUAY'	w/n 922	Sold to *FC y Tranvía del Norte*, and then on to *FFCC del Estado*.
2 'DAYMAN'	w/n 923	Sold on to Perry Cutbill de Lungo for construction of Northern Railway, and later to the CUR. The Hawthorn Leslie boiler book says that a replacement boiler for this engine was ordered by the Uruguay State Railways in 1914, though it may have actually been for Black Hawthorn no. 922, which was by then in their fleet.

2-6-0 d/w 54", cyls. 16½x24", built by Clyde / Sharp Stewart in 1886

Ordered for the Uruguay Northern Railway according to Brian Rumary's SS list. However, NBL lists of loco orders built by their predecessors and held in the Mitchell Library clearly shows these engines as built for the Midland Uruguay Railway. Incidentally, they were ordered from the Clyde Locomotive Co. Ltd. as their order E8 and loco numbers 29 and 30, but were actually built by Sharp Stewart after they had purchased the Clyde Loco. Co. works and moved into it from Manchester.

1	w/n 3430
2	w/n 3431

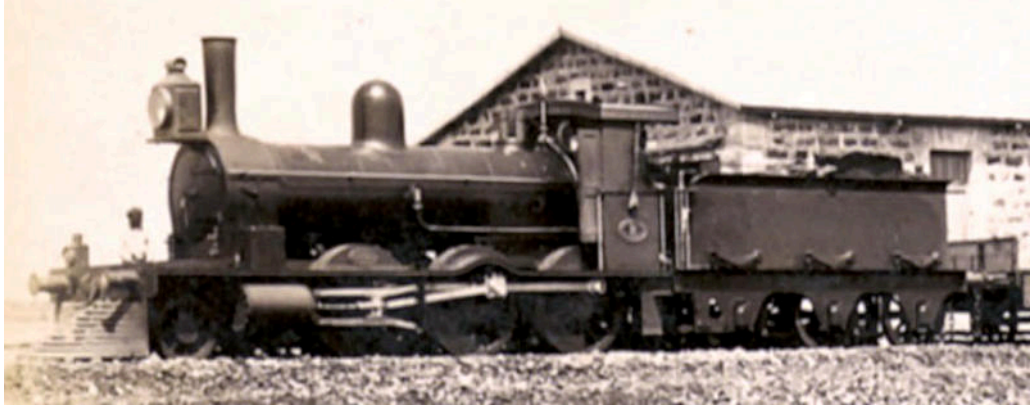


2-6-0 d/w 54", cyls. 12x20", built by Beyer Peacock in 1889

Ordered for Midland of Uruguay according to Joe Lloyd's BP list.

3	w/n 3006
4	w/n 3007
5	w/n 3008

FCMdelU no. 5 [46].

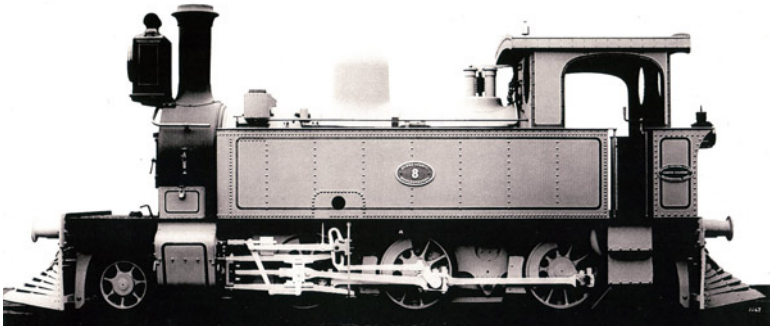


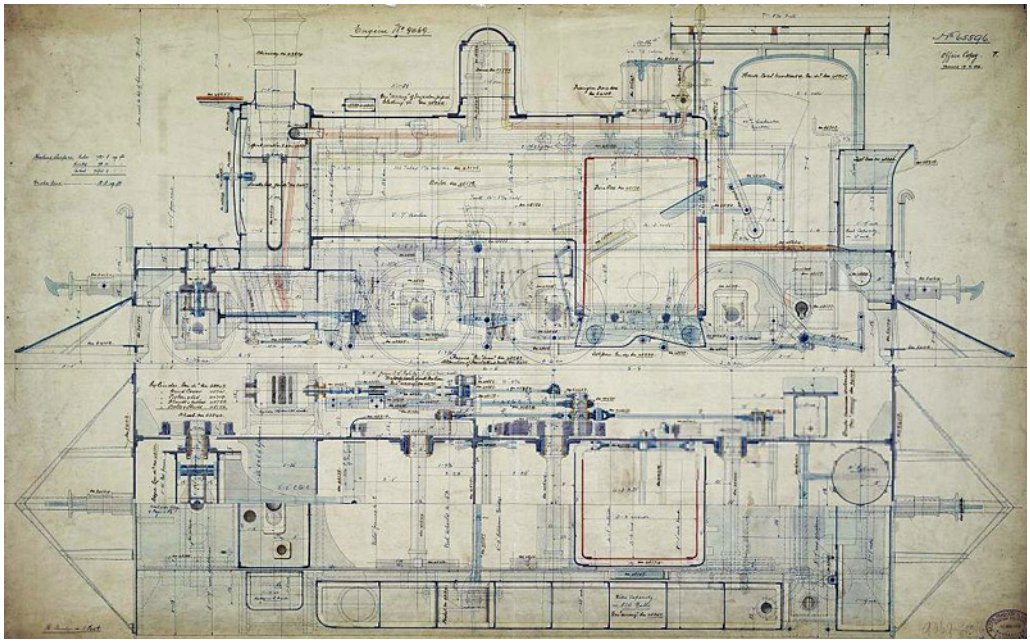
This would appear to be a member of the same class, but after some modifications. The builders' plate outside the splasher of the middle driving wheels has been removed, leaving a curve in the running board edge, and the capped chimney has been replaced by a stovepipe [46].

Class C
2-6-0T d/w 40", cyls. 15x20", built by Beyer Peacock in 1889

Ordered for the Midland of Uruguay according to Joe Lloyd's BP list. BP drawing list pp53-54 mentions hind tank as well as side tanks.

6	w/n 3009	Transferred to *FTE* in 1898.
7	w/n 3010	Transferred to *FTE* in 1898.
8[1]	w/n 3011	Transferred to *FTE* in 1898 and to CUR in 1899 as no. **4** [1].





The fleet in 1889 and 1895

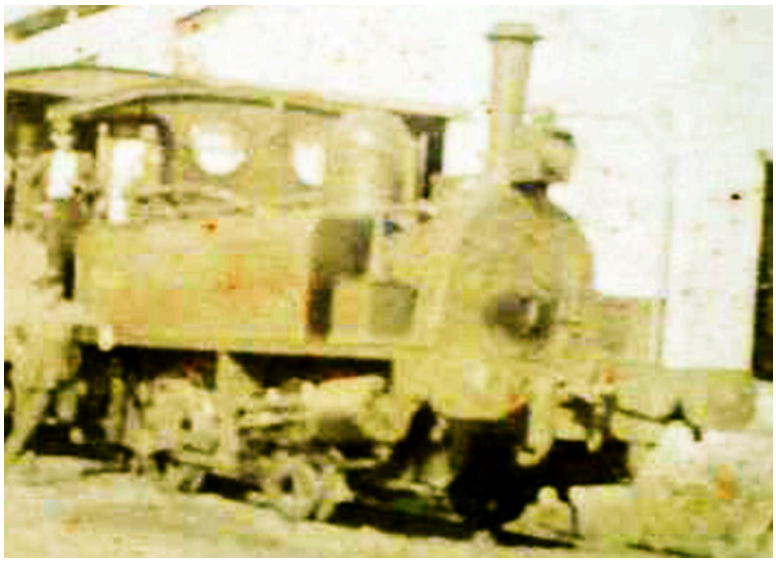
The Engineer's Report in the report to shareholders of November 1889, stated that "five locomotives, seventy waggons and six carriages have already been shipped". The government volumes of statistics for 1893 and 1895 then state that the Midland railway had eight locomotives in its fleet in the years 1890-4 but that this total had risen to nine by 1895 [37]. The report to shareholders dated 30th June 1897 then reported that two locos were still in course of erection.

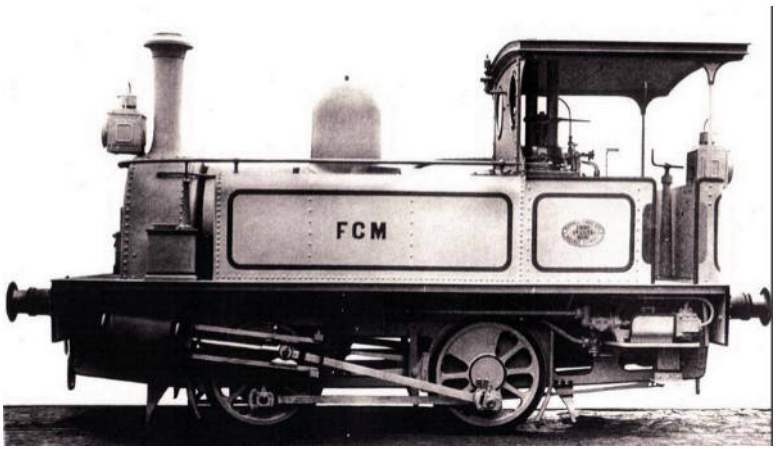
Class D

0-4-0T d/w 37", cyls. 10x16", built by Hudswell Clarke in 1895 and 1905

First one ordered via James H. Tozer, South America, and second one via James H. Tozer & Son Ltd for *FC Midland del Uruguay*. HC list says d/w 36". Despatched 2/1/1895 and 20/11/1905. [1] implies that first one at least was a saddle tank. However, Fabian Iglesias' paper on these engines [36] includes photos clearly showing no. **9** as a side tank loco.

9	w/n 432	Later became *AFE* no. **162**. Withdrawn 1953 and broken up at Canning after 1958 [36].
12	w/n 743	Later became *AFE* no. **163**. Withdrawn 1953 and broken up at Canning after 1958 [36].





A Hudswell Clarke builder's photo of one of this pair.

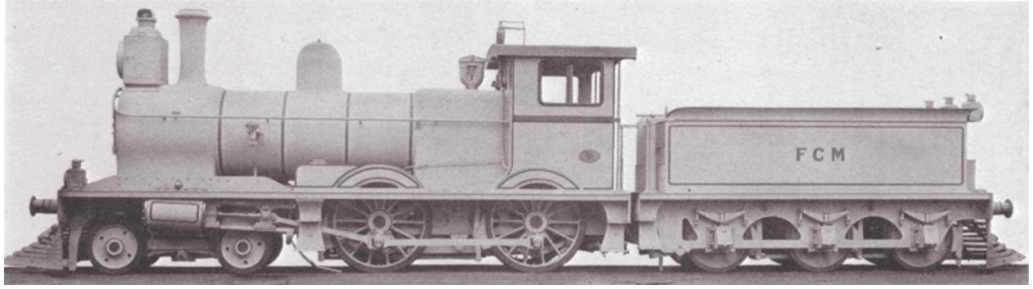
A works plate from no. **9**.

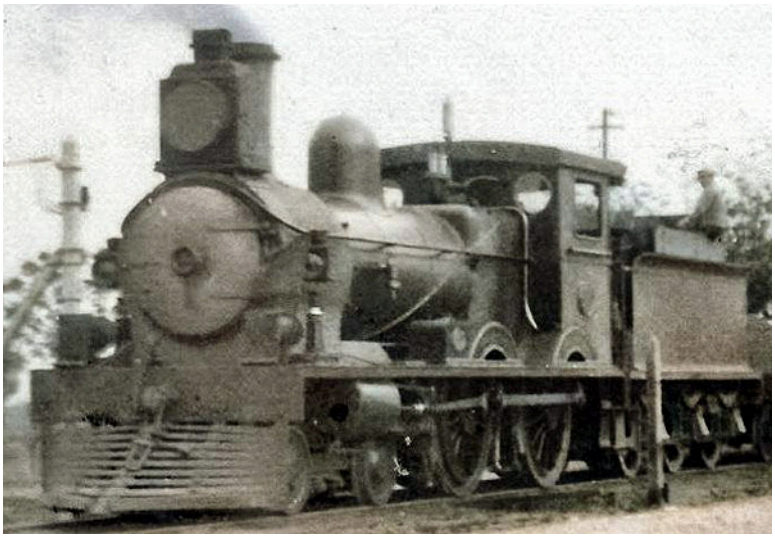
Class ?

-4-0 d/w 63", cyls. 16x24", built by Hudswell Clarke in 1898

Ordered via James H. Tozer & Sons Ltd for *FC Midland del Uruguay*. Despatched 25/6/1898.

10	w/n 481
11	w/n 482



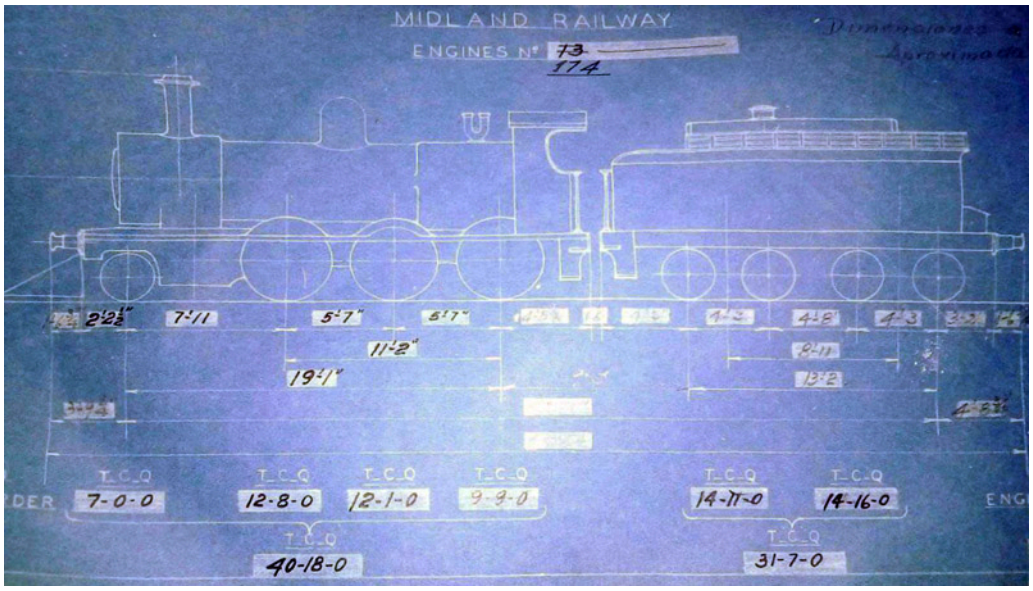


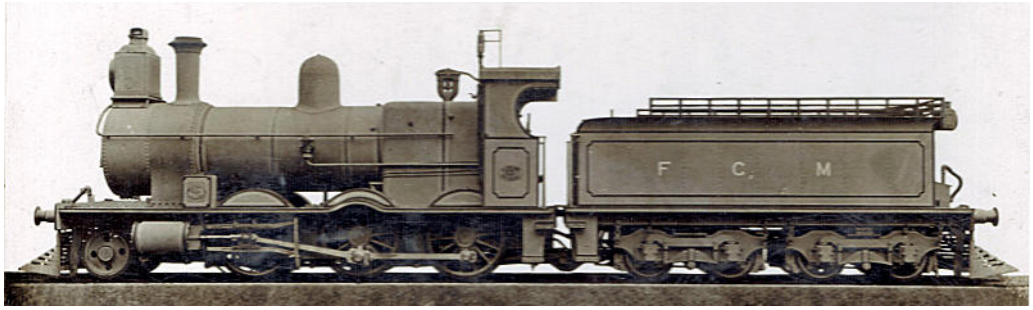
Class ?
2-6-0 d/w 54", cyls. 16½x24", built by Beyer Peacock in 1903
Ordered for Midland railway of Uruguay.

8[2]	w/n 4561	

Class F, later *AFE* class X
2-6-0 d/w 54", cyls. 16½x24", built by Hudswell Clarke in 1906
Ordered via James H. Tozer & Son Ltd for *FC Midland del Uruguay*. Despatched 31/1/1906 and 10/2/1906.

13	w/n 741	Became CUR no. **174**. Oil-fired and superheated from 1946. Seen on shed at Salto nin June 1968 [44]. Withdrawn 1977, scrapped at Bella Vista between 1980 and 1984.
14	w/n 742	Became CUR no. **175**. Oil-fired from July 1951. Withdrawn 14th April 1969. Scrapped at Canning 1969-70.





A Hudswell Clarke builder's photo found on the Historical Railway Images website by Helmut Dahlhaus. Note the cow-catchers / pilots at both ends.

Class F, later *AFE* class X

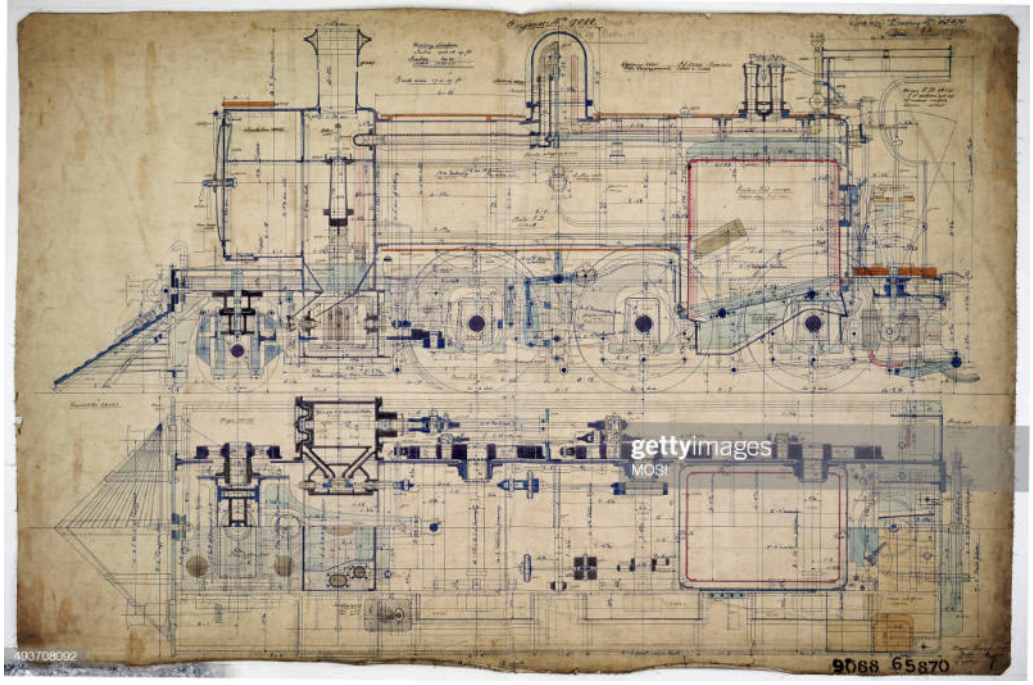
2-6-0 d/w 54", cyls. 17x24", built by Beyer Peacock in 1908-9 (15-16), 1910 (17-18), 1911 (19-20), and 1912 (21-22).

Ordered for Midland railway of Uruguay.

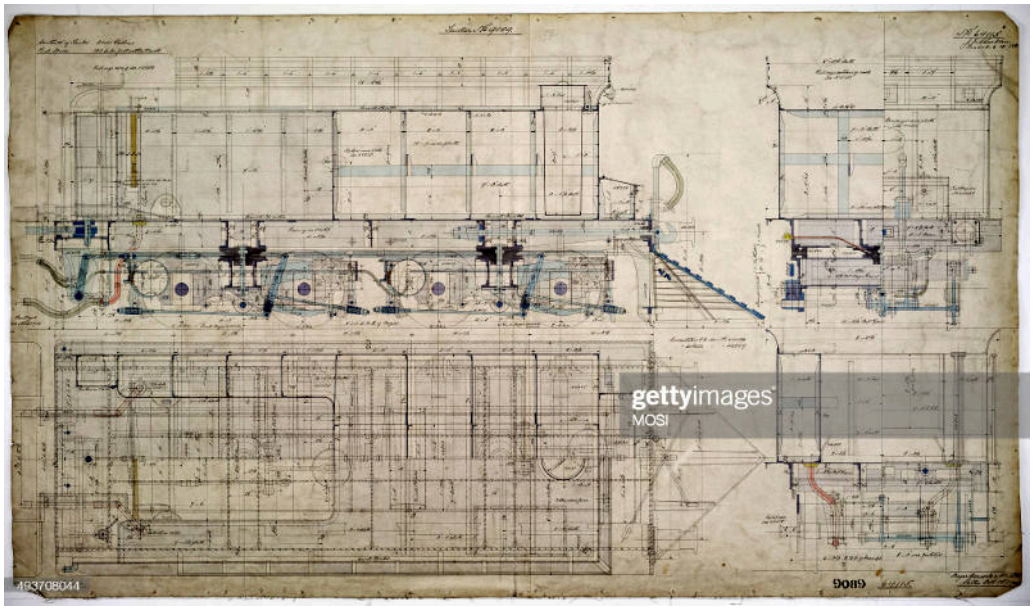
15	w/n 5152	Became CUR no. **176**. Oil-fired from July 1948. Withdrawn 31st December 1963, acquired privately from Parada Guayabos in 1969 but fate unknown.
16	w/n 5153	Became CUR no. **177**. Oil-fired and superheated from 1950. Withdrawn 31st December 1963, scrapped at Canning 1969-70.
17	w/n 5325	Became CUR no. **178**. Oil-fired and superheated from 1947. Withdrawn 14th April 1969.
18	w/n 5326	Became CUR no. **179**. Oil-fired and superheated from 1948. Actually superheated from 1938 according to plates carried. Working from Paysandu in 1975 but out of service by 1977.
19	w/n 5383	Became CUR no. **180**. Oil-fired and superheated from 1941. Withdrawn 31st December 1963, scrapped at Canning 1969-70.
20	w/n 5406	Became CUR no. **181**. Oil-fired from May 1915. Out of service in 1977.
21	w/n 5533	Became CUR no. **182**. Oil-fired and superheated from 1949. Withdrawn 14th April 1969, lay at Salto Junction in 1977, fate unknown.

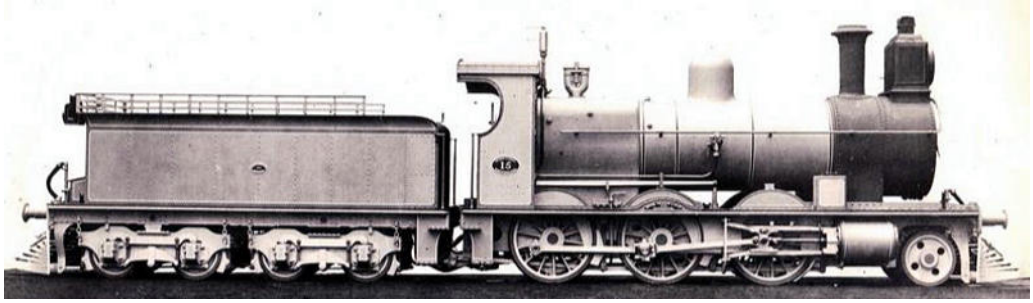
22	w/n 5534	Became CUR no. **183**. Oil-fired and superheated from 1941. Withdrawn 31st December 1963, scrapped at Canning 1969-70.

In 1935 ten new superheated boilers and ten pairs of 16.5x24" piston valve cylinders were ordered from Bagnalls. Source [41] says locos **17-19, 21** and **22** were actually reboilered in 1937-8. On the absorption into the *AFE* in 194?, the majority were re-classified as Class X1, but the three remaining unsuperheated engines, **14, 15** and **20** (becoming nos. **175, 176** and **181**) were classed as X. Baker and Civil's monumental history of Bagnall [43 p403] states that five sets of parts were originally supplied, two more in 1939, one more as a replacement (perhaps for one lost at sea?) in 1941 and two final sets in 1946.

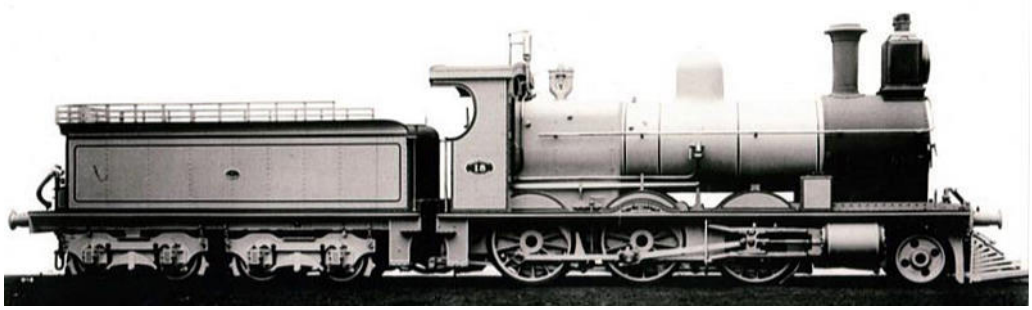


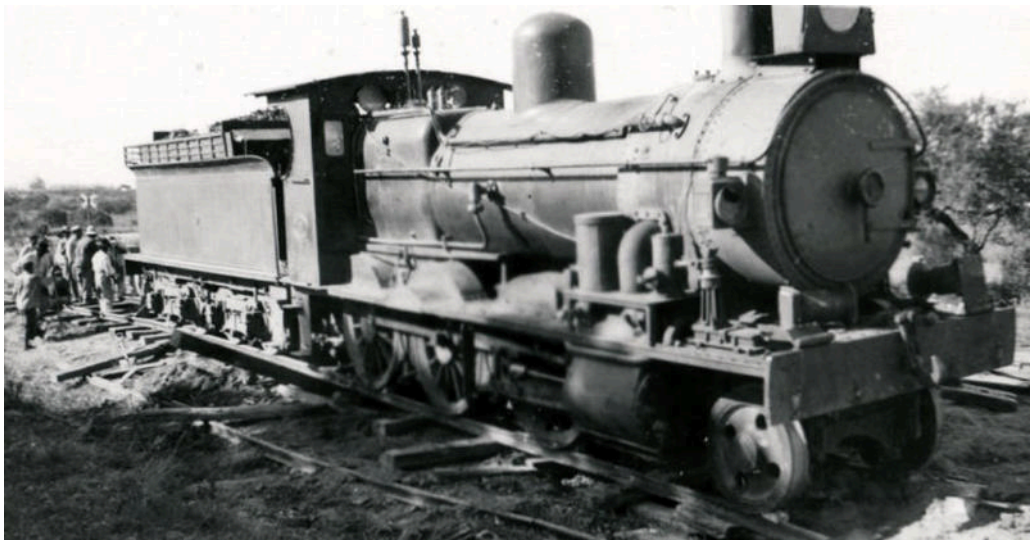
These elevations and plans are from the collections at the Manchester Museum of Science and Industry, though they are also available online via Getty Images.





The only apparent development during the intermittent production of these locos was a change in the smokebox saddle from a short pattern to a full length one. The upper photo shows engine no. **15** from 1908 whilst that illustrated below is no **18** dating from 1910.





The new piston valve cylinders required outside steam pipes; those, together with new cylindrical sandboxes and a platform to support the latter clear of the cylinder bypass valves, gave the front ends a much more cluttered look after the rebuildings. Note that the valve gear remained between the frames, with the new valves presumably driven by rocking levers. Turbo-generators were also fitted and slightly flatter curves to the cab roofs.

0-6-0T d/w 40", cyls. 15x20", built by Hunslet in 1873

Ordered for Northwest of Uruguay, their nos. **3** and **4**.

31	w/n 108
32	w/n 109

Ownership consolidation

The three railway companies in the north-west of Uruguay – the North Western Uruguay, the Uruguay Northern and the Midland Uruguay – all came under the control of the American-based Farquhar Syndicate around 1906. This consortium also attempted without success to take over ownership of the CUR. Some years later, at the beginning of the

First World War, the Farquhar Syndicate went bankrupt. Ironically it was then the CUR which took over the assets, thus leading eventually to the operational merger of the smaller companies into the CUR as mentioned below.

Joint administration

To minimise costs, the operations of the CUR, the Midland, and the Northern were combined in 1938. Midland locos **13-22** became CUR **174-183**.

9.1.5 *El FC Central*

1866-1876

Central of Uruguay Railway Co.

1876/1878-1949

The *FC Central del Uruguay* garter badge as seen on an original carriage-side transfer in the collection of Gerald Hartley.

Background

"In 1860 an Englishman presented a project for the construction of a railway between Plaza Artola (today the Thirty-Three) and Plaza de las Carretas de la Unión; In parallel, a Frenchman presented a similar project between the Plaza de las Carretas de la Aguada and the Paso Molino. Both were rejected by parliament.

At the beginning of 1865 Senen María Rodríguez, a Uruguayan, presented himself to the government of General Venancio Flores requesting the concession to build a rail line between Montevideo and Durazno (205km) passing through Las Piedras, Canelones, Santa Lucía and Florida. The project was favourably received and after the corresponding studies were approved, Mr. Rodríguez having transferred his rights to a corporation called "*Compañía del Ferrocarril Central del Uruguay*". This offered the government to carry out the project, which was approved on October 4, 1866. The company's board was made up of eminent merchants and politicians, with its general manager Señor M. Rodríguez.

The works began on April 25, 1867, 450m north of the current railway bridge over the Miguelete stream, in the Paso del Molino. On November 27 the first locomotive arrived in the country from Great Britain, which received the name "General Flores". On October 4, 1868, the first test of the road between the Saladero de Maza and La Paz was carried out, and on the 22nd of the same month the road was completed until Las Piedras, the day on which another test was carried out to that town.

On January 1, 1869, the first section of the line between Bella Vista station and Las Piedras (17km) was inaugurated, with the run of the official train that led to the President of the time, Lorenzo Batlle, Ministers and directors of the company . The initial station of the line, located in Bella Vista, at the current intersection of Uruguayana and J. Nasassi streets, was quite inconvenient owing to its distance from the city centre.

Owing to financial difficulties, the company had to resort to a loan from the Baring Brothers firm in London, to continue the line to Juan Chazo (today August 25) and to Montevideo, as well as the construction of the workshops in Bella Vista. In 1871 land was gained to the sea, allowing the extension of the road to the city of Montevideo. The pro-

visional terminal station consisted of a rented house on the corner of Río Negro and Orillas del Plata streets (today Galicia). On July 16, the service began from there while the line continued to the north, the service being inaugurated until Progreso on November 15.
In the fourth year of the inauguration of the railway, the line to Juan Chazo was completed. The Bella Vista station and the road between Montevideo and the current intersection with Uruguayana street changed their location to the place they currently occupy, and the workshops were built in Bella Vista and the original terminal station at the intersection of Río Negro and Valparaiso.
After a succession of losses, the Central Railway would pass, on January 1, 1878, into the hands of a British company founded on that date with the name of "Central Uruguay Railway Company Limited". By that date, the line had already reached Durazno." [5]

The *FC Central del Uruguay*'s initials as seen on an original carriage-side transfer in the collection of Gerald Hartley. The letters read *FCC del U Lim(itad)a*.

[It seems likely that the named engines of the *FC Central del Uruguay* did not carry numbers originally.]

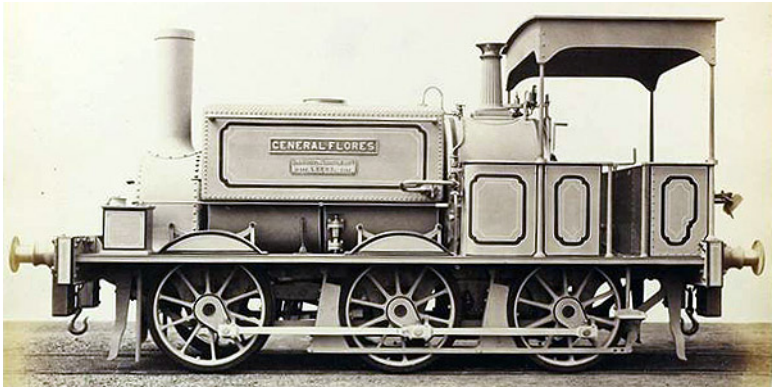
Class A

0-6-0ST d/w 42", cyls. 11x17", built by Manning Wardle in 1867 and 1870

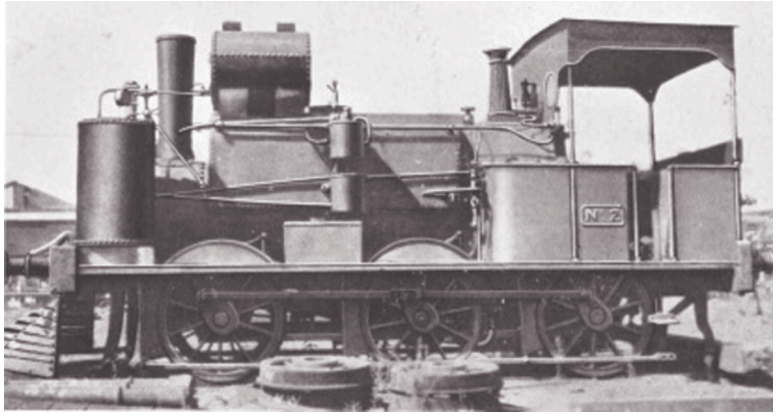
Ordered for Uruguay Co., Montevideo, presumably for *FC Central*. BP 120 lb/in 2, TE ?lb, wt about 17 tons. "235, an 0-6-0 saddle tank with 11 in [by 17in] inside cylinders and 3ft 6in wrought iron wheels, was originally class E but subsequently "old Class I" when Manning's revised their class letter system; it had a new style of canopy and a new brake arrangement but was otherwise said to be the same as Manning Wardle 192 300 is said to have been basically the same as 235 except that the canopy had a weatherscreen at the front end and was not open at the sides; it was originally class J but subsequently "old Class I". [32] says that cyls. were 11x18".

1 'GENERAL FLORES'	w/n 235	Arrived in Montevideo on 27th November 1867.
2 'CANELONES'	w/n 300	Company's report to shareholders for end of 1897 says this loco sold for £600 that year, but see photo below of it supposedly in use as a compressor in 1909.

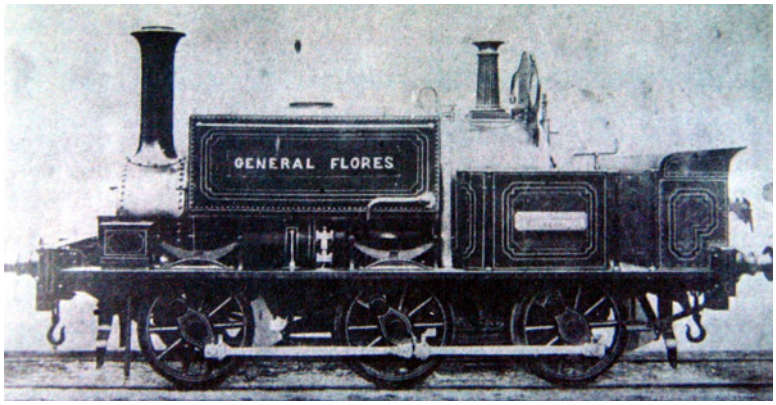
Both in service 1893 [32].



A Manning Wardle builder's photo of no. 1 'GENERAL FLORES'.



No. 2, pictured at Peñarol works in 1909, when relegated to use as a travelling air compressor. Photo from *The Locomotive* magazine, Sept. 15th 1910.



Whilst this photo shows a Manning Wardle 0-6-0ST carrying the **'GENERAL FLORES'** name, the loco is different, having smaller splashers, no cab roof, a capped chimney and a flared bunker. It was one of the later Manning Wardles painted up to represent the very first one during a commemoration long after the original loco had been scrapped.

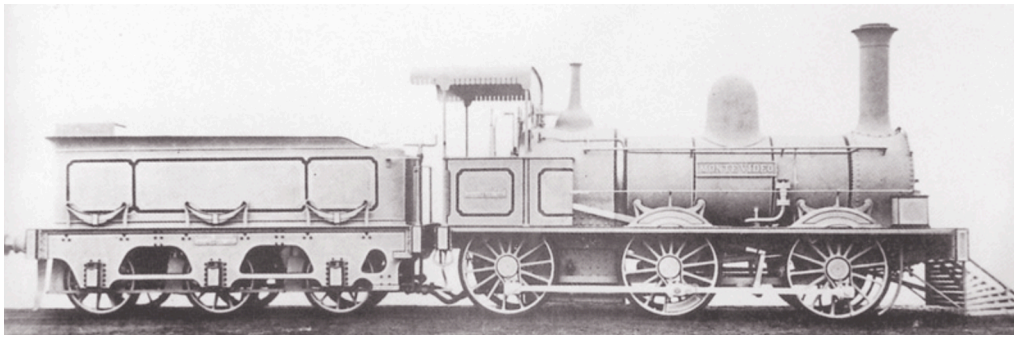
Class B

0-6-0 d/w 54", cyls. 16x22", built by Manning Wardle in 1868

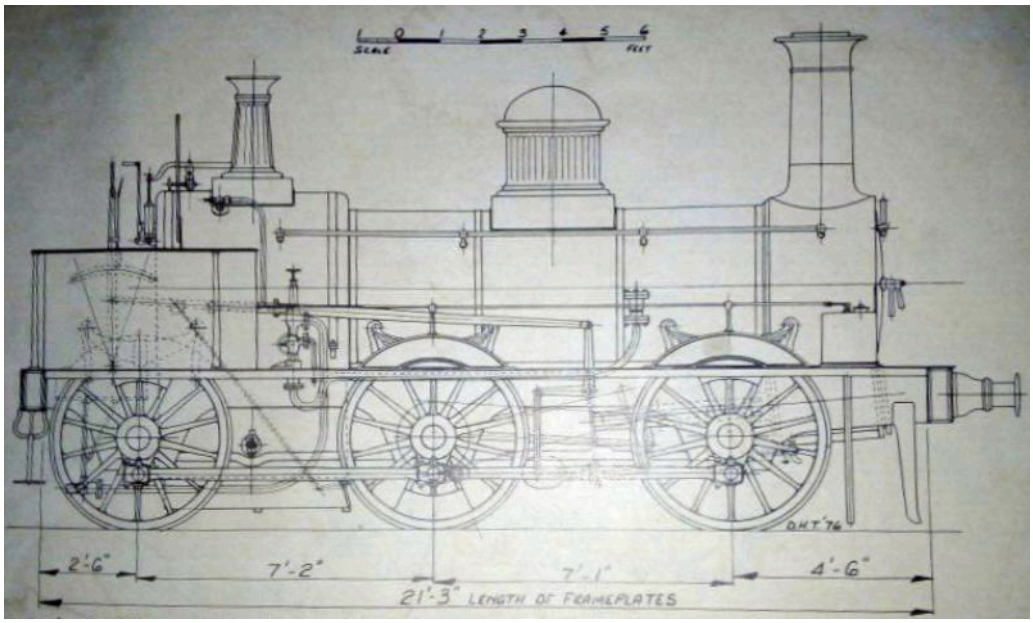
Ordered for Uruguay Co., Montevideo, presumably for *FC Central*. BP 120 lb/in 2, TE ?lb, wt ? tons. Despatched from factory 7th April and 27th May 1868. Apparently little liked in Uruguay owing to long wheelbase and problems with tube plates, though the LBSCR which had similar engines had greatly approved of them [23]. [35] gives the names the other way round.

3[1] 'MONTE VIDEO'	w/n 245	Scrapped 1896 [1].
4[1] 'Las PIEDRAS'	w/n 251	Scrapped 1896 [1].

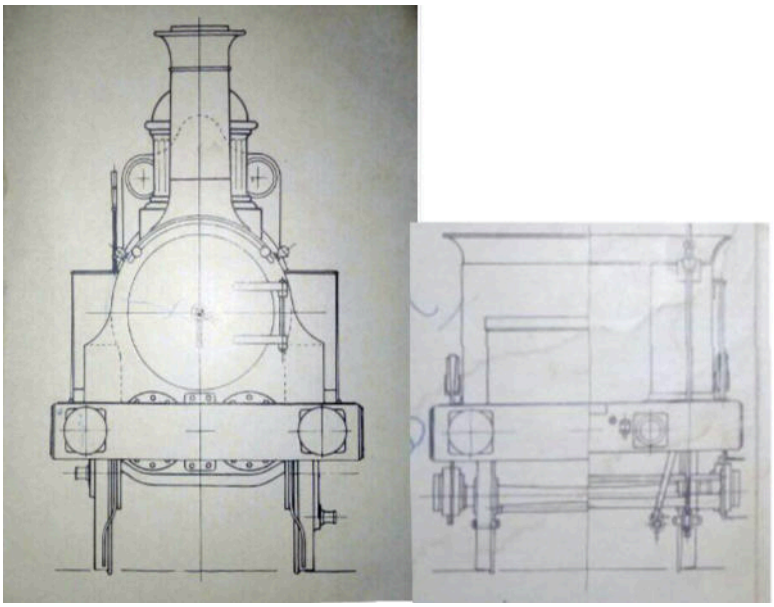
Both in service 1893 [32].

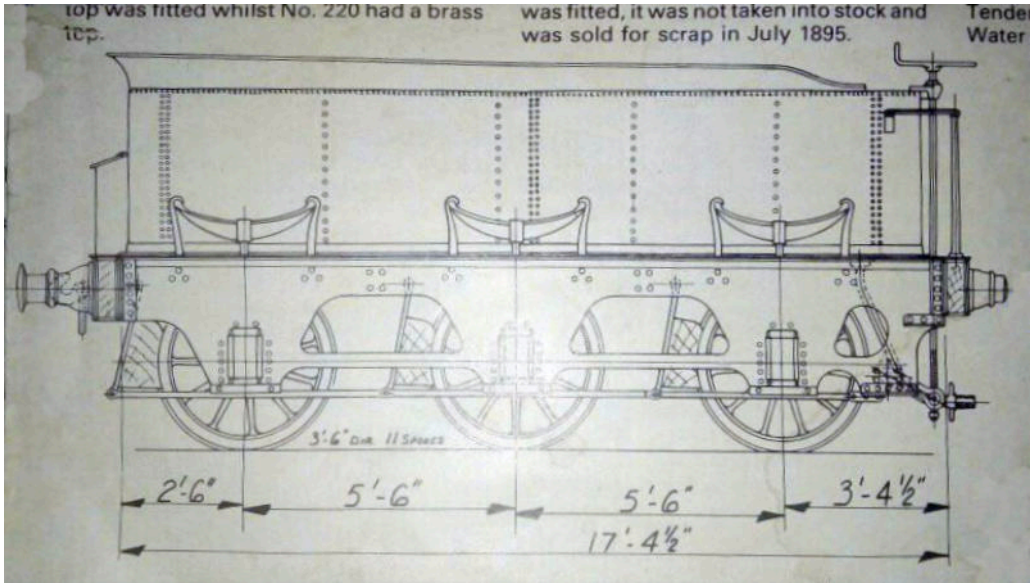


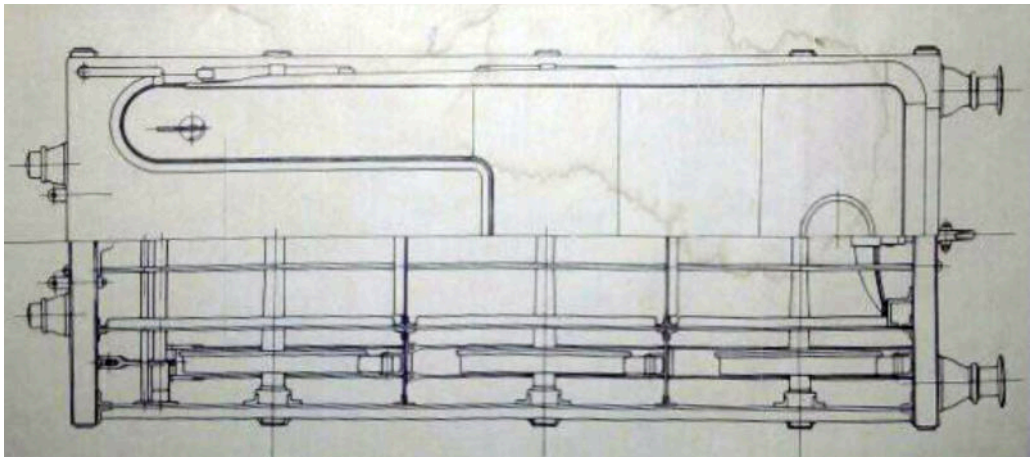
No. **3 'MONTEVIDEO'** seen in a Manning Wardle builder's photo.



It will be obvious that these drawings show slightly different boiler mountings to those in the photo above. In fact the drawings are of the sister engines supplied to the LBSCR in the UK. However, they may well be of interest, but please note that slight distortion may have crept in when the original drawings reproduced in a modeling magazine were photographed by someone unknown. Anyone wishing to to use these drawings, eg to create a model, would be well advised to check dimensions thoroughly before proceeding.







Note that the tender plan is the opposite way round to the tender side elevation for some reason.

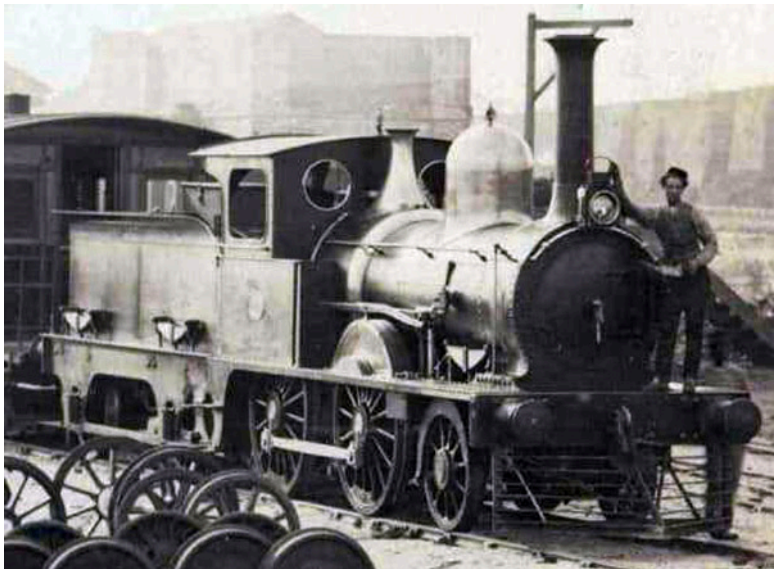
Class E-1

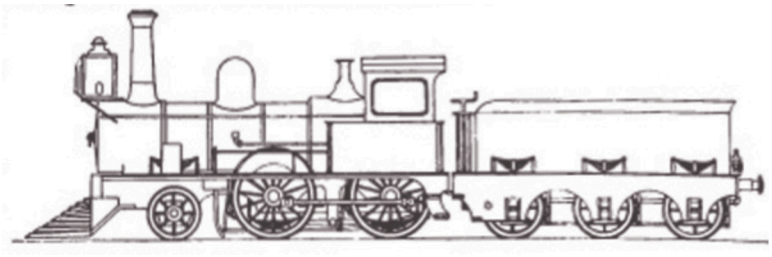
2-4-0 d/w 60", cyls. 15x20", built by Sharp Stewart in 1869

Ordered for CUR. 4-wheeled tender.

5 'La FLORIDA' w/n 1919 Scrapped 1896 [1]. But [35] says out of capital stock in 1905 and withdrawn /scrapped in 1910.

In service in 1893 [32].





This sketch was published in an article in *The Locomotive* magazine in September 1910, where it was explicitly identified as being CUR no. **5**. Note that a Beyer Peacock style six-wheeled tender is shown, which conflicts with the photo above and with other reports suggesting that the tender in1893 had only four wheels.

Class D-1

2-4-0T d/w 54",cyls. 14x20", built by Robert Stephenson in 1857

These were Birkenhead, Lancashire & Cheshire Junction Railway nos. **1 'ZENO'** and **2 'ZOPYRUS'**, later London & North-Western Railway nos. **401** and **404** from 1860, then renumbered as **1145** and **1129** in 1865. **1145** was sold to the CUR in 1865. Source [32] from 1893 lists these engines having been built in 1867 and 1870 but those may have been the years they entered service in Uruguay. **1129** was renumbered to **1133**, and then also sold to the CUR in 1865. NB Dewhurst states that these locos only arrived in Uruguay in 1874, and that they were rebuilt as 4-4-0s at Bella Vista in 1881. 6-wheeled tenders purchased in 1886 [12]. Dewhurst records d/w as 67½". Purchased by Waring Brothers for use during the CUR construction works. **'CLAIMANT'** was transferred to the new CUR operations, whilst the **'URUGUAY'** continued in construction service towards Durazno until 1874. Source [21] suggests that one or both received enclosed cabs later in their lives. NB source [32] from 1893 has these locos as 4-4-0s with 6-wheeled tender, and d/w as 67½". Cyls. as above.

6 'CLAIMANT'	w/n 1081	) Rebuilt 4-4-0 in 1881 at Bella Vista workshops, and then
7 'URUGUAY'	w/n 1082	) scrapped in 1895. D/w had originally been 63".

[21] suggests that a 1876 directors' report includes a mention of the loco **'URUGUAY'** as no. **14**.
Both in service in 1893 [32].

Class E-2

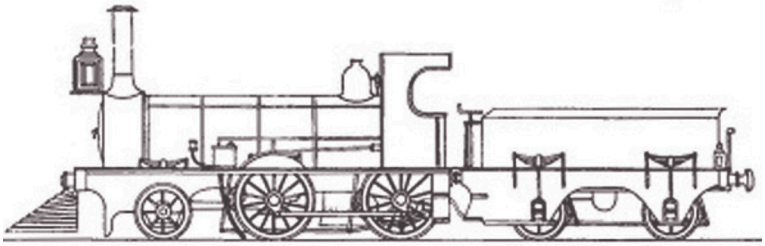
2-4-0 d/w 54",cyls. 14x20", built by Vulcan Foundry in 1873

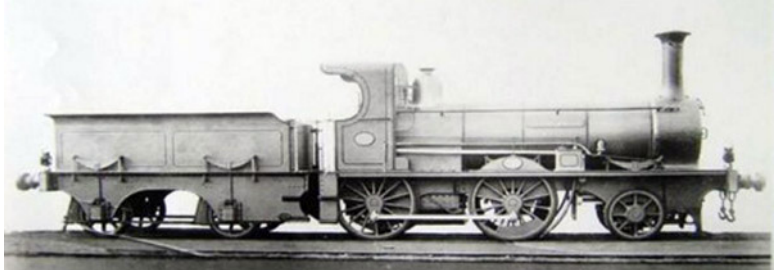
Ordered for CUR, but source [32] in 1893 has these locos as built for the *Nord-Este Central*. 4-wheeled tender, and still recorded as such by Dewhurst. Dewhurst shows no. **8** as owned by the North Eastern Railway. A CUR fleet list from 1930 gives the cylinders as 14x22".

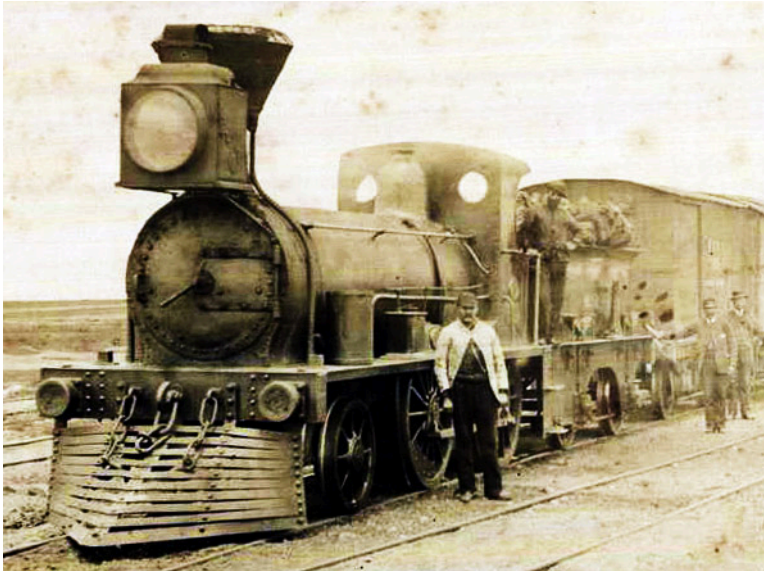
8 'VOY Al BRASIL'	w/n 675	Withdrawn 1912-13. Numbers reused in 1915.
9 'El DURAZNO'	w/n 673	Withdrawn 1911. Numbers reused in 1915.
10 'SANTA LUCIA'	w/n 674	Withdrawn Nov 1936 and scrapped Feb 1937. Boiler only sent to Río Negro for running shed service. This loco and no. **14** were last survivors of the class.
11 'RODRÍGUEZ'	w/n 677	Withdrawn 1914. Not listed as in service at end of 1941[34].
12 'REQUENA'	w/n 676	Withdrawn 1914. Not listed as in service at end of 1941[34].
13 'RÍO NEGRO'	w/n 685	Source [32] gives w/n as 683. Some sources have the names exchanged on engines **13** and **14**, but an 1870s list from Bella Vista workshops shows them as here and PCD concurred. Withdrawn 1913-14. Not listed as in service at end of 1941 [34].
14 'El YÍ'	w/n 684	Withdrawn and scrapped July 1935. Boiler sent to Bella Vista works for hydraulic plant. This loco and no. **10** were

last survivors of the class.

All in service in 1893 [32]. PCD, in a letter to John Poole, June 17th 1942, states that one of these Vulcan Foundry 2-4-0s had been sold in March 1914 to an agent in Buenos Aires, but that the eventual user was unknown.

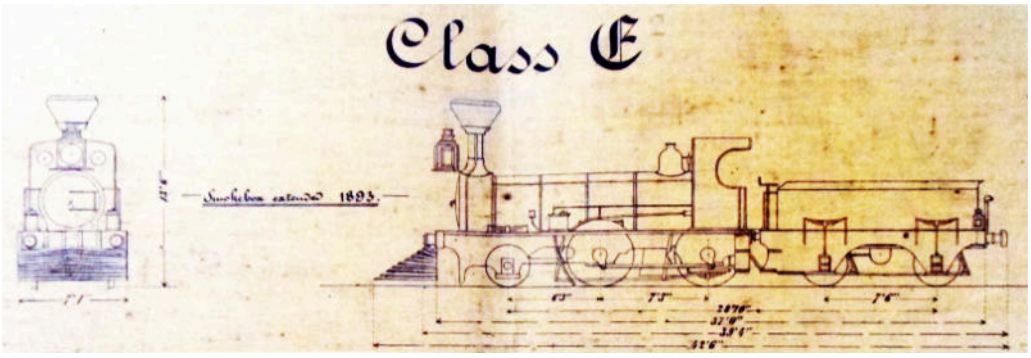






No. **12 'REQUENA'** at Florida station in 1878.

An unidentified E-2 loco on a viaduct.



A diagram of class E2, by courtesy of the Restoration & Archiving Trust. Apologies for the distortion introduced when photographing their copy of the diagram book.

The fleet in 1874

A report of the directors published in *The Railway Times* of December 12th 1874, states that the railway has fourteen locos, "of which six (of various classes and manufacture) were purchased at different times by the original Montevideo board, prior to the issue of any capital in England". Whilst the number 'fourteen' makes sense, it is difficult to be ssure which 'six' would have been ordered first, though note the information above about no. **7** only entering the CUR fleet in 1874.

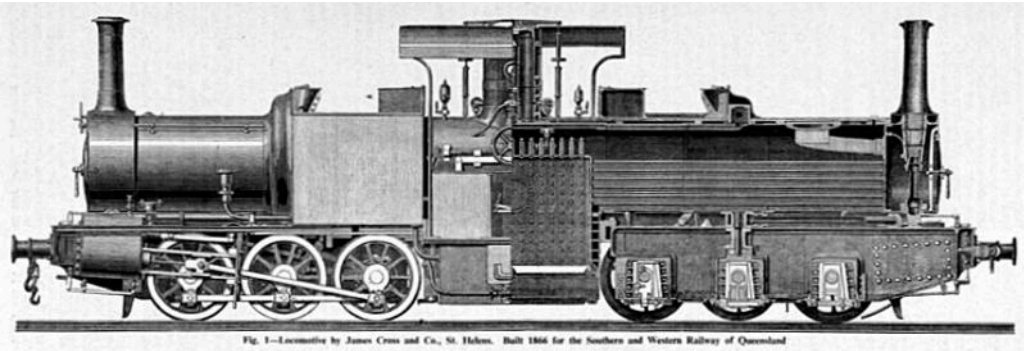
Class F?

0-6-6-0 Fairlies d/w 36", cyls. 11x18", built by James Cross of St. Helens in 1868

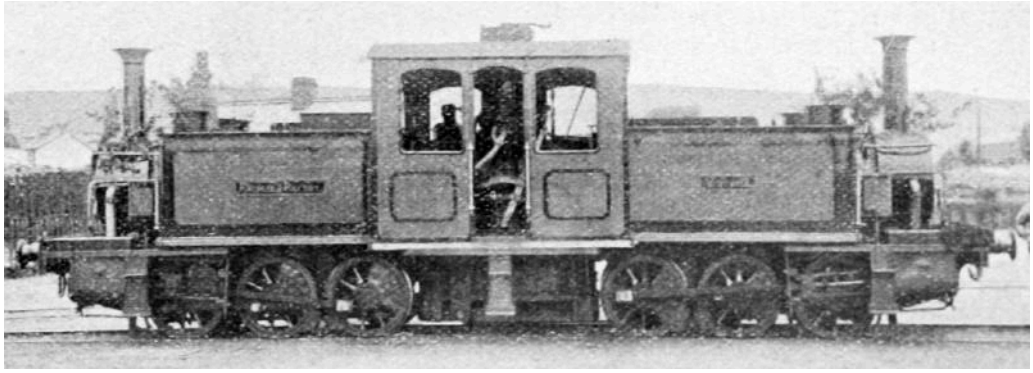
Three of these engines were originally designed by Douglas Fox and built for the 3' 6" gauge Southern & Western Railway of Queensland, unwisely without any involvement by Robert Fairlie. The design was strange in a number of ways: the tank capacity was divided between well tanks between the frames of each bogie, other low level tanks alongside the firebox, and small tanks beneath the coal bunkers; there was only a single firebox, no doubt leading to the problem of air being sucked down one chimney as the other was exhausting, a fault rectified in Robert Fairlie's own designs by that date; the primary suspension was by transverse semi-elliptical springs beaneath each axle, Rejected as un-satisfactory and returned to the UK, where they were advertised for sale by the Crown Agents in March 1872 [*The Railway Times* March 23rd 1872 p329, and March 30th 1872 p353]. They were rebuilt and re-gauged by the YECo. at Meadowhall in Sheffield, as their contract 2007 of 24th September 1872. By May 1873 it is clear from the YECo order book that one of the three was earmarked for the Burry Port & Gwendraeth Valley Railway in Wales, but there seems to be no information about when the other two were sold to Uruguay. Arrived in Uruguay 1874. The YECo supplied two orders for parts such as axle-boxes, boiler tubes, piston rings, etc. to the CUR in January 1875 but it is not possible to pin these specifically to the Fairlie locos.

15[1]	w/n 28	Sold to North Eastern railway and became their no. **9**, but may never have worked again. Scrapped 1890.
16[1]	w/n 30	Scrapped 1891.

Other sources suggests that **15** was withdrawn 1881-2 and that **16** was withdrawn 1895-6. No. **16** may then have been sold to Uruguay Western Railway and Port at Puerto del Sauce. The remains of one of these Fairlies were reported to lie still at Peñarol works in 1909 []. It is clear that these engines were no longer in the CUR fleet in 1893 when the source [32] list was made.



This sketch shows the Cross built Fairlies for Queensland as originally constructed. The hopelessly ineffective single firebox is obvious. It looks as though there were well tanks between the frames of each bogie, so the small apparent side tanks may have been largely given up to bunker space on the fireman's side.



This photo taken on the Burry Port & Gwendraeth Valley Railway in Wales shows no. **8 'VICTORIA'**, the third of the unsuccessful James Cross double Fairlies, after its rebuilding and regauging around 1873, by the Yorkshire Engine Co. P. C. Dewhurst, in a letter to a correspondent in Australia in 1943, states "the boiler (and the rest of the engine with the exception of the water tanks) as also its dimensions, exactly agree with the three Cross's engines of 1866. ... It is clear to me that the engine 'Victoria' of the B. P. and G. V. Rly. is the sister engine to the two which came here..." The engine now has proper side tanks, noticeably centred precisely over each bogie pivot line presumably to minimise additional strain on the boiler cradle. This has led to the provision of a very large cab, which interestingly has the same curved-top side windows as YECo (and Avonside) Fairlies for Peru that were being built at around the same time. NB This loco also underwent a later rebuilding, so confirmation is needed as to whether the photo was after the first or the second reconstruction.

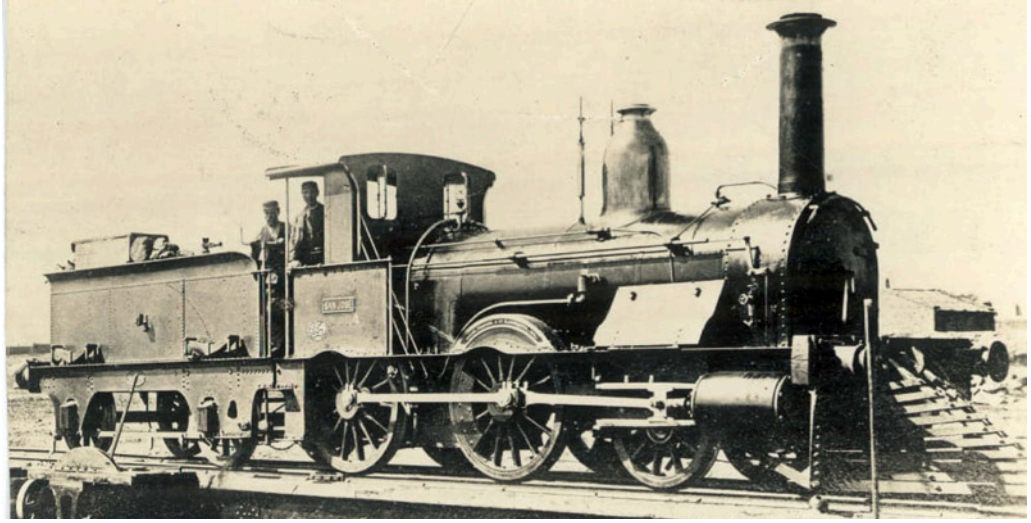
Class F

2-4-0 d/w 54", cyls. 14x20", built by Beyer Peacock in 1874

Ordered for Waring Brothers, Montevideo, Uruguay, for the Higueritas Railway, the source [32] of 1893 has these engines, possibly incorrectly, as for the *Nord-Este Central*. BP 120 psi. 4-wheeled tender. *The Railway Times* of June 19th 1875 records in detail a Directors' report which mentiones that these locos had been sent out. A CUR fleet list from 1930 gives the cylinders as 14x22", as does source [32] from 1893.

17 'SAN JOSÉ'	w/n 1424	The number **17** was reused in 1910.
18 'HYGUERITAS'	w/n 1425	

Both in service in 1893 [32]. Both withdrawn officially between 1905 and 1910 but retained in internal service (eg PW trains) until as late as 1919 [42].



The Heberlein brake

According to a Directors' report in *The Railway Times* of April 10th 1880 (p298) the railway was at that time using Heberlein brakes.

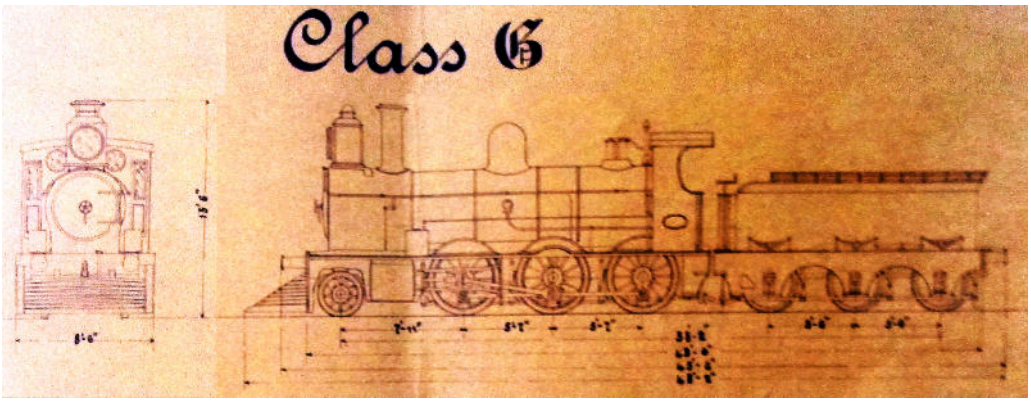
Class G-1

2-6-0 d/w 54", cyls. 16½x24", built by Beyer Peacock in 1881

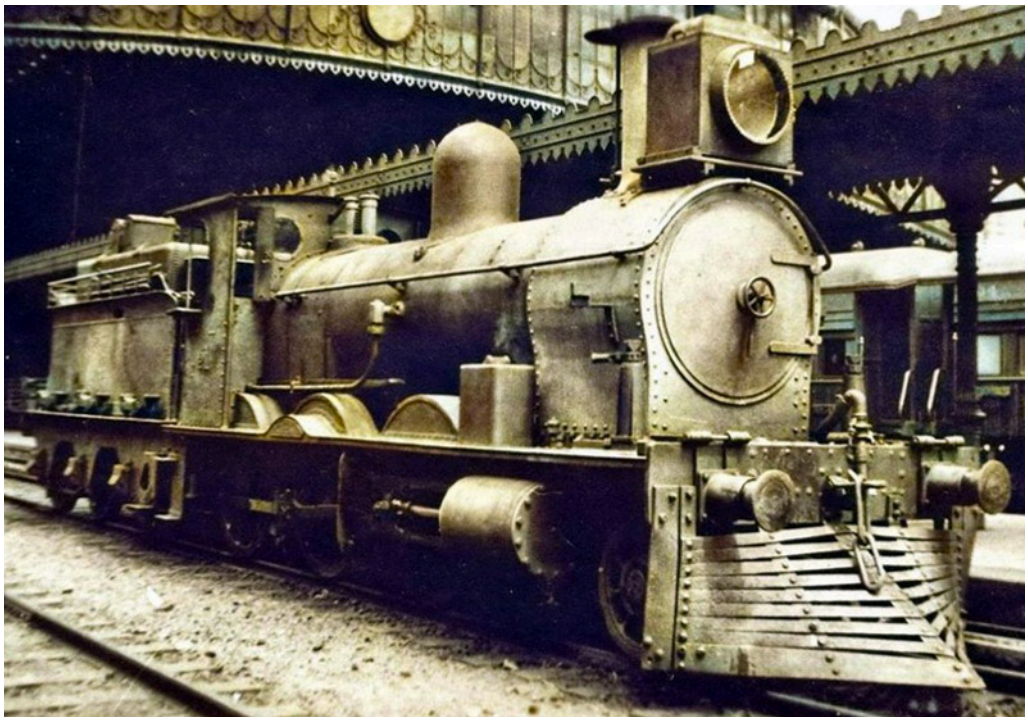
Ordered for Central Uruguay Railway. 6-wheeled tenders. BP 160psi. PCD, in a letter to John Poole dated April 26th 1945, stated that these three locos had open cabs, stove-pipe chimneys and donkey pumps, so possibly the photos below are actually of later engines of this class.

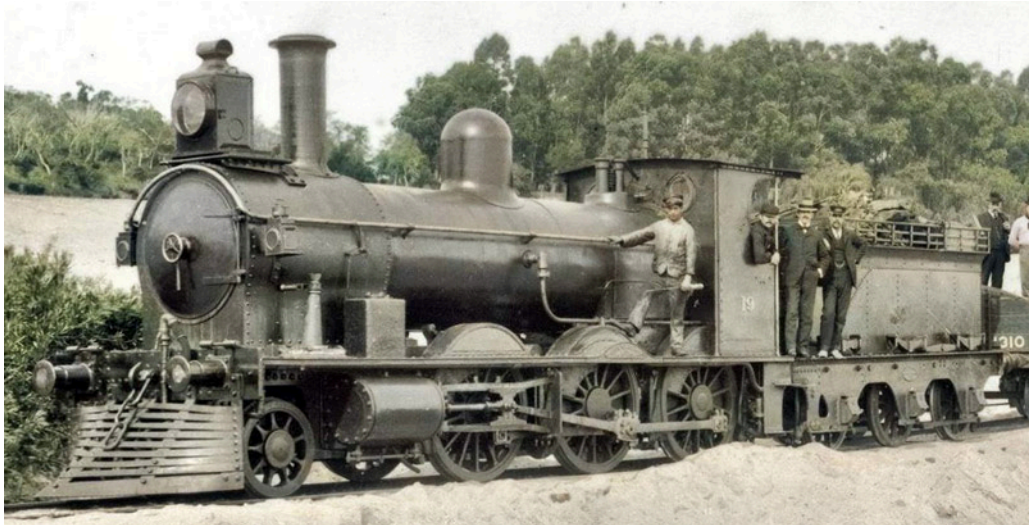
19	w/n 2111	Withdrawn May 1932 and scrapped Feb 1937. Boiler completely dismantled and only barrel shell left.
20	w/n 2112	Withdrawn Nov 1938 and scrapped May 1939.
21	w/n 2113	Not listed as in service at end of 1941 [34].

All in service in 1893 [32].



A diagram of class G, by courtesy of the Restoration & Archiving Trust. Apologies for the distortion introduced when photographing their copy of the diagram book.





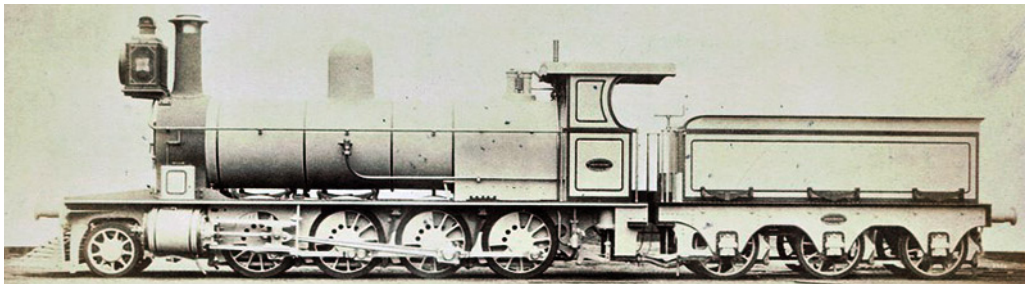
Class H

2-8-0 d/w 47", cyls. 18x24", built by Beyer Peacock in 1884

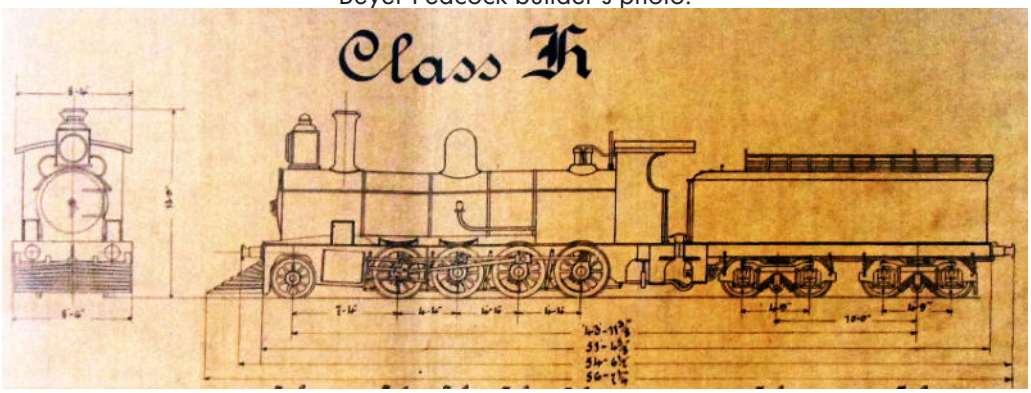
Ordered for Central Uruguay Railway. 6-wheeled tender. Originally 46" d/w? BP originally 120psi?, later 160psi? Livesey & Co. spec. book states that it was to be 150psi [45]. D/w shown as 46" in 1893 [32] and in [45]. Extended smokeboxes fitted in 1893, and replacement tenders provided in 1909-10 [25]. Fitted with superheaters in mid 1920s.

22	w/n 2512	Converted to oil burning at unknown date. In fleet at end of 1941 [34]. Reconstructed to class H-1 in May 1944.
23	w/n 2513	Converted to oil burning 1923-4. Rebuilt into Class W 2-8-2T in Oct 1941 using boiler ex class R no. 110. In fleet at end of 1941 [34].
24	w/n 2514	Converted to oil burning 1924. In fleet at end of 1941 [34]. Reconstructed to class H-1 in June 1943.

See below for the 1940s rebuilds to classes W and H-1.



Beyer Peacock builder's photo.



A diagram of class H, by courtesy of the Restoration & Archiving Trust.
You will note the bogie tender and the extended smokebox introduced
during the lives of these locos.

Loco numbers in 1886 and 1887

The report of the Directors to the Shareholders for the year ending 30th June 1888 reported that there had been 21 engines in the fleet both on the 30th June 1886 and a year later. As the total number of locos listed above is twenty-four, then three must have been withdrawn by that time, either temporarily or permanently. One of them was very probably double Fairlie no. **15**.

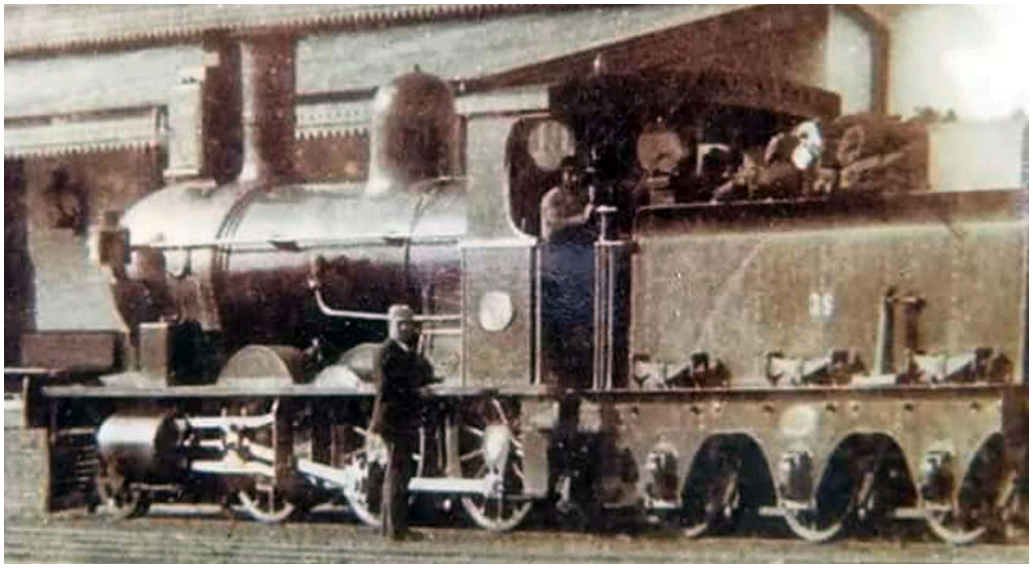
Class G-1

2-6-0 d/w 54", cyls. 16½x24", built by Beyer Peacock in 1888 (25-6, 37), 1889 (28-33) and 1887 (34-7)

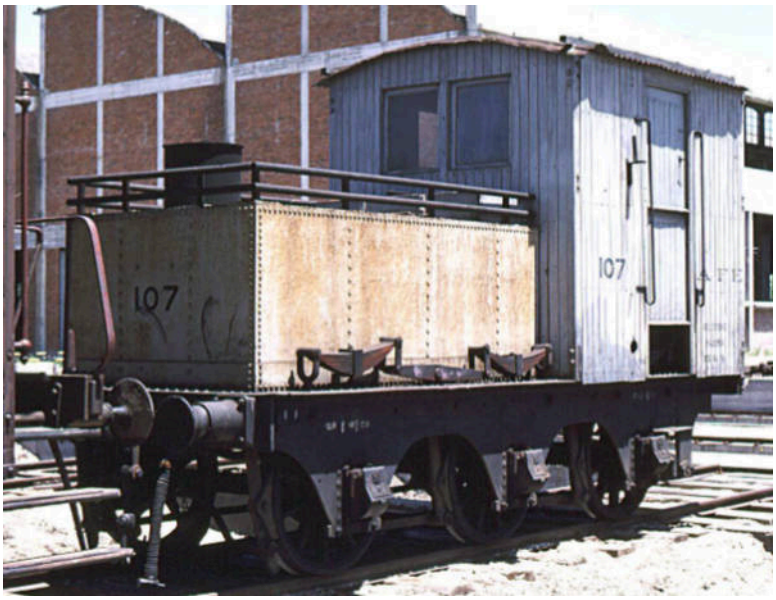
Ordered for Central Uruguay Railway (**25-30**), and for CUR Northern Extension Railway (**32-33**). **34-37** ex North Eastern Railway. One list from Dewhurst says **28-30** were from Northern Extension Railway, as does source [32] from 1893. Source [32] from 1893 shows nos. **32-33** as class G-2 compounds, and gives cyl. diams as 17 and 25". BP 120 psi. Locos **28-33** still in service in 1941 were shown in the fleet list at the end of that year as class G rather than G-1 [34]. A letter from Dewhurst to John Poole in 1940 explicitly says that the ex-NER engines had a different cab from the others.

25	w/n 2996	Replacement cyls. fitted 16x24". Not listed as in service at end of 1941 [34].
26	w/n 2997	Replacement cyls. fitted 16x24". Withdrawn July 1931, and scrapped May 1935. Tender given to loco **47** and boiler given to loco **56**.
28	w/n 3030	Replacement cyls. fitted 16x24". In fleet at end of 1941 [34].
29	w/n 3031	Replacement cyls. fitted 16x24". In fleet at end of 1941 [34].
30	w/n 3032	Replacement cyls. fitted 16x24". In fleet at end of 1941 [34].
32	w/n 3034	Replacement cyls. fitted 16x24". In fleet at end of 1941 [34].
33	w/n 3035	Replacement cyls. fitted 16x24". In fleet at end of 1941 [34].
34	w/n 2916	Withdrawn Feb 1936 and scrapped Feb 1937. Boiler completely dismantled and only barrel shell left.

35	w/n 2917	Withdrawn April 1937 and scrapped June 1937. Boiler deposited in shop yard but not repaired at time of recording in 1938. Coupled wheels fitted to loco **68**. Tender to engine **47**.
36	w/n 2918	Sold to *FC del Estado de Argentina* in February 1930 [PCD letter to John Poole, April 2nd 1940]. Their class U.
37	w/n 2943	Sold to *FC del Estado de Argentina* in February 1930 [PCD letter to John Poole, April 2nd 1940]. Their class U.



The number on the tender appears to be **31**.



Old Beyer Peacock tenders seem to have found a number of other uses once their locomotives had been scrapped.

Class G-2

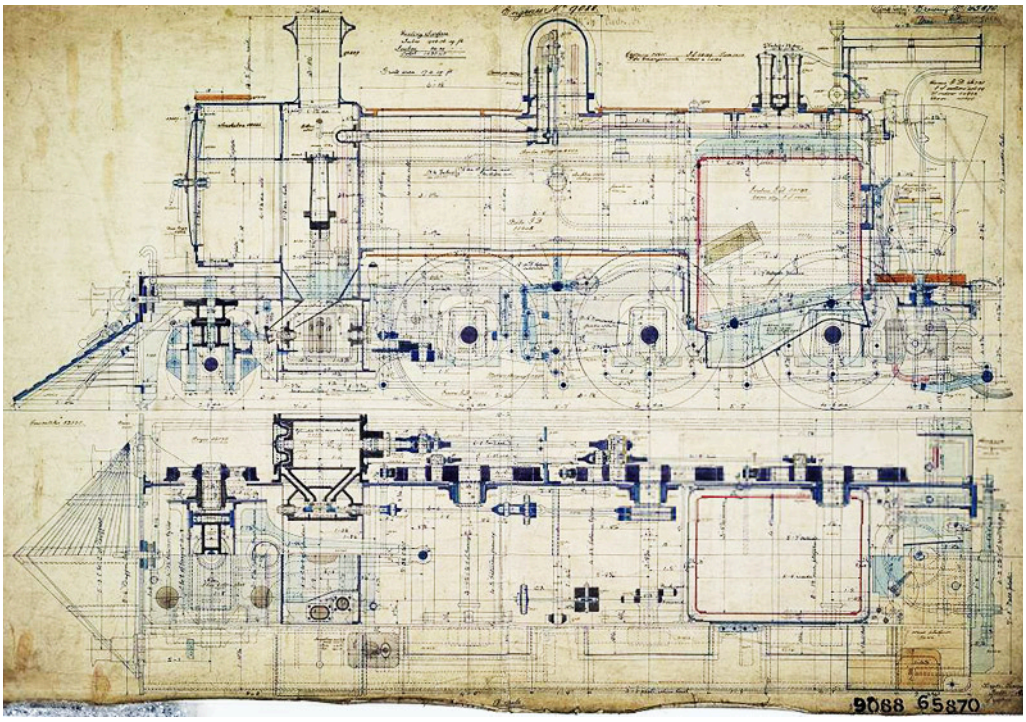
2-6-0 d/w 54", cyls. 17½/25x24", built by Beyer Peacock in 1889

Ordered for Central Uruguay Railway (**27**), and for CUR Northern Extension Railway (**31**). Dewhurst says identical to class G but have double bogie tenders as for class C. One 1930 list from Dewhurst has not only **27** and **31** as class G-2 but also nos. **32** and **33**. That same list says 6 wheel tenders for these engines too.

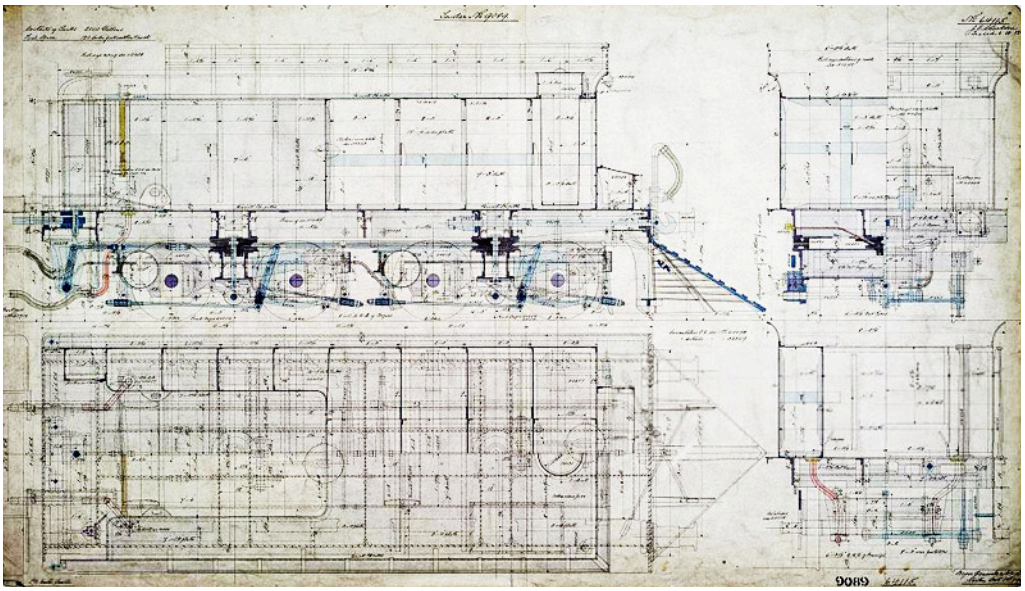
27	w/n 2998	Replacement cyls. fitted 17½x24". Withdrawn July 1935 and scrapped Feb 1937. Boiler completely dismantled and

		only barrel shell left.
31	w/n 3033	Replacement cyls. fitted 17½x24". In fleet at end of 1941 [34].

Dewhurst in [10] suggest that nos. **31-33** were all originally compounds.



It is not clear whether these drawings originate from the builder or from Peñarol works. They certainly resemble others from Gorton Foundry though there is no single conclusive identifying feature. The bogie tender suggests that the loco may be a class G-2 2-6-0.



Class D-2

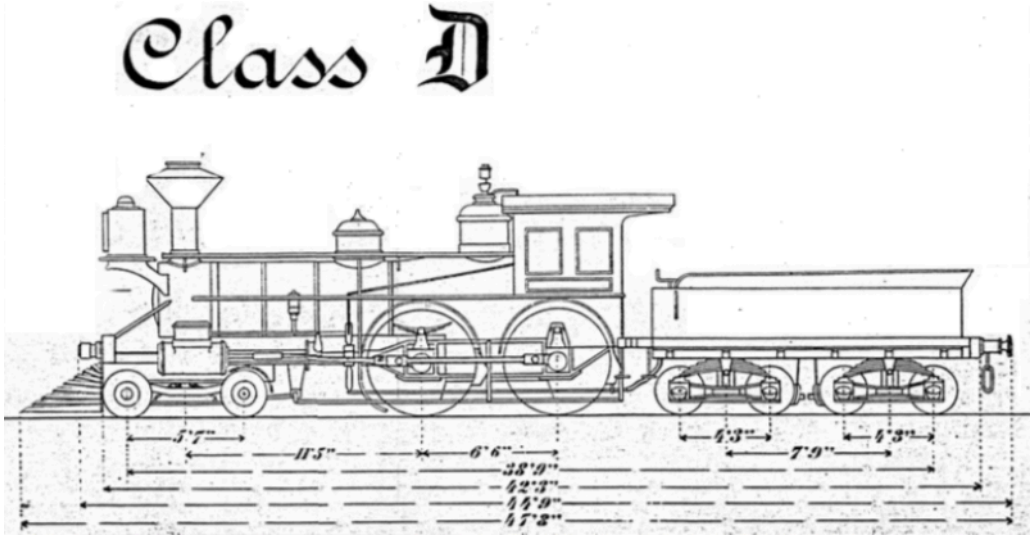
4-4-0 d/w 63", cyls. 12x24", built by Taunton in 1873

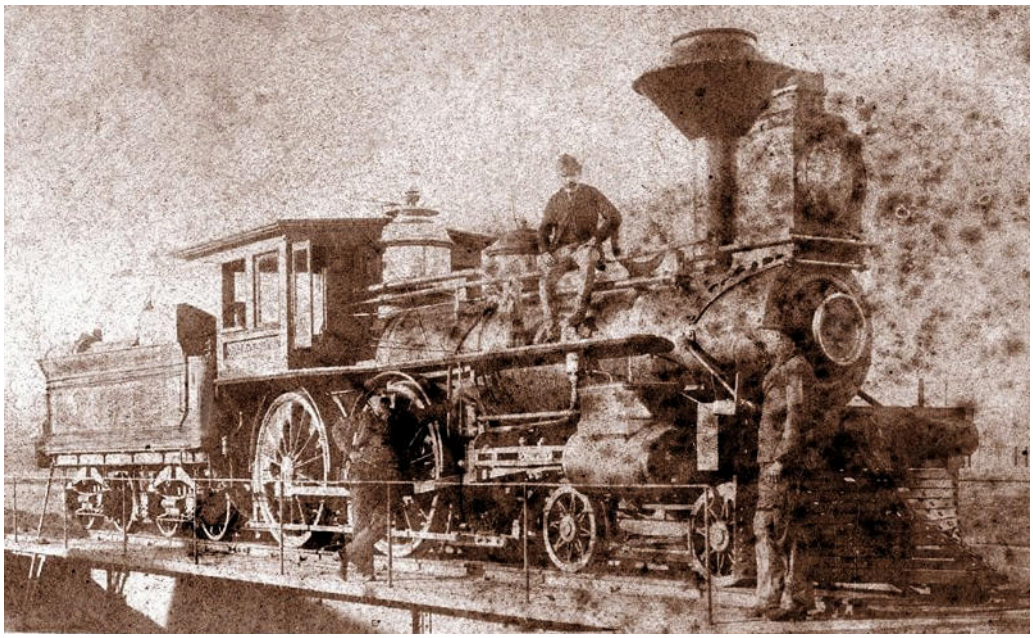
Ordered for the North Eastern Railway but [17] says they never worked there and came straight to the CUR in 1889. Dewhurst records builders numbers as 630 for loco **38**, and 629 for loco **40**. Source [32] says the same, and gives cyls. as 14x24". Dewhurst also implies that they came from B. Hale & Co. but gives no details of what that company was.

38	w/n 628	Originally NER no. **3 'MAROÑAS'**. Sold to La Plata tramway in Argentina in 1901 [17]. No. reused in 1913.
39	w/n 630	Originally NER no. **4 'MALDONADO'**. Withdrawn some

		time between 1900 and 1913. No. reused in 1913.
40	w/n 631	Originally NER no. **5 'La UNION'**. Withdrawn sometime between 1900 and 1913. No. reused in 1913.
41	w/n 629	Originally NER no. **6 'URUGUAY'** later **'CLEMENTINA'**. Sold to La Plata tramway in Argentina in 1901 [17]. Number reused in 1913.

All in service in 1893 [32].





One of the four class D-2 Taunton 4-4-0s on a turntable somewhere.

This picture, dated 24th January 1930, shows **'CLEMENTINA'** lying out of use at the end of her latter-day career transferring loads between La Plata city in Argentina and the nearby slaughterhouses of Abasto. The photo was found on the *La Plata Magica* website by Sr. Leonardo San Martin Ojeda. Note that the original built-up leading wheels with split spokes have been replaced by sold wheels. The latter were favoured on the River Plate as being more robust in case of derailment.

Class I (though a 1930 list says class J)

4-4-0 d/w 54", cyls. 12x22", built by Taunton in 1872

Came from Nordeste railway according to PCD and [32], and may only have been integrated into CUR numbering scheme in 1894 [17] though [32] from 1893 has them as nos. **15-16**. BP 120psi. One Dewhurst list gives cyls. as 12x24". Bogie tender. Source [32] has works numbers the other way round, and cylinder stroke as 24".

15[2]	w/n 592	Ex *Nordeste* **'PANDE'**.) One withdrawn 1906-7 and the
16[2]	w/n 594	Ex *Nordeste* **'MINAS'**) other around 1915.

Class A

0-6-0T d/w 42", cyls. 13x17", built by Manning Wardle in 1888

Ordered for the North Eastern Railway. Dewhurst records cyls. as 11x17" and in another list as 11x18" [32]. [21] points out that surprisingly the new plates cast by the CUR showing the no. **42A** nevertheless bore the words *FC Nord-Este del Uruguay,* and that this may well have been an accounting issue. In service 1893 [32].

42[1]	w/n 1045	Later renumbered **42A** in 1913 when the class D 4-4-4Ts arrived and reused the number **42**. Another MW loco (1197) was brought from Puerto Sauce where it had been stored since 1910. It was then combined with **42A** in Feb 1938. The old boiler of **42A** was deposited in shop yard. In fleet at end of 1941 [34]. Loco survives, at the Sudriers workshops, and later moved to Peñarol diesel workshops.

Class A

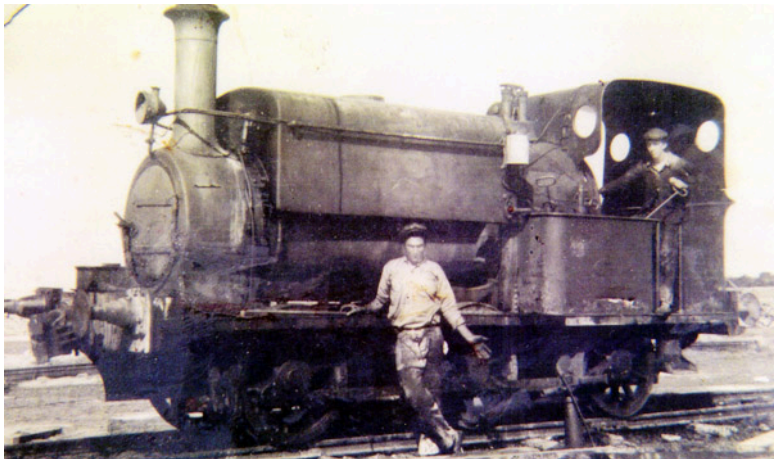
0-6-0T d/w 42", cyls. 11x17", built by Manning Wardle in 1889

Ordered for the CUR Northern Extension Railway. Cylinders shown in a 1930 list as 11x18".

43[1]	w/n 1148	Originally CUR Northern Extension railway no. **E 7 N** (?). Not in 1941 fleet list [34].

44	w/n 1149	Originally CUR Northern Extension railway no. **E 8 N** (?). Scrapped by 1925.

Both in service 1893 [32].

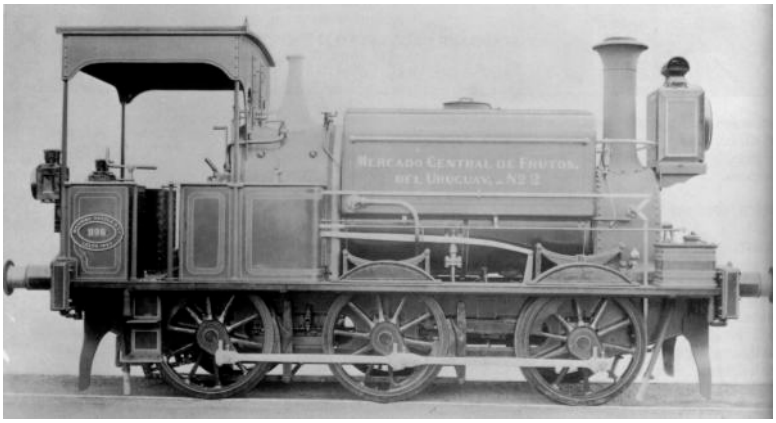


This loco has the small splashers, like that pictured a few pages back masquerading as **'GENERAL FLORES'**. This suggests that that imposter was in fact one of these 1888-9 locos dressed up for some national celebration of its namesake.

0-6-0T d/w 42", cyls. 11x17", built by Manning Wardle in 1890

Ordered for CUR, Montevideo via BsAs. Fitted with vacuum brakes. MW type: Special. Despatched 22/09/1890 and 22/10/1890.

1[2]	w/n 1197	Not in 1941 fleet list [34].
2[2]	w/n 1198	Later worked for *ANP* at Montevideo port.



MW no. 1198 as delivered bearing the lettering **'MERCADO CENTRAL de FRUTOS DEL URUGUAY No. 2'** on its tank. The photo is via Fred Harman's *The Locomotives built by Manning Wardle & Co. Volume 2 Standard Gauge*. [7].

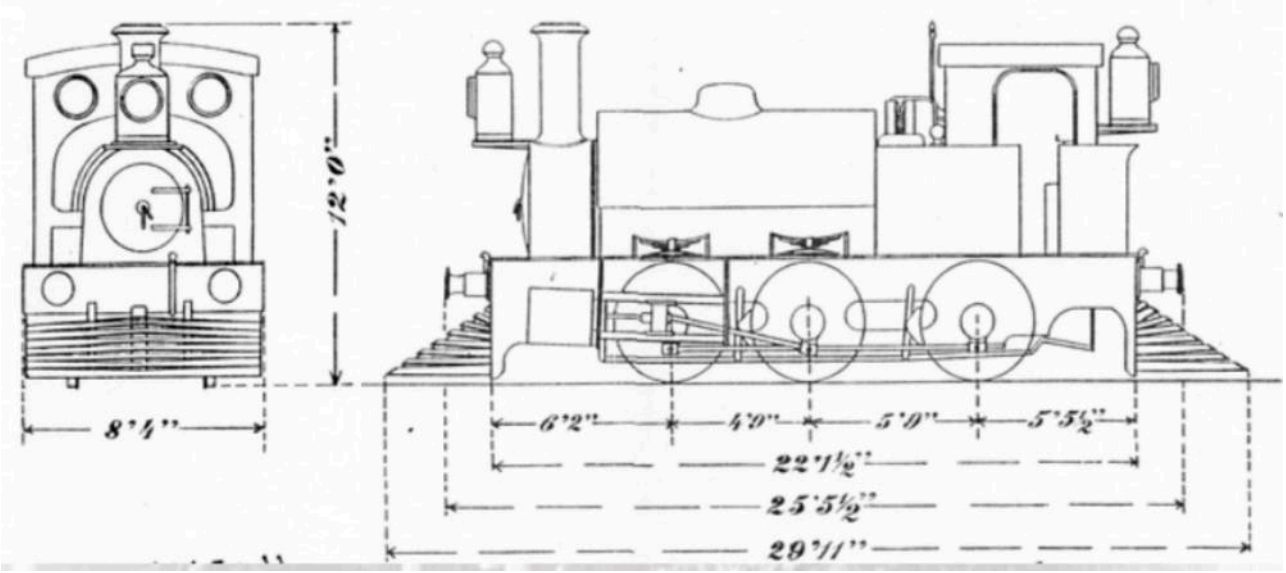
Class K

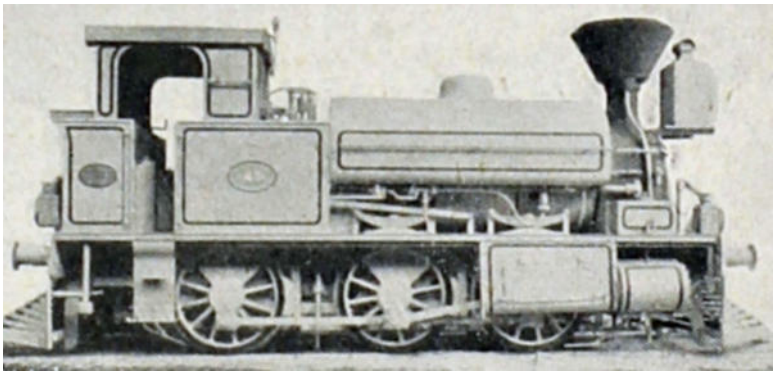
0-6-0T d/w 48", cyls. 14x20", built by Robert Stephenson in 1891

Ordered for CUR. The number plates carried later were apparently lettered as if for the CUR Northern Extension Railway. BP 150psi. These locos were never converted to burn oil. They were originally used between Peñarol workshops and Montevideo but in 1912 were moved to the Northern Extension Railway where they remained until sold.

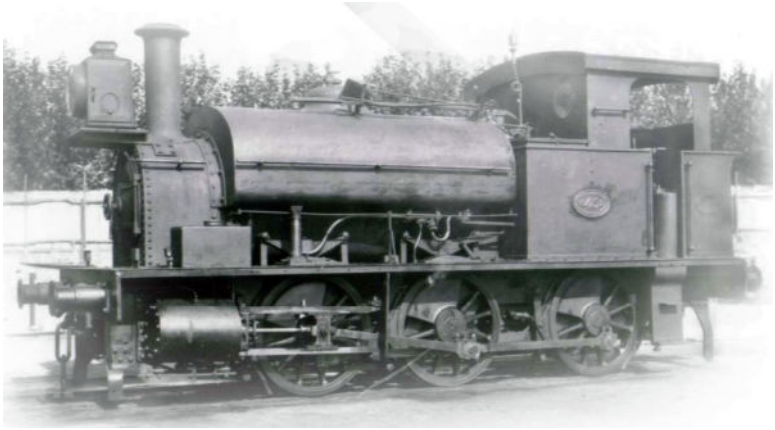
45	w/n 2711	Sold 1930-1, to the *Cía. Franco-Uruguaya de Obras Públicas*.
46	w/n 2712	Sold 1930-1, to the *Cía. Franco-Uruguaya de Obras Públicas*.

Both were sold on in 1935 to the *Admin. Nacional de Puertos*.





A photo published in *The Railway Magazine* in October 1902.



Class C

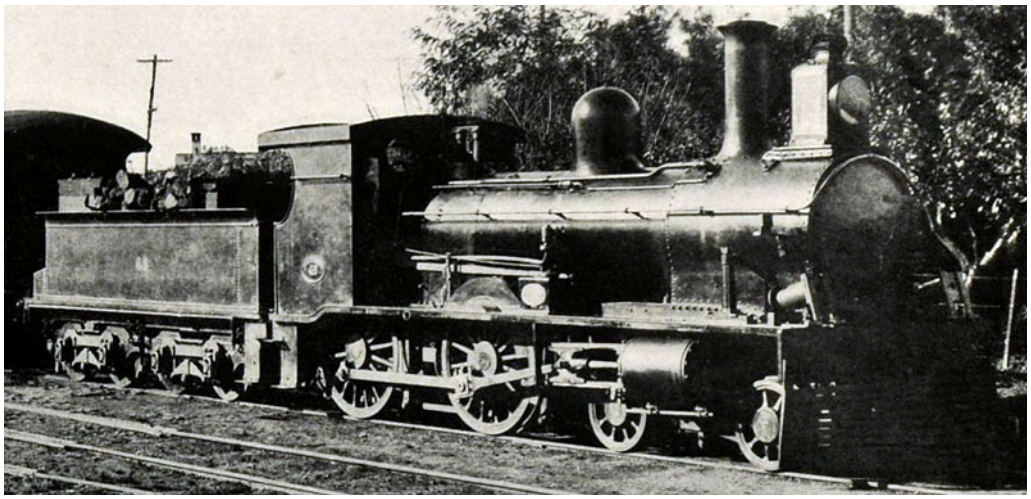
4-4-0 d/w 60", cyls. 16/23x22", built by Robert Stephenson in 1891

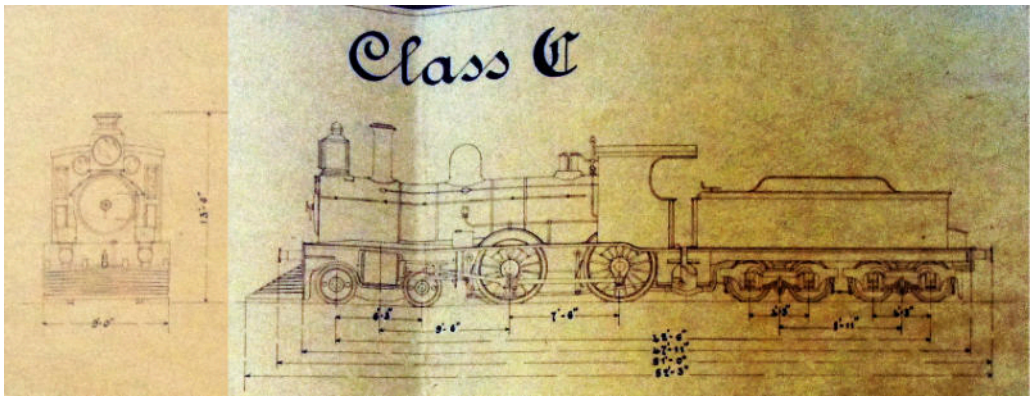
Ordered for CUR, though Dewhurst records owners of nos. **49-52** as the Eastern Extension Railway, as does source [32]. Bogie tender. b/p 170lbs.

47	w/n 2705	Rebuilt as simple with cyls. 16x22". Received tender from scrapped loco **26** early in 1930s but then it was replaced by tender from loco **35** in July 1937. In fleet at end of 1941[34].
48	w/n 2706	Rebuilt as simple with cyls. 16x22". Scrapped prior to 1941 [34].
49	w/n 2707	Rebuilt as simple with cyls. 16x22". In fleet at end of 1941 [34].
50	w/n 2708	Rebuilt as simple with cyls. 16x22". Scrapped prior to 1941

		[34].
51	w/n 2709	Rebuilt as simple with cyls. 16x22". In service end of 1941 [34].
52	w/n 2710	Rebuilt as simple with cyls. 16x22". In service end of 1941 [34].

All in service as compounds in 1893 [32].





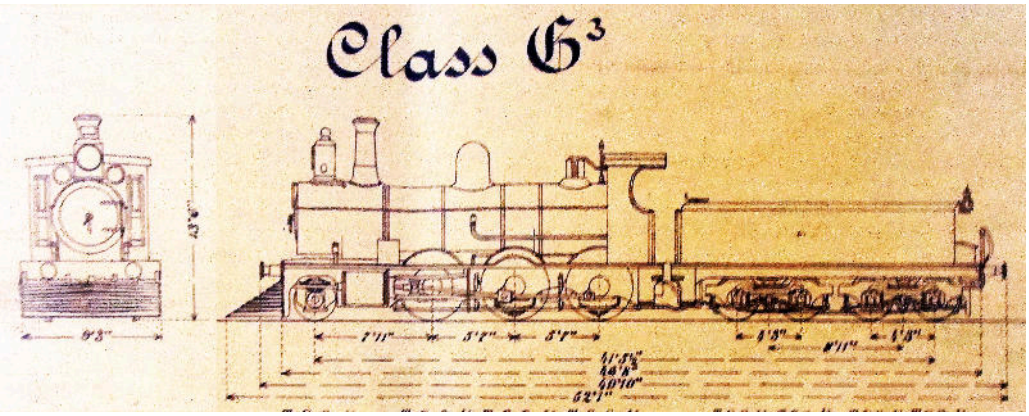
A diagram of class C, by courtesy of the Restoration & Archiving Trust. Apologies for the distortion introduced when photographing their copy of the diagram book.

Class G-3

2-6-0 d/w 54", cyls. 17½/25x24", built by Robert Stephenson in 1891

Ordered for CUR *Extension Este*. Dewhurst records these locos as 0-6-0 but that might be a mistake, as another list in his archive has them as 2-6-0s. One list from Dewhurst confirms these were actually 2-6-0s and mentions that they had bogie tenders. It also says that these four locos came from the Eastern Extension Railway. BP 170psi. In the fleet list or the end of 1941 these locos were shown as class G1 rather than G3 [34].

53	w/n 2701	Rebuilt as simple with cyls. 17x24". In fleet at end of 1941 [34].
54	w/n 2702	Rebuilt as simple with cyls. 17x24". In fleet at end of 1941 [34].
55	w/n 2703	Rebuilt as simple with cyls. 17x24". In fleet at end of 1941 [34].
56	w/n 2704	Rebuilt as simple with cyls. 17x24". In fleet at end of 1941 [34].



A diagram of class G3, by courtesy of the Restoration & Archiving Trust.

Class C

4-4-0 d/w 60", cyls. 16/23x22", built by Beyer Peacock in 1891

Ordered for Bogie tender, b/p 170 lbs.

57	w/n 3295	Rebuilt as simple with cyls. 16x22". Scrapped prior to 1941 [34].
58	w/n 3296	Rebuilt as simple with cyls. 16x22". In fleet at end of 1941 [34]. Rebuilt with larger boiler as class C-2 in Dec 1942.
59	w/n 3297	Rebuilt as simple with cyls. 16x22". In fleet at end of 1941 [34]. Rebuilt with larger boiler as class C-2 in April 1944.
60	w/n 3298	Rebuilt as simple with cyls. 16x22". In fleet at end of 1941 [34]. Rebuilt with larger boiler as class C-2 in Feb 1944.
61	w/n 3299	Rebuilt as simple with cyls. 16x22". In fleet at end of 1941 [34]. Rebuilt with larger boiler as class C-2 in April 1944.
62	w/n 3300	Rebuilt as simple with cyls. 16x22". Scrapped pror to 1941 [34].

All in service as compounds in 1893 [32].

The fleet in the mid-1890s

The government volumes of statistics for 1893 and 1895 state that the CUR (including the Extensións Norte, Nordeste y Minas), had 63 locomotives in its fleet during those years. However, the company's annual report to shareholders for 1894 gives the total number of locos as 47, rising to 52 in 1895. The loco stock in mid-1896 is more precisely specified: as eight 4-coupled mixed traffic engines, sixteen 6-coupled goods engines (down from seventeen the previous year), three 8-coupled goods engines, sixteen 4-coupled passenger locos, two passenger express engines both withdrawn by 1896, five shunting engines rising to six in 1896, and finally one Fairlie locomotive in 1895 that had been withdrawn by 1896. By the end of that year the first five L class engines listed below had entered service, and during 1897 two heavy 6-coupled shunting locos had been purchased from the Northern Railway whilst the old small no. **2** shunting loco had been sold for £600.

Figures for mid-1898, also in the report to shareholders at that point, include: eight C class 4-coupled compound mixed traffic locos, one G class 6-coupled compound goods engines, nine G class 6-coupled simple goods engines, ten L class 6-coupled simple goods engines, three class H 8-coupled simple goods locos, ten light E and F class 4-coupled simple passenger engines, four D class American 4-coupled passenger locos (should be class O?), two I class American 4-coupled passenger locos (should be class P?), three small shunting engines of classes A and A1, decreased from four owing to sale of loco no. **2**, four large shunting engines of classes H and K increased from two owing to purchase of two from Northern Railway. The 1899 stats. were identical.

Class L

2-6-0 d/w 54", cyls. 17½x24", built by Beyer Peacock in 1895 (63-7), 1896 (68-72) and 1900 (73-8)

Ordered for Nos. **63** and **64** may have had cyls. 17x24".

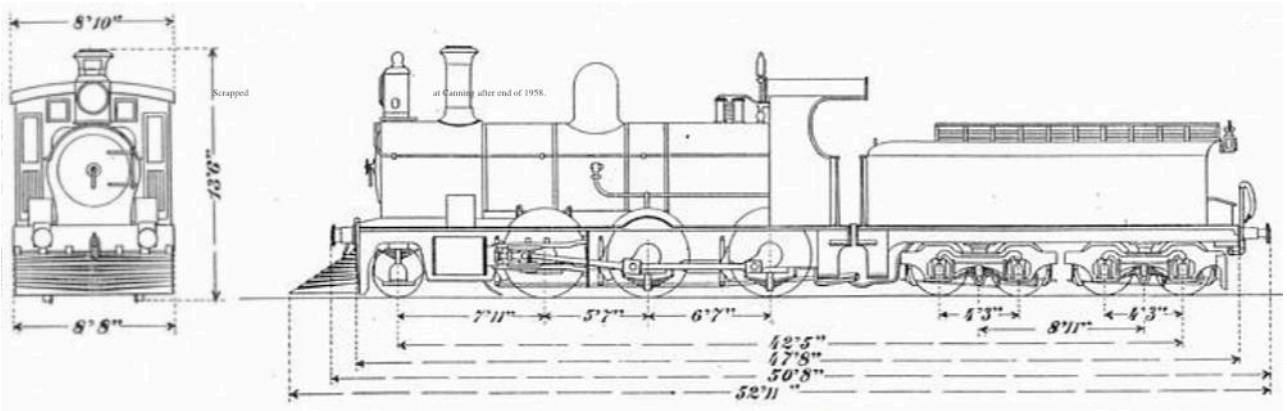
63	w/n 3627	In fleet at end of 1941 [34]. Withdrawn 1945.
64	w/n 3628	In fleet at end of 1941 [34]. Withdrawn Dec. 31 1961. Scrapped at Canning, 1969-70.
65	w/n 3634	In fleet at end of 1941 [34]. Withdrawn 1954. Scrapped at Km. 18 after end of 1958.
66	w/n 3635	In fleet at end of 1941 [34]. Withdrawn before 1950. Scrapped at Km. 18 after end of 1958.
67	w/n 3636	In fleet at end of 1941 [34]. Derailed and overturned at some point. Allocated to PW use from 1943 involving modifications to fit ditch ploughing equipment [40] (NB Not no. **66** as text states). Later returned to normal use. Withdrawn formally Dec. 31 1963, though probably out of use long before that. Abandoned in scrapline at Carnelli.
68	w/n 3861	In fleet at end of 1941 [34]. Involved in the Berrondo collision in May 1927. Seriously damaged but returned to service using parts from no. **71** which had been withdrawn after the same accident [9 & 34]. Received coupled wheels from scrapped loco **35** in 1937. Operating on Rosario to Pto. del Sauce branch for some time in 1940s. Withdrawn August 1954. Source [40] comments: *Retirada del Inventario el día 27 de agosto de 1954. Necesita reparación y tiene una tapa de cilindro rota, puede ser usada. Sin tanque de petróleo. Abandonada en Estación Canning.* Scrapped at Canning, after end of 1958.
69	w/n 3862	In fleet at end of 1941 [34]. Withdrawn 27th August 1954. Used after withdrawal as a stationary boiler at Paysandu, until about 1979.
70	w/n 3863	In fleet at end of 1941 [34]. Withdrawn 1946.
71	w/n 3864	Destroyed in Berrondo collision 1927 [1]. Parts used to help rebuild no. **68** which had been seriously damaged in the same accident [9]. Tender still exists.
72	w/n 3865	In fleet at end of 1941 [34]. Withdrawn Feb. 7 1957. Scrapped at Canning between 1969-70.
73	w/n 4201	In fleet at end of 1941 [34]. Operating on Rosario to Pto. del Sauce branch for some time in 1940s. Source [40] comments: *Retirada del Inventario el día 10 de noviembre de 1955. Necesita reparación y cambiar o reparar, cilindro de vapor derecho. Abandonada en Estación Canning.* Scrapped at Canning after end of 1958.
74	w/n 4202	Sold to *FTE* 1940 [34], and became no. **18**. Withdrawn 27th August 1954. Scrapped at Canning after end of 1958.
75	w/n 4203	In fleet at end of 1941 [34]. Operating on Rosario to Pto. del Sauce branch for some time in 1940s. Source [40] comments: *Retirada del Inventario el día 27 de agosto de 1954. Necesita reparación general. Sin tanque de petróleo.*

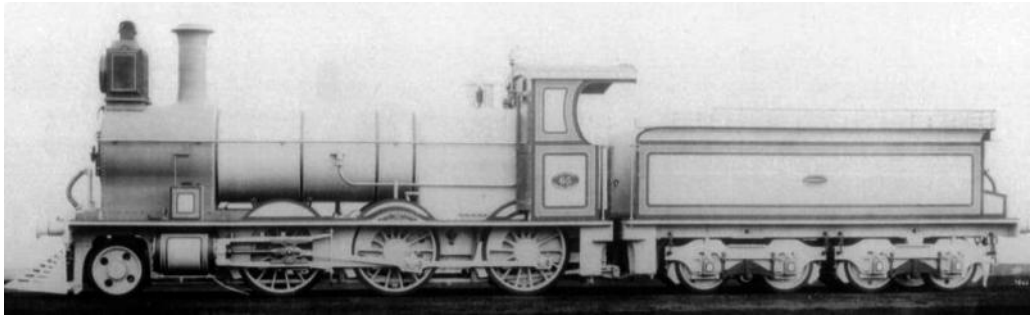
Abandonada en Estación Canning. Scrapped at Canning after end of 1958.

76 w/n 4204 In fleet at end of 1941 [34]. Withdrawn 7th Feb. 1957. Used after withdrawal as a stationary boiler at Salto workshops. Scrapped there in 1980s.

77 w/n 4205 In fleet at end of 1941 [34]. Operating on Rosario to Pto. del Sauce branch for some time in 1940s. Source [40] comments: *Retirada del Inventario el día 27 de agosto de 1954. Necesita reparación general y cambio de la caja de fuego. Abandonada en Estación Canning.* Scrapped at Canning after end of 1958.

78 w/n 4206 In fleet at end of 1941 [34]. Operating on Rosario to Pto. del Sauce branch for some time in 1940s. Source [40] comments: *Retirada del Inventario el día 11 de noviembre de 1955. Necesita reparación general y cambiar eje trasero por estar fino. Abandonada en Estación Canning.* Scrapped at Canning after end of 1958.





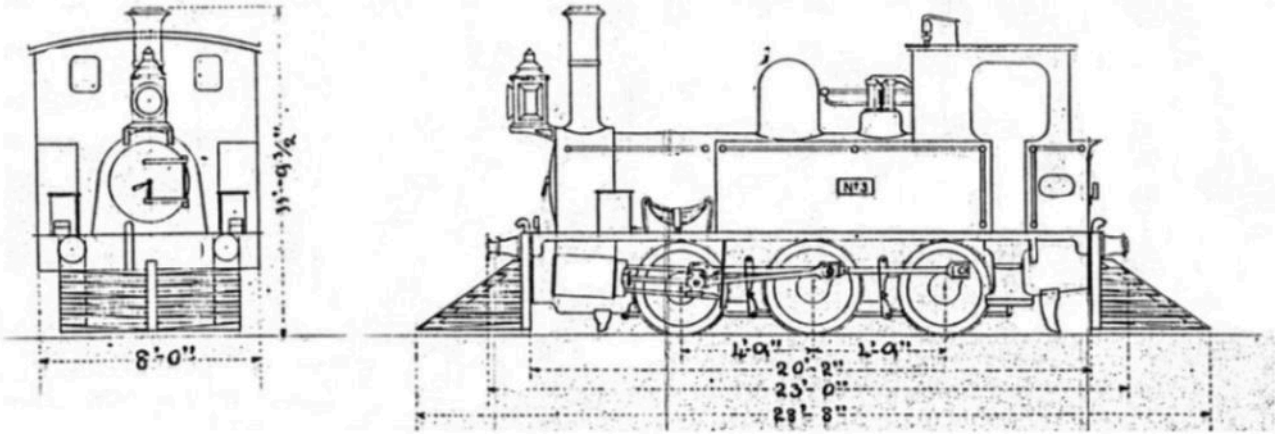
Class A-1

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

Ex Uruguay Midland Railway no. **2 'DAYMAN'**. May have arrived on CUR in 1899.

3[2] w/n 923 In service in 1952, but withdrawn possibly 1954, and formally removed from fleet list in 1956 [17]. However, it was not scrapped and was returned to service in the 1970s when there was a desperate shortage of power. Finally withdrawn in 1975. Most recently recorded plinthed at Piedra Alta.

Class A'

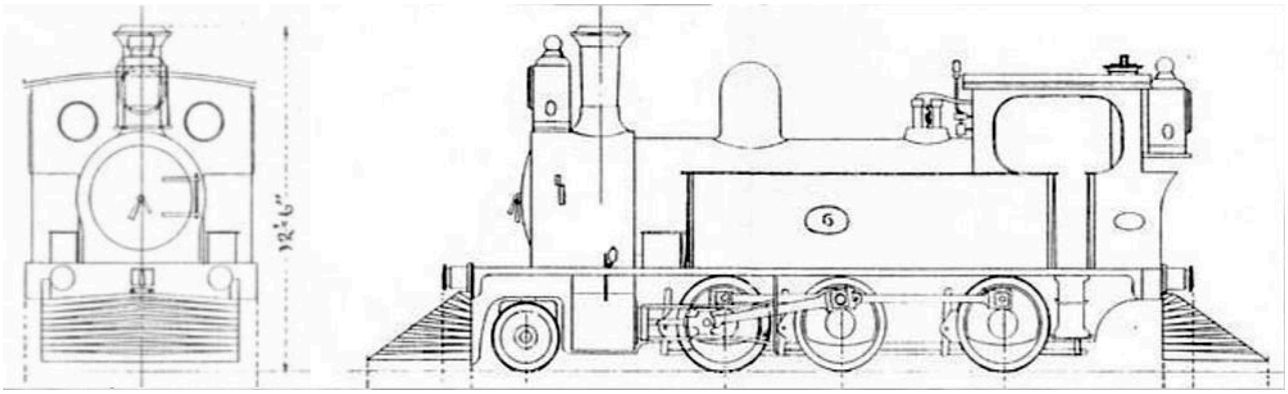


Class B

2-6-0T d/w 40", cyls. 15x20", built by Falcon in 1890

Ex Uruguay Northern Railway nos. **3** and **4**, purchased apparently in 1897. Valves and valve gear inside.

6[2]	w/n 179	Converted to oil-burning in 1925-6. Received boiler from scrapped no. **7** in Nov. 1935. Withdrawn Aug 1937 and sold to *frigorífico* Armour in Sept 1937.
7[2]	w/n 180	Converted to oil-burning in early 1931. Withdrawn and scrapped Nov. 1935. Boiler put on loco no. **6**. Old no. **6** boiler scrapped.

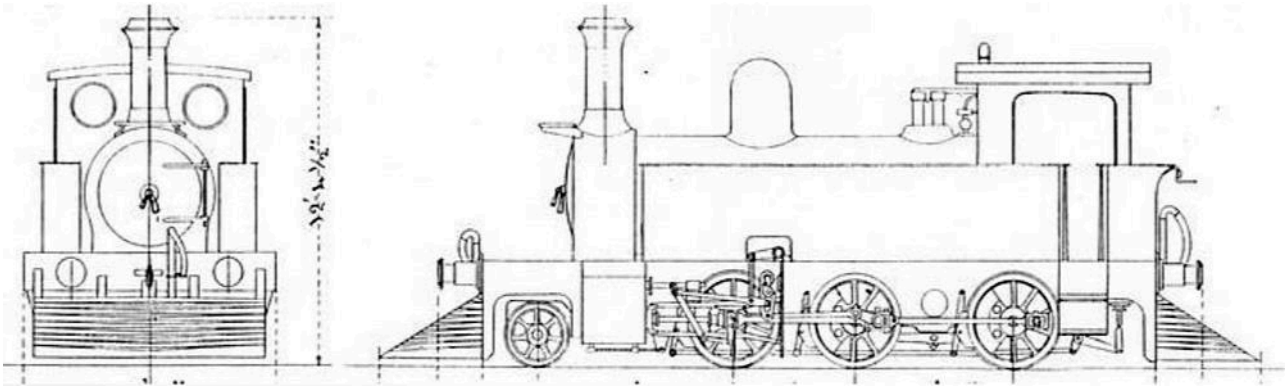


Class B-1

2-6-0T d/w 40", cyls. 15x20", built by Beyer Peacock in 1889

Ex Midland of Uruguay no. **8**. Valves and valve gear outside. May have arrived 1899.

4[2]	w/n 3011	Converted to oil-burning in late 1923. In fleet at end of 1941 [34]. Still in service in November 1988. Withdrawn 1994. Plinthed at Criolla Elias Regules theme park in Montevideo.



Class O

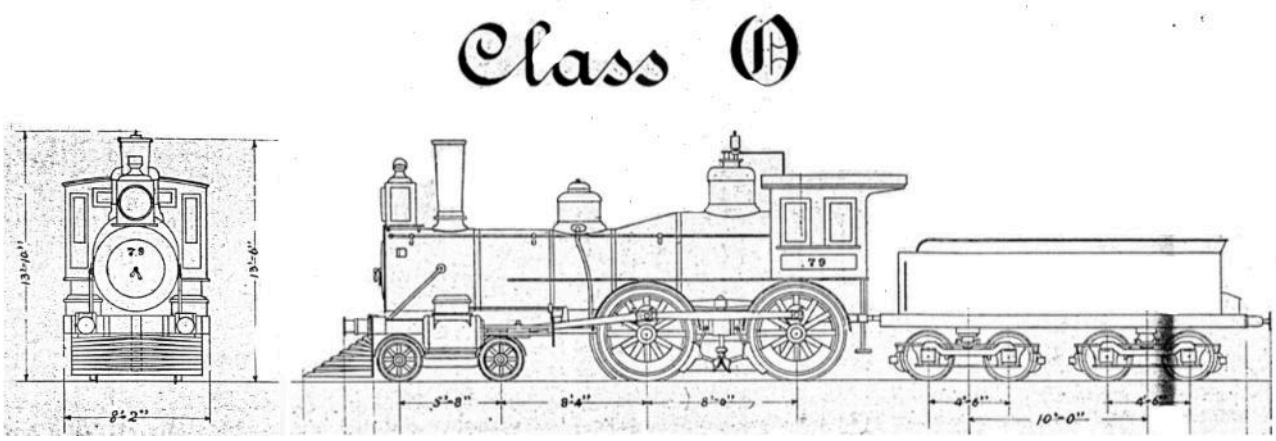
4-4-0 d/w 62", cyls. 17x24", built by Baldwin in 1890

Ordered via Olcott & Co. Class 8-28C nos. 750-755. Spec. is in vol. 15 p 185.

80	w/n 10485	Ex CUR Western Extension Railway no. **4**. No. **80** withdrawn between 1920 and 1924.
82	w/n 10486	Ex CUR Western Extension Railway no. **5**. Not in fleet at end of 1941 [34].
85	w/n 10487	Ex CUR Western Extension Railway no. **6**. No. 85 withdrawn and broken up 1930.
81	w/n 10488	Ex CUR Western Extension Railway no. **7**. Not in fleet at end of 1941 [34].
83	w/n 10489	Ex CUR Western Extension Railway no. **8**. Not in fleet at end of 1941 [34].
84	w/n 10491	Ex CUR Western Extension Railway no. **9**. Not in fleet at end of 1941 [34].

[10] has a different combination of WER numbers and the later CUR numbers, though the CUR number and builders' number matches are as above. Dewhurst seems to think that locos **79-84** were those with 17" cylinders, and gives their w/n as 10417, 10485-6, 10488-9, and 10491. Thus those with 15" cylinders were numbered **85-87** and were w/n 10411-2 and 10487. He also gives the d/w as 63". [18] gives the works numbers and WER numbers as above, but

shows the CUR running numbers as **79-84**. All out of service by 1927.



Class O had wagon-top boilers with steam dome immediately in front of the cab.

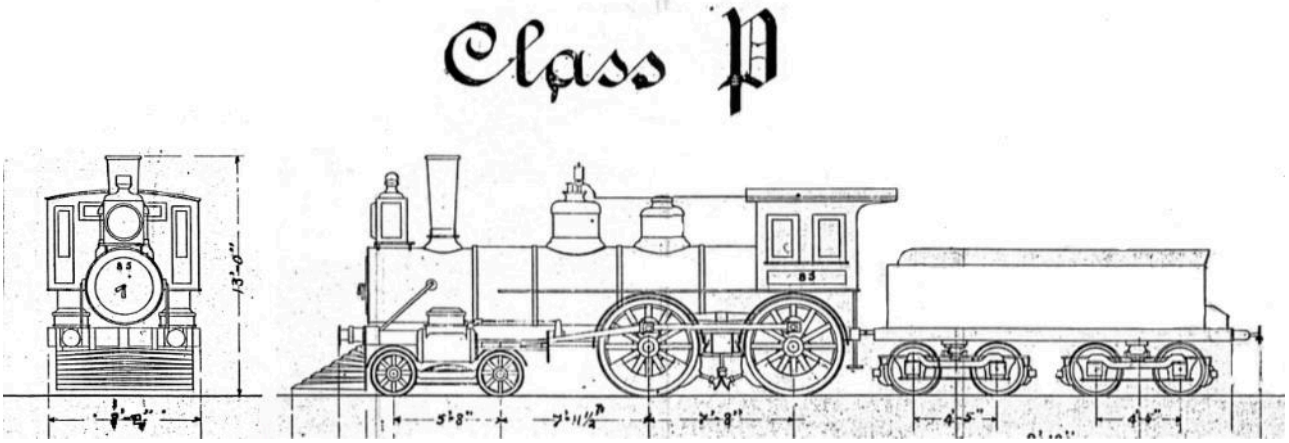
Class P

4-4-0 d/w 62", cyls. 15x24", built by Baldwin in 1890

Ordered via Olcott & Co. Class 8-24C nos. 156-158. Spec. is in vol. 15 p 197.

86	w/n 10411	Ex CUR Western Extension Railway no. **1**. Withdrawn Nov 1927. Engine and tender in Río Negro as 'stand-by' for the electric light plant. Brought to Peñarol for breaking up in Sept 1936. Boiler completely cut up. Officially scrapped Dec 1936.
87	w/n 10412	Ex CUR Western Extension Railway no. **2**. Withdrawn Jan 1926 and partially dismantled Sept 1936. Used as portable boiler with tender at running sheds until about 1931, then in Peñarol yard until Sept 1936 when sent to Central without tender to supply steam for hydraulic pumping plant. Remained there in March 1938.
79	w/n 10417	Ex CUR Western Extension Railway no. **3**. Not in fleet at end of 1941 [34].

[18] gives the works numbers and WER numbers as above, but shows the CUR running numbers as **85-87**.



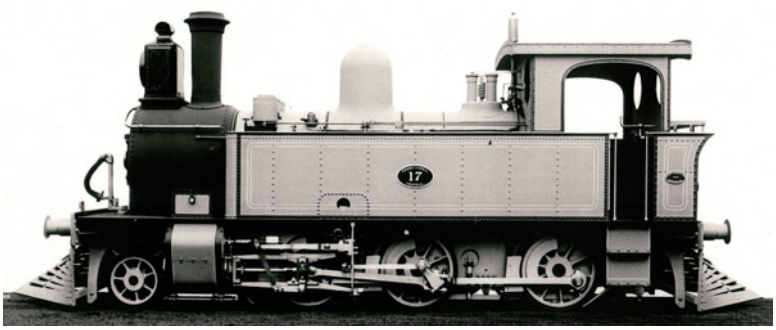
Class P on the other hand had straight top boilers with the steam dome much further forward, in fact in front of the sand dome.

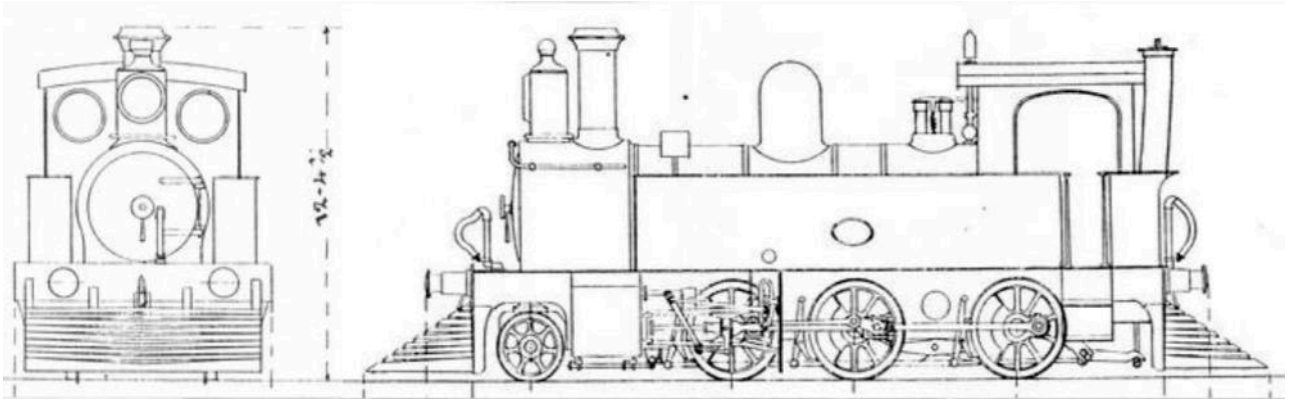
Class B-1

2-6-0T d/w 40", cyls. 15½x20", built by Beyer Peacock in 1905 and 1910

Ordered for CUR. Valves and valve gear outside.

1[2]	w/n 4744	Converted to oil-burning in 1927. In fleet at end of 1941[34]. Withdrawn 1956, abandoned at Km. 18 in 1958.
2[2]	w/n 4745	Converted to oil-burning in 1927. In fleet at end of 1941[34]. Withdrawn 1956, abandoned at Km. 18 in 1958.
17	w/n 5394	Converted to oil-burning in 1926-7. In fleet at end of 1941 [34]. Converted to burn wood for occasional use at Piedra Alta workshops. Withdrawn 2002. Survives, now at Carnelli.





This CUR diagram is applicable to the Beyer Peacock locos **1** , **2** and **17** (above), and also to the Hudswell Clarke equivalents, nos. **15** and **16** (below). Note the oil tank filler pipe behind the cab, indicating that the diagram is applicable to the locos after conversion. Also note the extended smokebox when compared with loco no. **4**, above.

1906

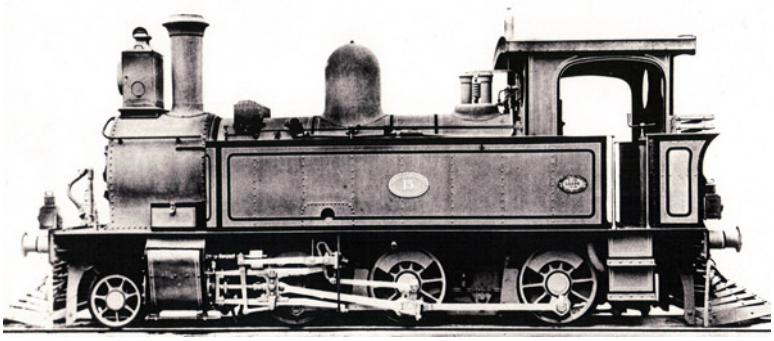
Class B-1

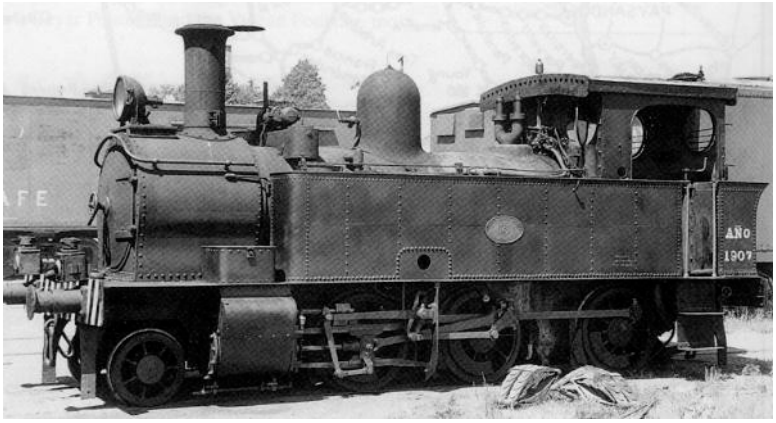
2-6-0T d/w 40", cyls. 15½x20", built by Hudswell Clarke in 1906

Ordered for CUR Eastern Extension Railway.

15[3]	w/n 778	In fleet at end of 1941 [34]. Still in service in November 1988. Retired 1995. Was lying dismantled at Peñarol

		workshops in 1998.
16[3]	w/n 779	Converted to oil-burning in 1925. In fleet at end of 1941[34]. Withdrawn 1956, abandoned at Km. 18 in 1958.





No. **15** as seen by Trevor Rowe in 1993. The safety valves have changed but other alterations are superficial such as the gaining of a turbo-generator, the loss of cow-catchers, and a lowering of the vacuum brake hose stands.

Class N, with nos. 115-122 as class N-1

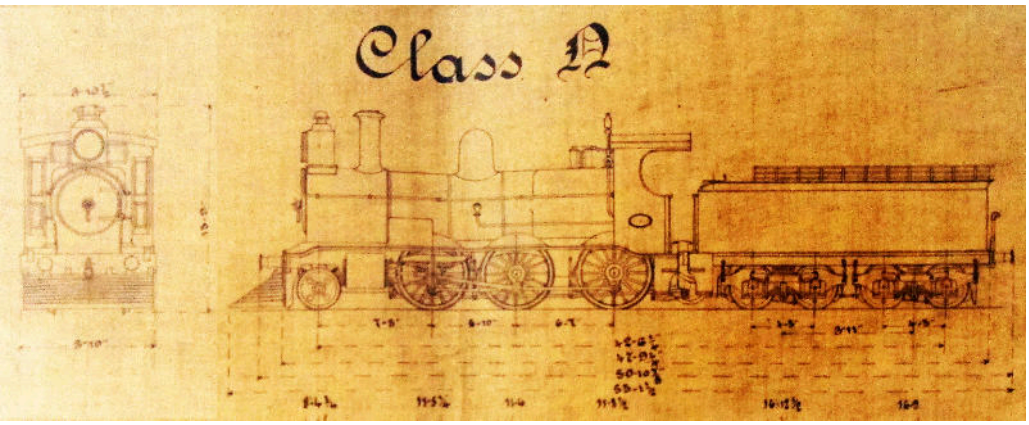
2-6-0 d/w 60", cyls. 18x24", built by Beyer Peacock in 1906 (88-93), 1907 (94-108) and 1910 (115-122)

Ordered for CUR. The 1910 batch arrived in June of that year but it took until halfway through 1911 before they had all been erected.The N-1s were regarded as faster and better suited to passenger trains. These later engines were converted to oil-burning 1921-3, and from 1936 onward they gained larger boilers with round-top fireboxes and were reclassified, the first two (Nos. **118** and **121**) as class N-2, and others with even larger boilers as N-3. These rebuilt engines received larger tenders from class R locos.

88	w/n 4746	In fleet at end of 1941 [34]. Still in service in November 1988. Survives at Paysandú but to be moved to Montevideo?
89	w/n 4747	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
90	w/n 4748	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
91	w/n 4749	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
92	w/n 4750	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. Still in service 1980s. Plinthed in park at San José.
93	w/n 4751	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. Still in service 1980s. Now plinthed at Young.
94	w/n 4941	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
95	w/n 4942	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
96	w/n 4943	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].

		Seen in service at Salto in 1969 [44]. Still in service 1980s. Plinthed in square at Artigas.
97	w/n 4944	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. In use at Rivera/ Livramento in Feb. 1969 [44].
98	w/n 4945	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. Seen June 1968 on goods from Paysandú to Paso de los Toros [44]. Seen at Rivera in Feb. 1969 but out of use by then [44].
99	w/n 4946	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
100	w/n 4947	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
101	w/n 4948	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. Survives at Peñarol 2006.
102	w/n 4949	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
103	w/n 4950	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
104	w/n 4951	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
105	w/n 4952	Superheated prior to 1941 [34]. In fleet at end of 1941 [34]. Scrapped 1992.
106	w/n 4953	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
107	w/n 4954	Superheated prior to 1941 [34]. In fleet at end of 1941 [34].
108	w/n 4955	In fleet at end of 1941 [34].
115	w/n 5395	Superheater fitted during 1916 [20]. Rebuilt as class N-3 with large boiler Sept 1940. In fleet at end of 1941 [34]. Seemingly withdrawn in early 1960s [20]. On scrap line at Bella Vista in Jan. 1968 [44].
116	w/n 5396	Superheater fitted during 1916 [20]. Rebuilt as class N-3 with large boiler April 1940. In fleet at end of 1941 [34]. Seemingly withdrawn in early 1960s [20].
117	w/n 5397	Superheater fitted during 1915 [20]. Rebuilt as class N-3 with large boiler Mar 1941. In fleet at end of 1941 [34]. Worked as stationary boiler at Paysandú until 1993. On scrap line at Bella Vista in Jan. 1968 [44]. Loco still survives at Paysandú, though dismantled.
118	w/n 5398	Rebuilt as class N-2 with large boiler Mar 1936. In fleet at end of 1941 [34]. Seemingly withdrawn in early 1960s [20].
119	w/n 5399	Superheater fitted during 1916 [20]. Rebuilt as class N-3 with large boiler June 1942. In fleet at end of 1941 [34]. Seen in Oct 1967 working pass train from Central to Cerro Colorado [44]. Given heavy repair in 1979 including fitting the cylinders that had been on class Z no. 224. Still in service in November 1988, and described as in class N-3 at that time. Used as stationary boiler at Bella Vista in early 1980s but then returned to work on coastal lines between Salto and Paysandú. Repaired at Paysandú in 1984 for use on special trains. Has run for some time carrying no. **120** plates as own plates had been sold. Declared a National Historic Monument in 1999. Currently running with tender from no. **122**. Major overhaul 2002-2005 and then regained original number **119**.

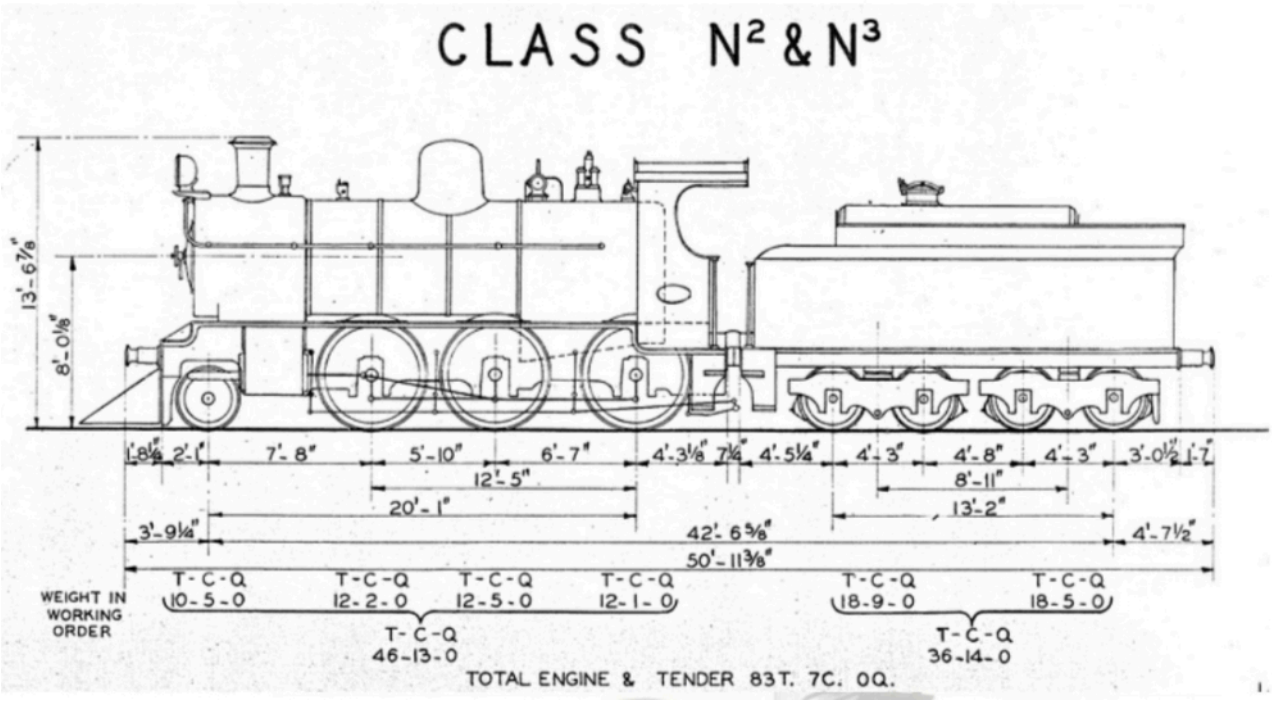
120	w/n 5400	Superheater fitted during 1914 [20]. Rebuilt as class N-3 with large boiler Jan 1942. In fleet at end of 1941 [34]. In use on PW trains in early 1980s. Still in service at Paysandú in November 1988. Moved to Paso de los Toros in 1998 for display, and 2005 to Montevideo for restoration.
121	w/n 5401	Superheater fitted during 1916 [20]. Rebuilt as class N-2 with large boiler May 1936. In fleet at end of 1941 [34]. Seemingly withdrawn in early 1960s [20].
122	w/n 5402	Superheated from new. Rebuilt as class N-3 with large boiler Jan 1942. In fleet at end of 1941 [34]. Still in use on PW trains in early 1980s, then used as stationary boiler at Bella Vista. Scrapped at Peñarol in 1996.



A diagram of class N, by courtesy of the Restoration & Archiving Trust. Apologies for the distortion introduced when photographing their copy of the diagram book.

Photo by Sr. Miguel Montelongo, found on internet. These class N locos had inside Stephenson motion.

No. 119 as rebuilt to class N-3 with a larger boiler. These later engines built as class N-1 had piston valve cylinders and outside Walschaerts valve gear fitted from new.



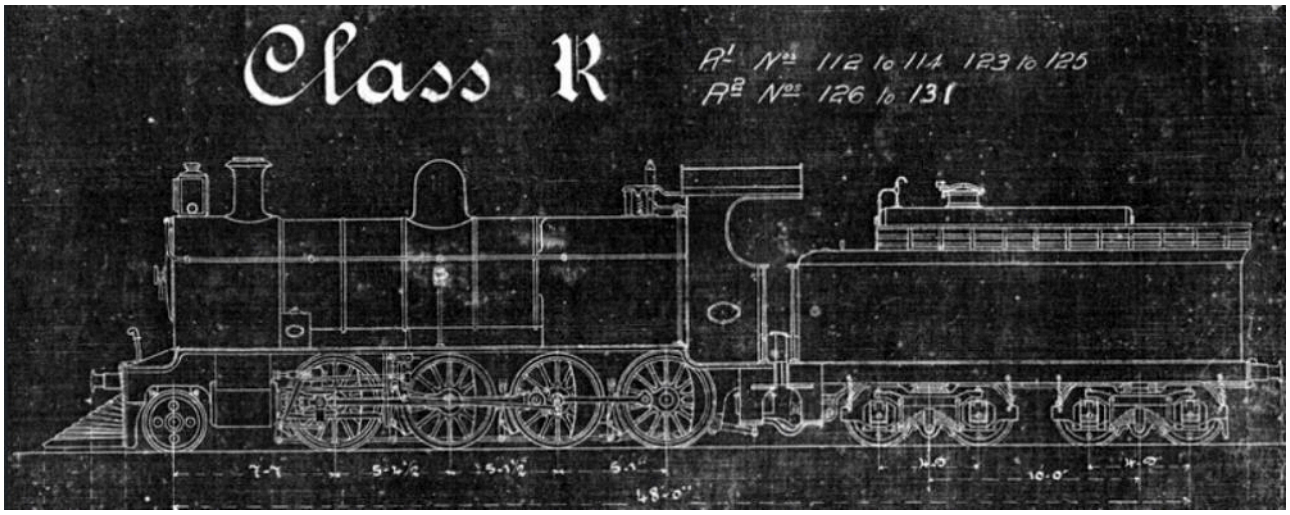
Class R, with nos. 112-113 built as class R-1, and nos. 123-131 as R-2.
2-8-0 d/w 54", cyls. 19x24", built by Beyer Peacock in 1907 (109-11), 1910 (112-14 & 123-5) and 1914 (126-31)

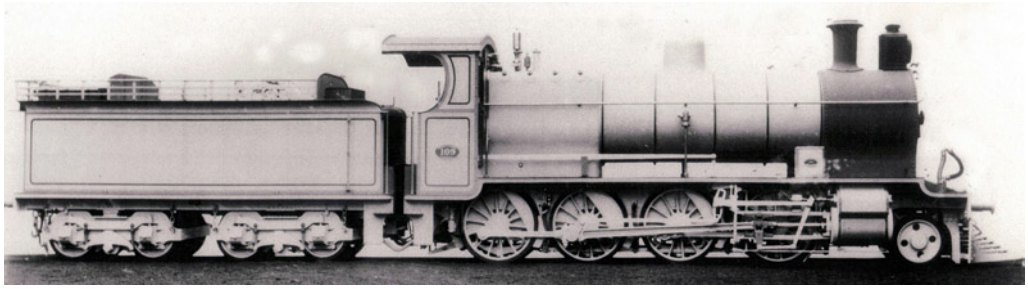
Ordered for CUR. Entire class converted to oil-burning 1923-5 [11]. Used largely on heavy freight and night passenger trains. Somewhat restricted in range owing to heavy axle-load. Some class R tenders transferred to class N locos and replaced by new tenders fitted for oil fuel from new. The 1930 fleet list has nos. **126-131** as class R-1.

109	w/n 4956	Rebuilt superheated in 1923 [11]. In fleet at end of 1941 [34]. Reconstructed to class R-4 in May 1942. OoS in Paysandú 1968, withdrawn formally in April 1969.
110	w/n 4957	Rebuilt superheated in 1921 [11]. Reconstructed to class R-4 in Sept 1940. In fleet at end of 1941 [34]. OoS in Paysandú 1968, withdrawn formally in April 1969
111	w/n 4958	Rebuilt superheated in 1918 [11]. Reconstructed to class R-4 in June 1941. In fleet at end of 1941 [34]. Withdrawn

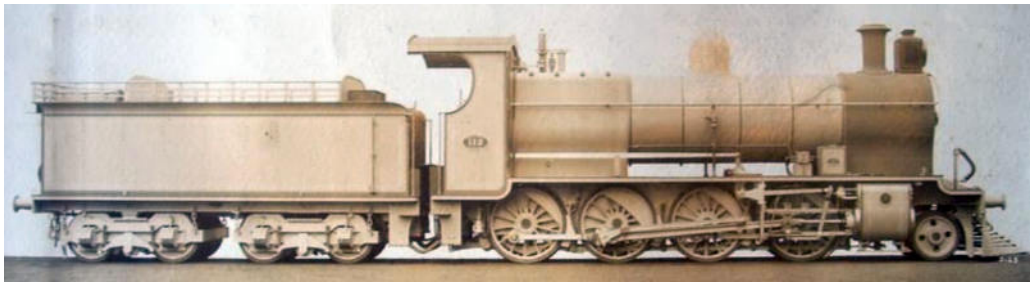
formally at end of 1963.

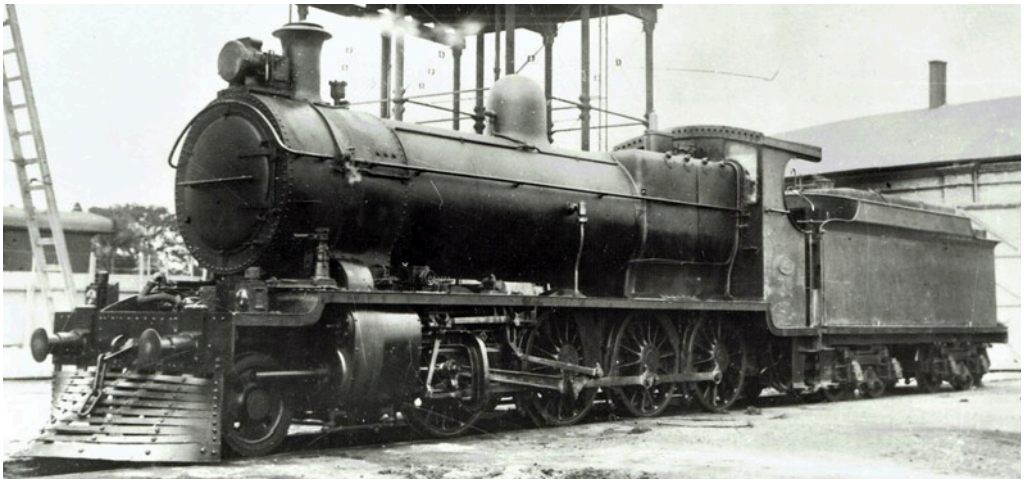
112	w/n 5403	Rebuilt superheated in 1918 [11]. In fleet at end of 1941 [34]. Collided with a bus on a level crossing in Young, 21st May 1956. Out of use by 1968 in Paysandú, and formally with drawn April 1969. But possibly active in 1972. Believed scrapped between 1977 and 1979.
113	w/n 5404	Rebuilt superheated in 1919 [11]. n fleet at end of 1941 [34]. OoS in Bella Vista 1969, Without boiler in 1974. withdrawn formally in 1975.
114	w/n 5405	Supplied super-heated as an experiment. In fleet at end of 1941 [34]. Used as stationary pump in Bella Vista / Carnelli 1967, withdrawn formally in 1974.
123	w/n 5414	Rebuilt superheated in 1917 [11]. In fleet at end of 1941 [34]. OoS in Paysandú 1968, withdrawn formally in April 1969. Sold for scrap 1979.
124	w/n 5415	Rebuilt superheated in 1916 [11]. In fleet at end of 1941 [34]. OoS in Bella Vista 1971, withdrawn formally at end of 1963.
125	w/n 5416	Rebuilt superheated in 1916 [11]. In fleet at end of 1941 [34]. Active in Paysandú 1968 and active 1973, withdrawn formally in 1974.
126	w/n 5763	Had cyls. 19½x24". Superheated from new. In fleet at end of 1941 [34]. Withdrawn formally April 1969, but active 1971 and still existed at Peñarol in 1981. Probably scrapped 1986-7.
127	w/n 5764	Had cyls. 19½x24". Superheated from new. In fleet at end of 1941 [34]. OoS in Paysandú 1968, withdrawn formally in April 1969.
128	w/n 5765	Had cyls. 19½x24". Superheated from new. In fleet at end of 1941 [34]. OoS in Bella Vista 1969, withdrawn formally in 1977, but may have been sold for scrap 1975.
129	w/n 5766	Had cyls. 19½x24". Superheated from new. In fleet at end of 1941 [34]. Seen at Paysandú in July 1969 on freight from Salto [44], and then at Paso de los Toros. Active at Rivera 1972, withdrawn formally in 1978.
130	w/n 5767	Had cyls. 19½x24". Superheated from new. In fleet at end of 1941 [34]. OoS in Paysandú 1968, withdrawn formally in April 1969.
131	w/n 5768	Had cyls. 19½x24". Superheated from new. Involved in the Berrondo collision in May 1927 whilst hauling a southbound train of refrigerated vans. Not seriously damaged. Carried larger boiler as class R-3 from May 1937 to Dec 1941, there after recorded as class R-2. In fleet at end of 1941 [34]. Withdrawn at end of 1963 and lay at Paysandú. Later returned to service. Scrapped in 1979 [9].

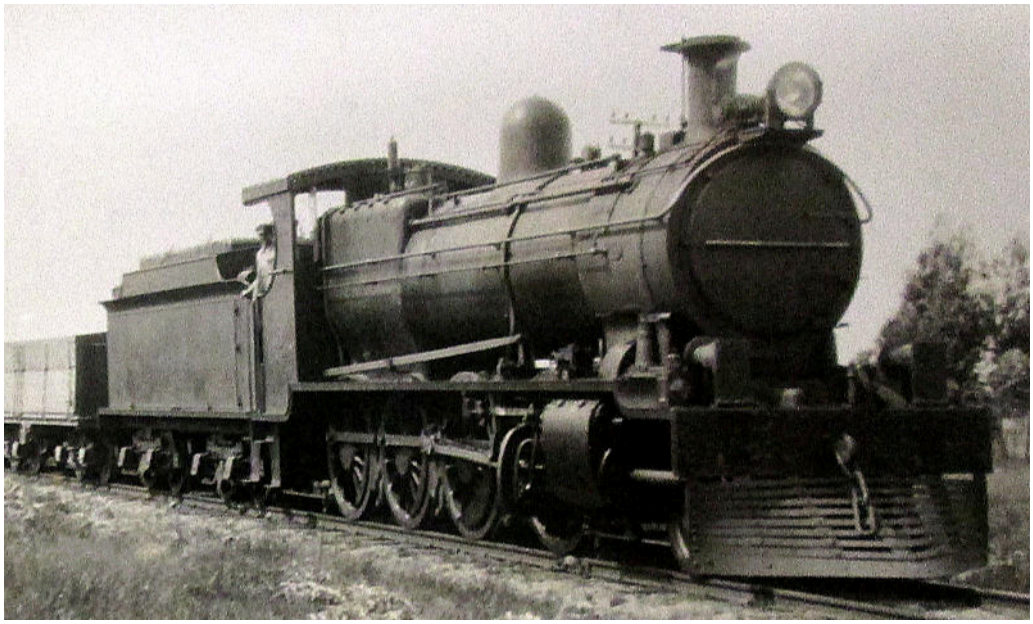


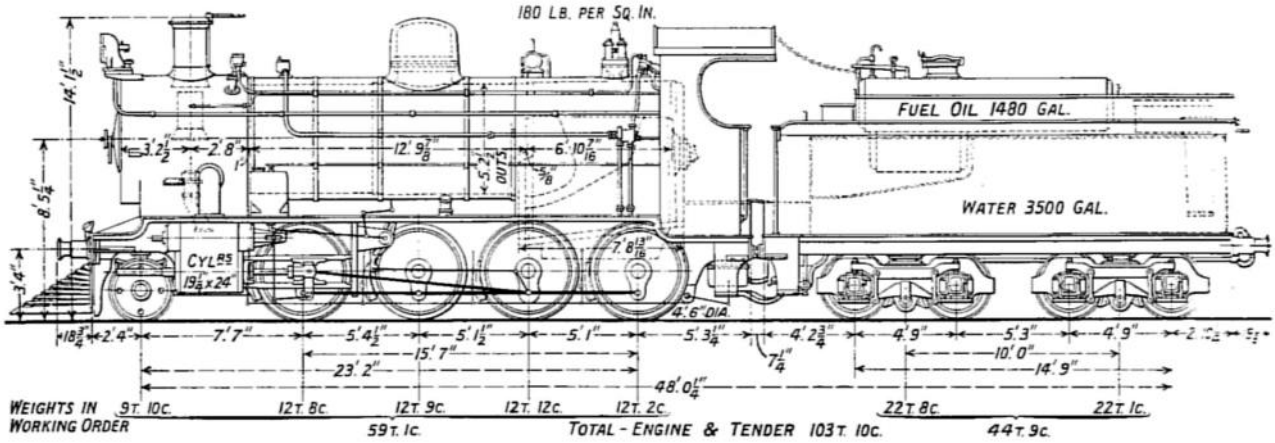


There were differences between the batches. The first three, as above, had protruding valve chests whereas later machines, see below, had smooth casings over both valve chest and cylinder. The 1910 and later engines also had mechanical lubricators on either side.

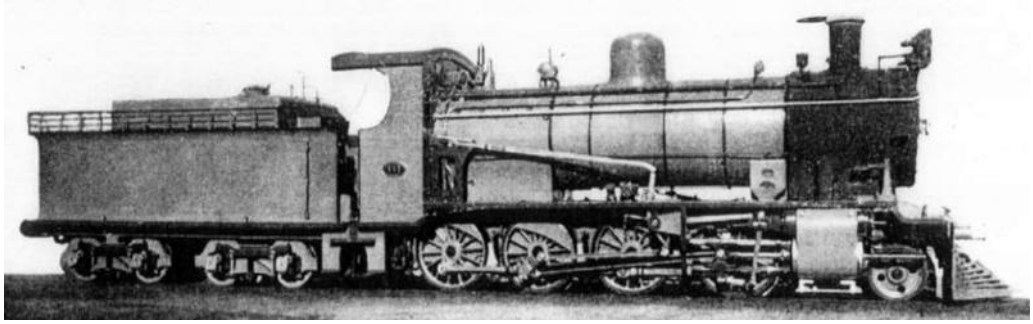




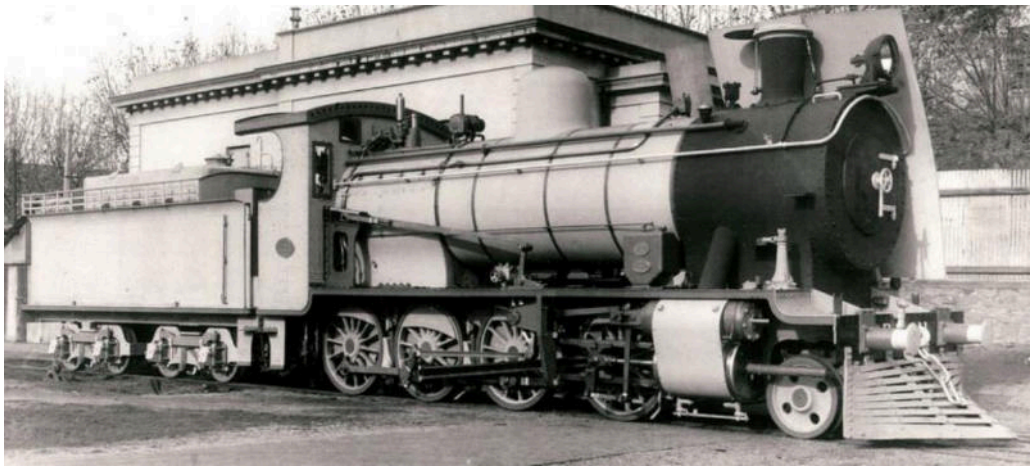




A sketch side elevation of the rebuilt engines, from *The Railway Gazette* of 4th September 1942.



Class R-3 with round-topped firebox, and also now oil-burning.



After rebuilding with new standard round-topped firebox boilers of type 139/24 as class R-4. Note the external steam pipes.

Class D

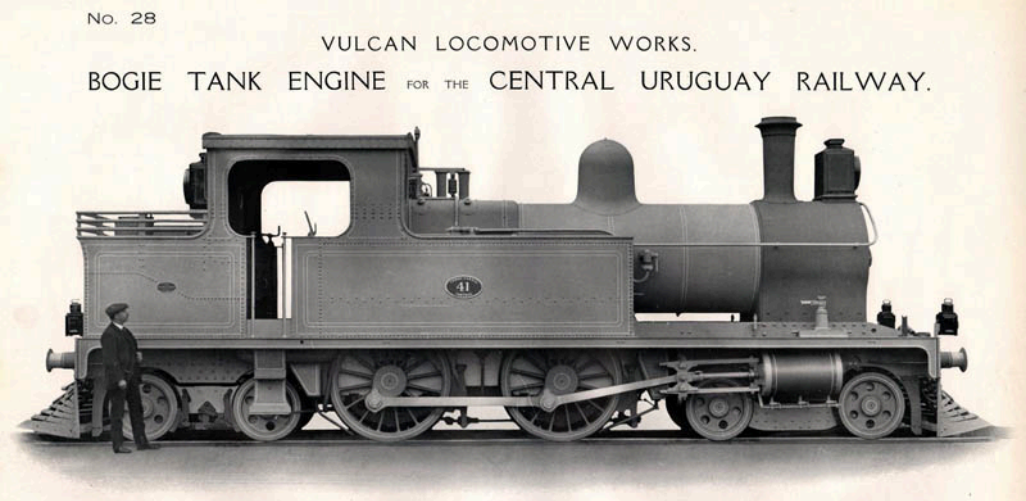
4-4-4T d/w 60", cyls. 16x24", built by Vulcan Foundry in 1913 and 1915

Ordered for CUR. For use on Montevideo suburban services out to Las Piedras in competition with electric trams. Second batch delivered with superheaters already fitted.

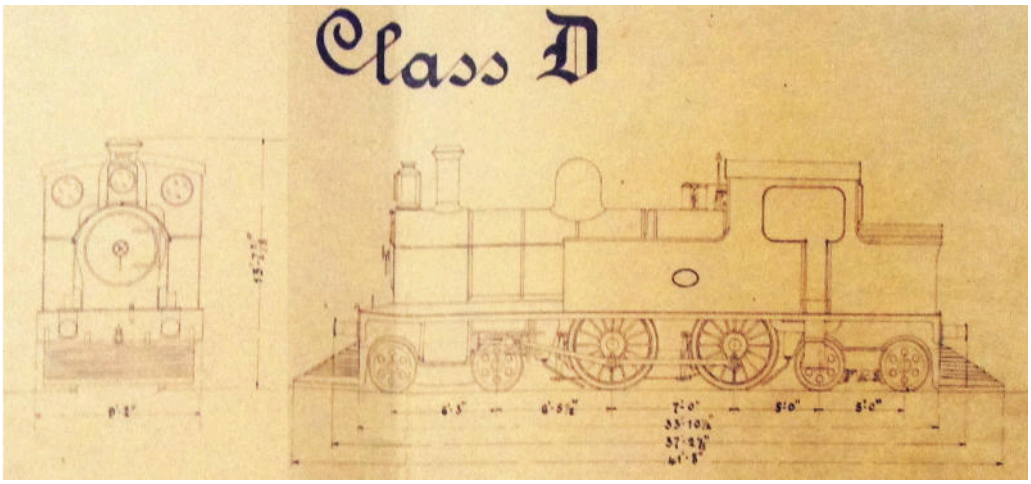
38[2]	w/n 2830	Superheater fitted in 1919 [12]. Converted to oil burner 1921-2 [12]. In fleet at end of 1941 [34]. Used as stationary boiler at Peñarol in 1969. Abandoned at Km 18 in 1987. Boiler still lay at Peñarol derelict in 2007.
39[2]	w/n 2831	Superheater fitted in 1920 [12]. Converted to oil burner 1921 [12]. In fleet at end of 1941 [34]. Served as fixed boiler at Bella Vista until 1984, having been converted into "Equipos Móviles de Limpieza". Scrapped at Km 18 in 1987.
40[2]	w/n 2832	Superheater fitted in 1920 [12]. Converted to oil burner 1921 [12]. In fleet at end of 1941 [34]. Sent to Durazno in 1950s to work the Trinidad branch [12]. Collided with truck in Durazno. Withdrawn May 1958.
41[2]	w/n 2833	Superheater fitted in 1921 [12]. Fitted with N1 boiler in 1936. In fleet at end of 1941 [34]. Withdrawn at end of 1963. Awaited scrapping at Bella Vista in 1979.
42[2]	w/n 2834	Superheater fitted in 1920 [12]. Converted to oil burner 1921 [12]. Fitted with N1 boiler in 1938. In fleet at end of 1941 [34]. Sent to Durazno in 1950s to work the Trinidad branch [12]. Withdrawn August 1954.
43[2]	w/n 2835	Superheater fitted in 1920 [12]. Converted to oil burner 1921 [12]. In fleet at end of 1941 [34]. Latterly was "*Equipos Móviles de Limpieza*". In 1987 lay abandoned at Km 18.
8[2]	w/n 3135	Converted to oil burner 1926-7 [12]. In fleet at end of 1941 [34]. Sent to Durazno in 1950s to work the Trinidad branch [12]. Withdrawn August 1954. Lay there in 1958.
9[2]	w/n 3136	Converted to oil burner 1923-4 [12]. In fleet at end of 1941 [34]. Withdrawn at end of 1963. On scrap line at Bella Vista in 1967 [44]. Awaited scrapping at Peñarol or Bella Vista in 1979.

Nos. **41** and **42** became class D-1 after receiving their N-1 class boilers which made them more powerful.

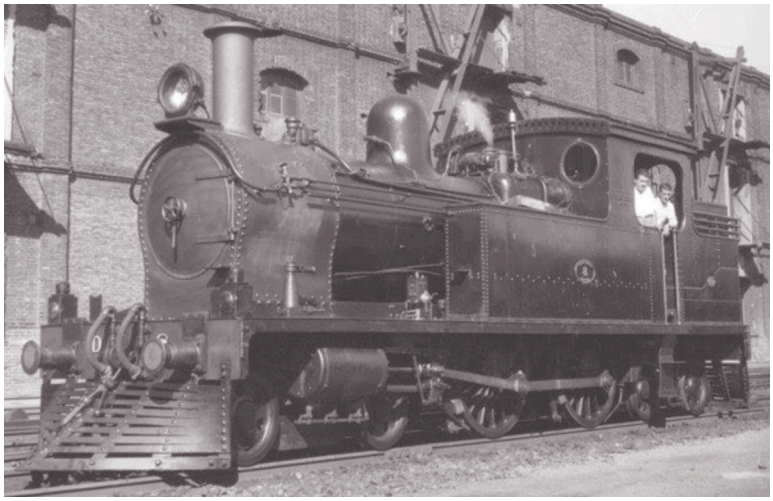
One or two,possibly **38, 39** and/or **43**, operated the Puerto del Sauce to Rosario branch later in their lives.



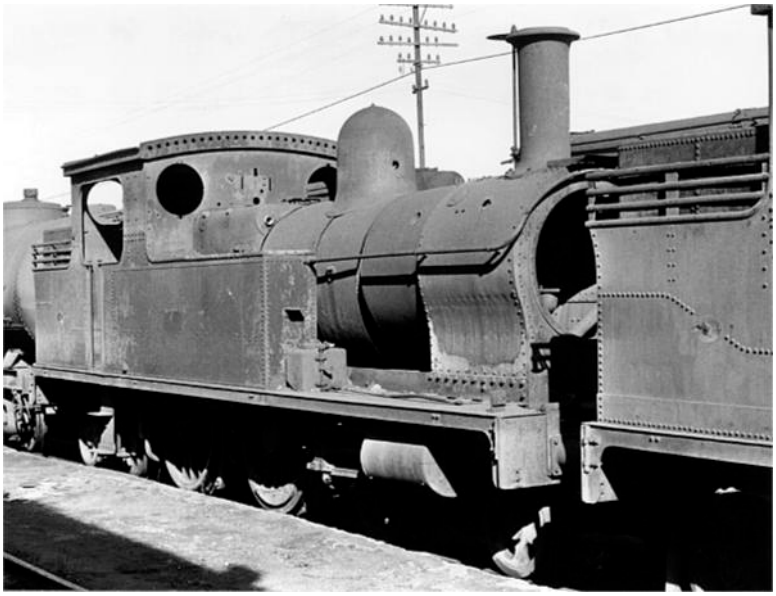
A Vulcan Foundry publicity card. Note the brakes fitted to the wheels of the trailing bogie.



A diagram of class D, by courtesy of the Restoration & Archiving Trust.
Apologies for the distortion introduced when photographing their
copy of the diagram book.



One of the additional pair built in 1915, identifiable by having two vacuum hose stands on the front buffer beam. These two also had superheaters from new.



A pair of 4-4-4Ts lie disused at ?. Photo by courtesy of Richard Pelham.

No. **39** in use as a stationary boiler at the end of its life – minus rods, lagging, tanks, front bogie, cab, and a whole lot more.

Class New F

2-6-0 d/w 72", cyls. 20x26", built by Beyer Peacock in 1914 (132-7) and 1921 (138-41)

Ordered for Central Uruguay Railway. Sr. Iglesias comments that one (no. **136**) or more of the first batch locos had to be converted almost immediately to burn wood, for the duration of the First World War [42]. No. **140** of the second batch was fitted with Willans feed-water heater using a Weir pump.

132	w/n 5769	Rebuilt to 2-8-0 at Peñarol in June 1939, see below.
133	w/n 5770	Rebuilt to 2-8-0 at Peñarol in May 1939, see below.
134	w/n 5771	Rebuilt to 2-8-0 at Peñarol in May 1938, see below.
135	w/n 5772	Rebuilt to 2-8-0 at Peñarol in April 1940, see below.
136	w/n 5773	Rebuilt to 2-8-0 at Peñarol in Dec 1939, see below.
137	w/n 5774	Rebuilt to 2-8-0 at Peñarol in Sept 1939, see below.

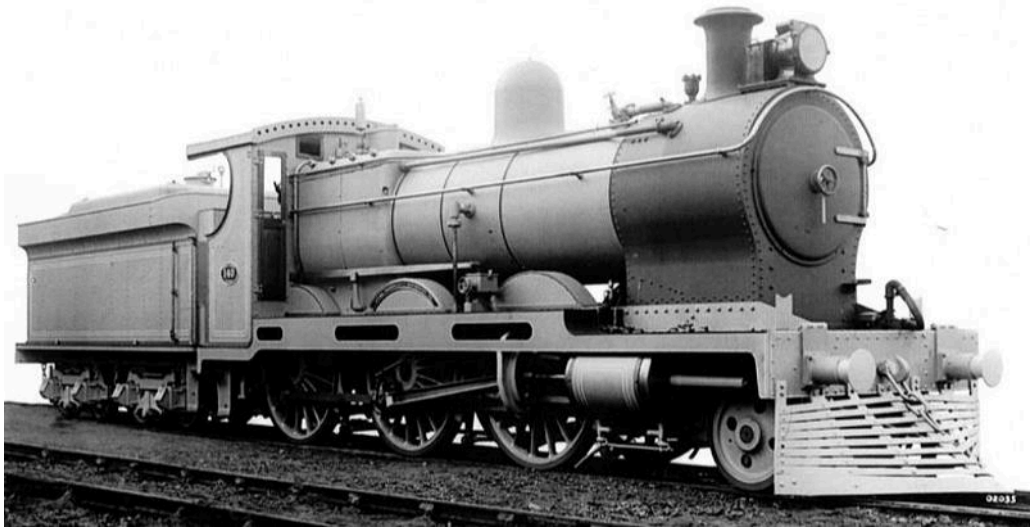
The above 1st batch engines were converted to oil-burning in 1921. Sr. Iglesias suggests [42] that they lost their running plate fairings at the same time. The 2nd batch machines, below, were delivered as oil-burners.

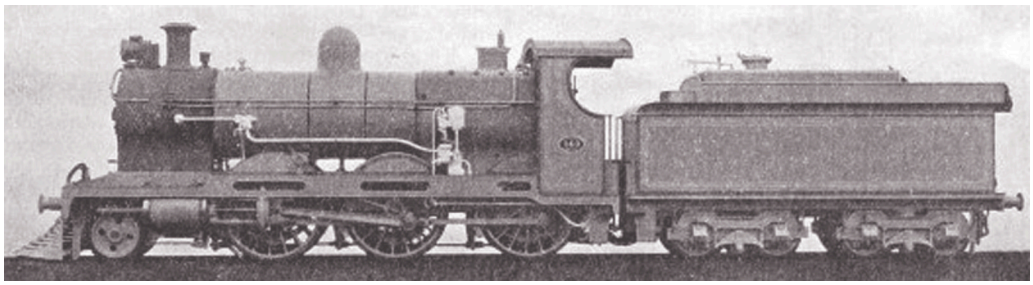
138 'ING. VICTOR SUDRIERS'	w/n 6093	Rebuilt to 2-8-0 at Peñarol in March 1938, see below.
139 'ING. PEDRO MAGNOU'	w/n 6094	Rebuilt to 2-8-0 at Peñarol in Jan 1938, see below.
140 'ING. JOSÉ SERRATO'	w/n 6095	Rebuilt to 2-8-0 at Peñarol in Nov 1937, see below.
141 'ING. GARCÍA de ZUÑIGA'	w/n 6096	Rebuilt to 2-8-0 at Peñarol in Sept 1937, see below.

During the 1920s the engines had gained boiler top feed clack valves, and mechanical lubricators. The tenders had

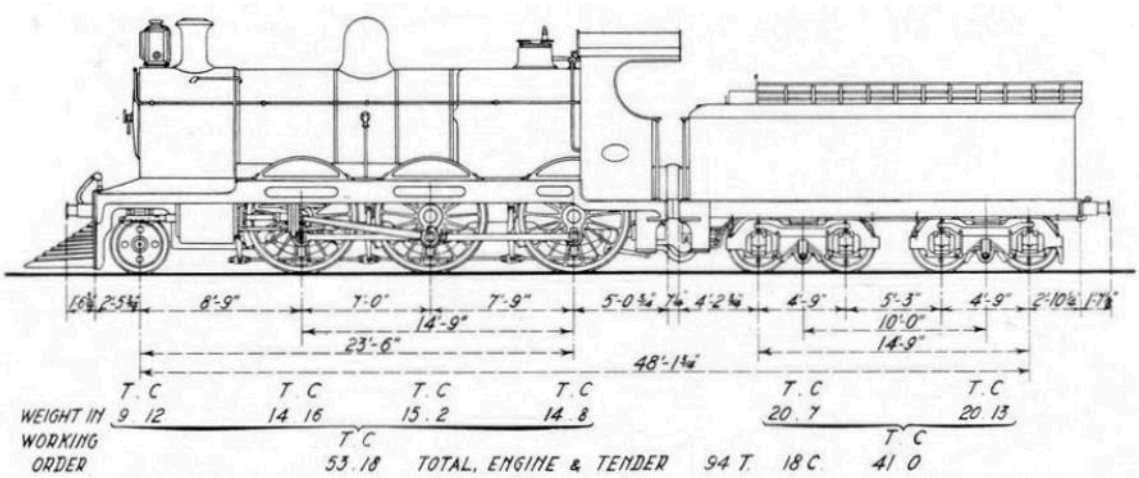
received new bogies, of longer wheelbase and with compensated suspension. These locomotives were later rebuilt as class T 2-8-0s by P. C. Dewhurst in the early 1930s. See below.

Comparison of 1st (above) and 2nd (below) batch locos shows not only the oil tank of the 1921 order, but also the electric headlamp and the piston tailrods.

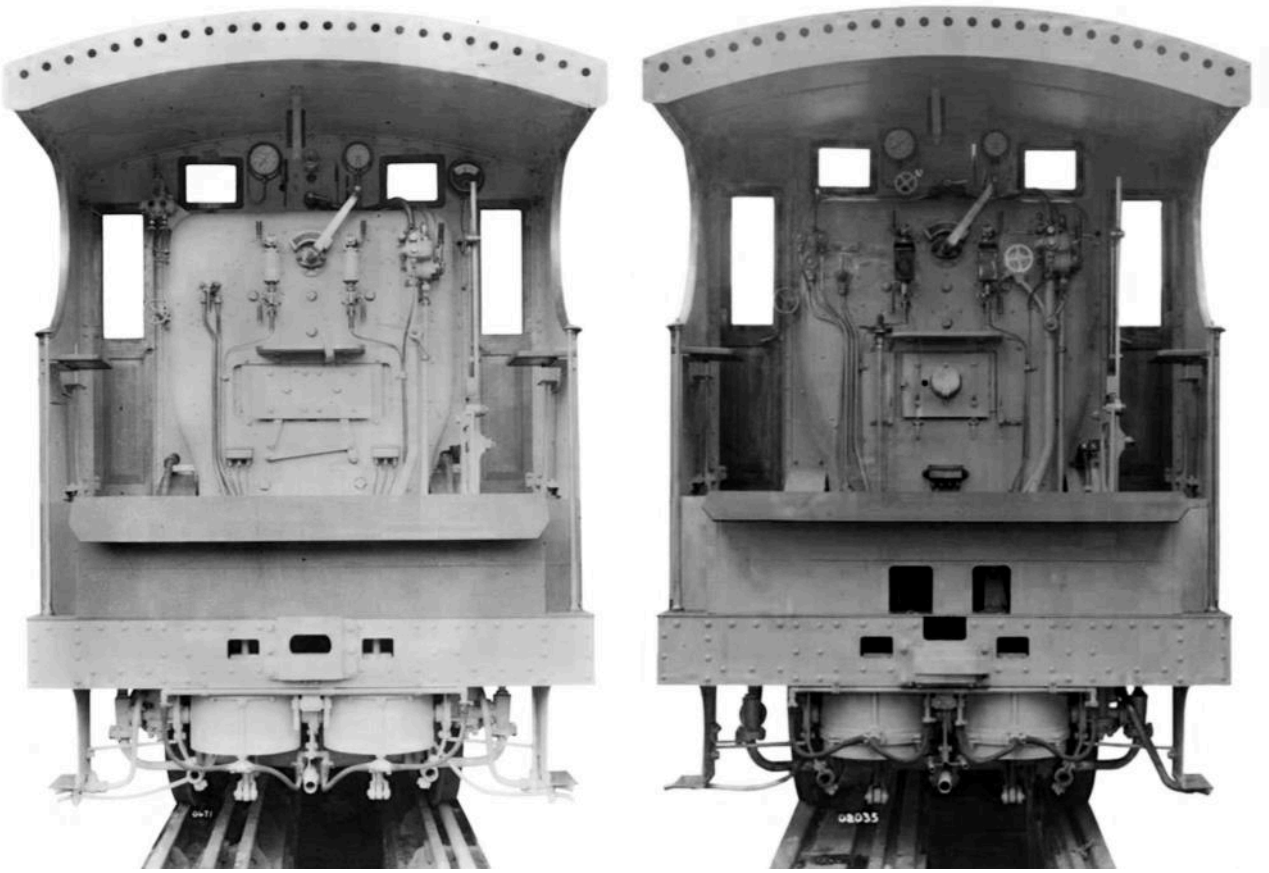




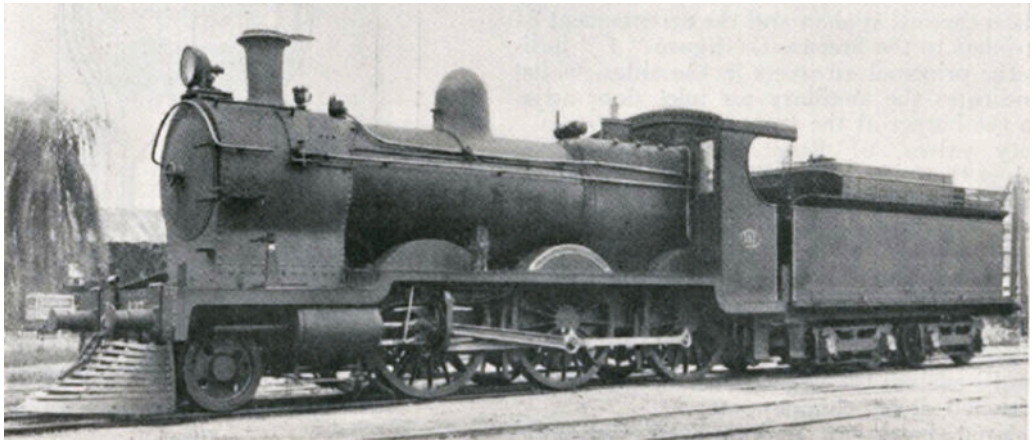
This builder's photo of no. 140 clearly shows the feed-water heater pump fitted to this engine experimentally.



A class New F diagram from *The Railway Gazette* of 30th November 1938.



Cab interiors of class New F locos of the 1914 (coal-fired, left) and 1921 (oil-fired, right) batches.



Class F no. **137** as modified with running plate valences removed.
Photo from *The Locomotive* issue of 15th April 1939.

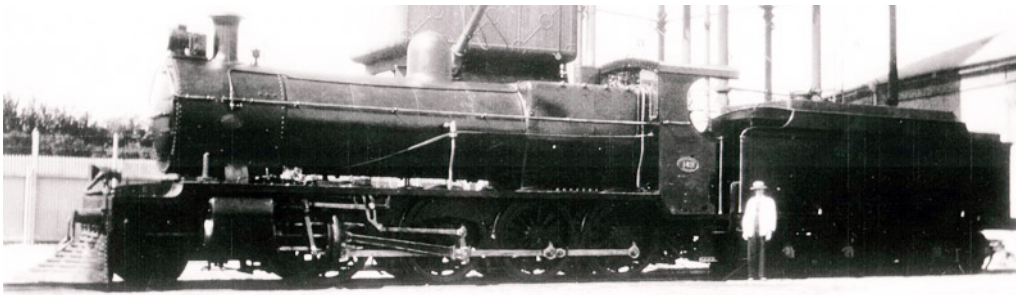
Class S

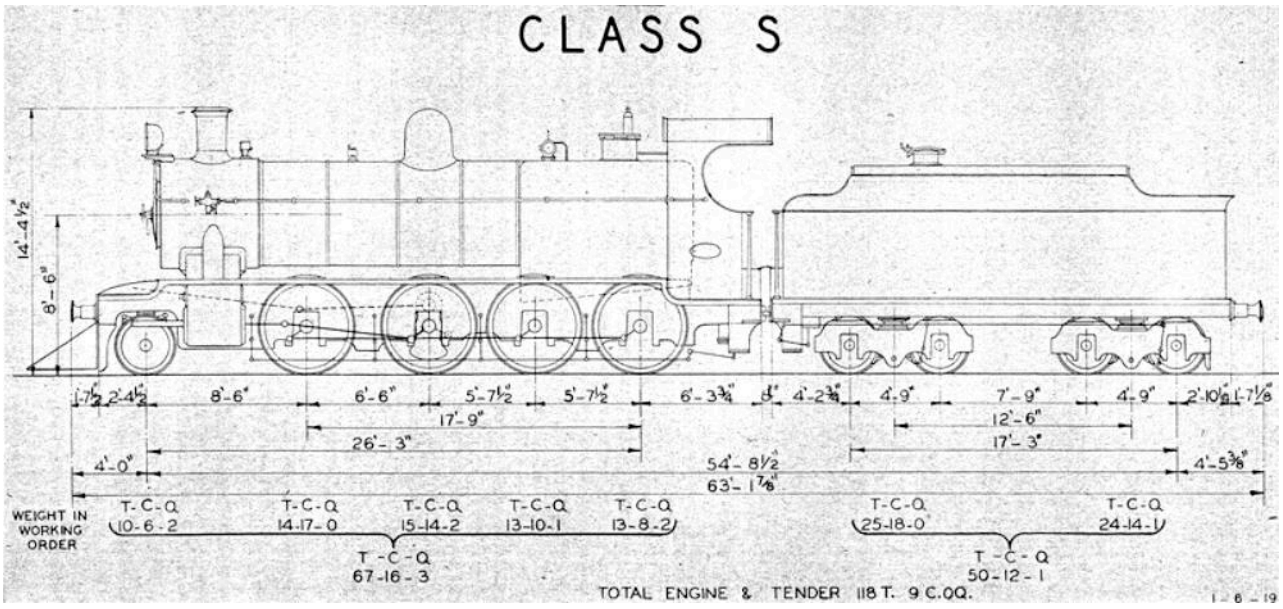
2-8-0 d/w 60", cyls. (3) 17½x26", built by Hawthorn Leslie in 1921

Ordered for the CUR on 22nd September 1919 Schmidt superheaters and piston valves. Equipped to burn oil only. Delivered late Augut to late October 1921. Oval number plates bearing 'FERROCARRIL CENTRAL' on cabsides and back of tender. Fabian Iglesias has speculated that these were originally to have been built as 4-8-0s [24]. He also points out that whilst the outside cylinders had Walschaerts valve gear, the inside cylinder used Stephenson link motion. Iglesias also explains that the principal advantage of the three cylinder layout was not increased power as might have been supposed, but a smoother motion for Uruguay's cattle trains and consequently reduced stress for the animals and thus more tender meat when they arrived at the *frigoríficos*. The S class locos had smokebox doors fitted with rim latches rather than the British-style central dart which had previously been standard in Uruguay. A thermic siphon was fitted in the firebox. Few modifications were made, since these engines were already superheated and oil

burning. However, electric lighting was soon fitted and the main outside steam-pipes were rerouted more obviously, with very visible angular casings. Later in life the big smokebox doors were replaced by bolted smokebox front plates fitted with smaller doors fastened by the traditional dart.

142	w/n 3447	In fleet at end of 1941 [34]. Seen on Central to Minas train in Jan. 1968 [44]. Still working in 1972, but withdrawn certainly by Jan 1975. Probably scrapped at end of 1970s.
143	w/n 3448	In fleet at end of 1941 [34]. Withdrawn at end of 1963. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.
144	w/n 3449	In fleet at end of 1941 [34]. Seen in service Paso de los Toros to Montevideo in April 1973 [44]. Rebuilt 1976. Withdrawn 1979. Ended up in outdoor museum for several years then taken to Canelli station, and eventually allocated to CEFU. Later it was returned to the AFE but was left to rot. Was at Peñarol roundhouse in 2005.
145	w/n 3450	In fleet at end of 1941 [34]. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.
146	w/n 3451	In fleet at end of 1941 [34]. Withdrawn in 1965. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.
147	w/n 3452	In fleet at end of 1941 [34]. Withdrawn in 1965. On scrap line at Bella Vista in Jan. 1968 [44].



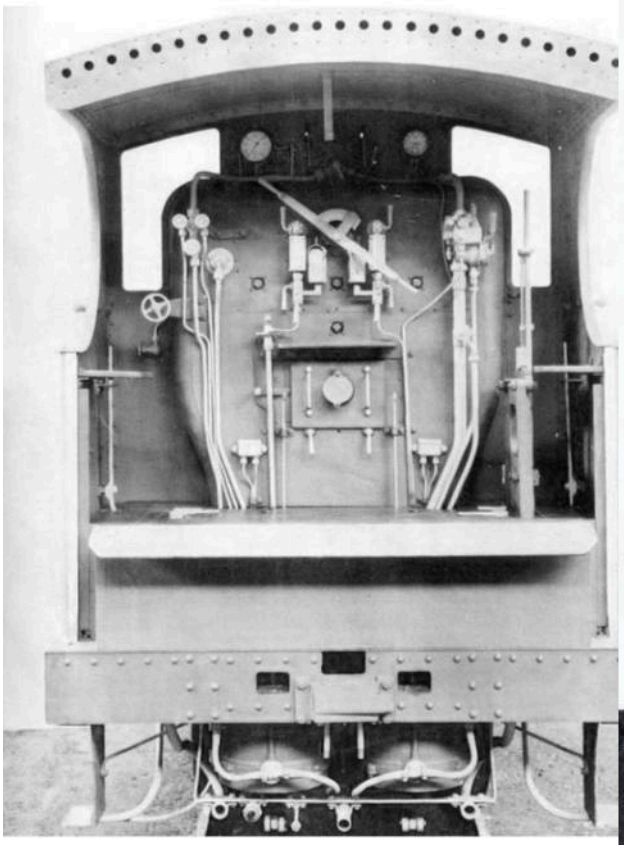


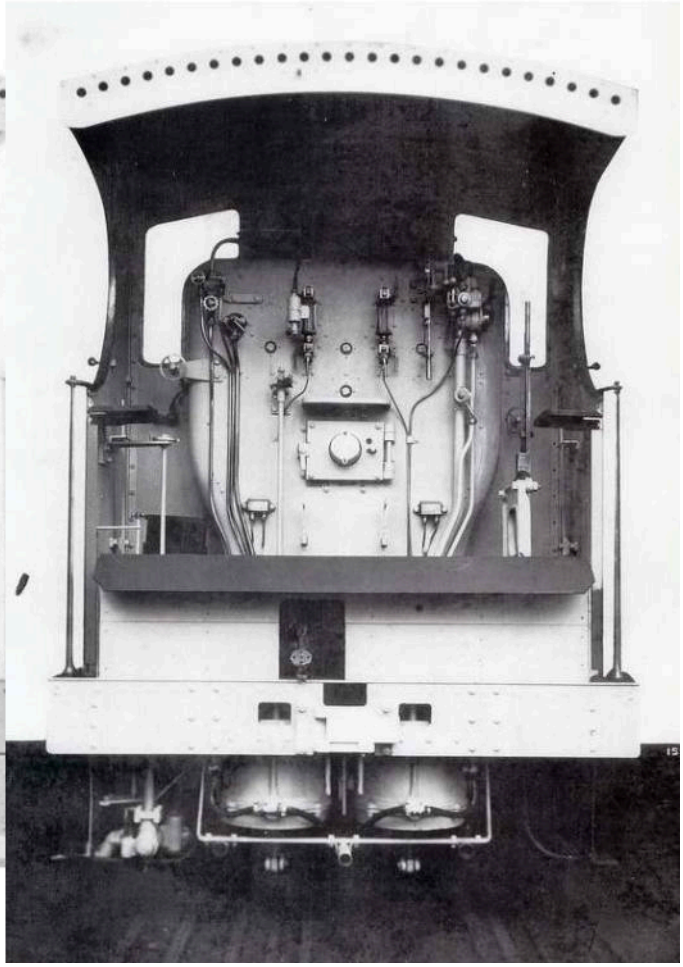
Class S

2-8-0 d/w 60", cyls. (3) 17½x26", built by Beyer Peacock in 1929

Ordered for Central Uruguay. Front end throttle. Apparently these four locos were rebuilt as two cylinder machines around 1940, with the outside cylinders increased in diameter from 17½" to 19½".

148	w/n 6574	In fleet at end of 1941 [34]. Withdrawn at end of 1963. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.
149	w/n 6575	In fleet at end of 1941 [34]. Withdrawn at end of 1963. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.
150	w/n 6576	In fleet at end of 1941 [34].
151	w/n 6577	In fleet at end of 1941 [34]. On scrap line at Bella Vista in Jan. 1968 [44]. Scrapped at Carnelli / Bella Vista around 1970.





These images show the cab interiors of the first and second batches of class S 2-8-0s. The most striking thing is how bare they are, and actually how simple and old-fashioned these locos were. The reverser is a simple lever, or Johnson bar in American parlance, rather than making the driver's life easier by means of a screw. On the first batch, left, the regulator is a traditional dome-mounted design with therefore the handle in the middle of the backhead. The second batch had a smokebox-mounted multiple-valve regulator and therefore the handle is now a pull-out design just to the left of the vacuum ejector on the right hand side of the backhead. The reverser has also been mounted somewhat lower, which will have made the driver's life a little less strenuous.

Conversions to oil fuel

In the early 1920s began the conversion of the bulk of the fleet to oil fuel. This applied to classes B, C, D, F, G, H, L,

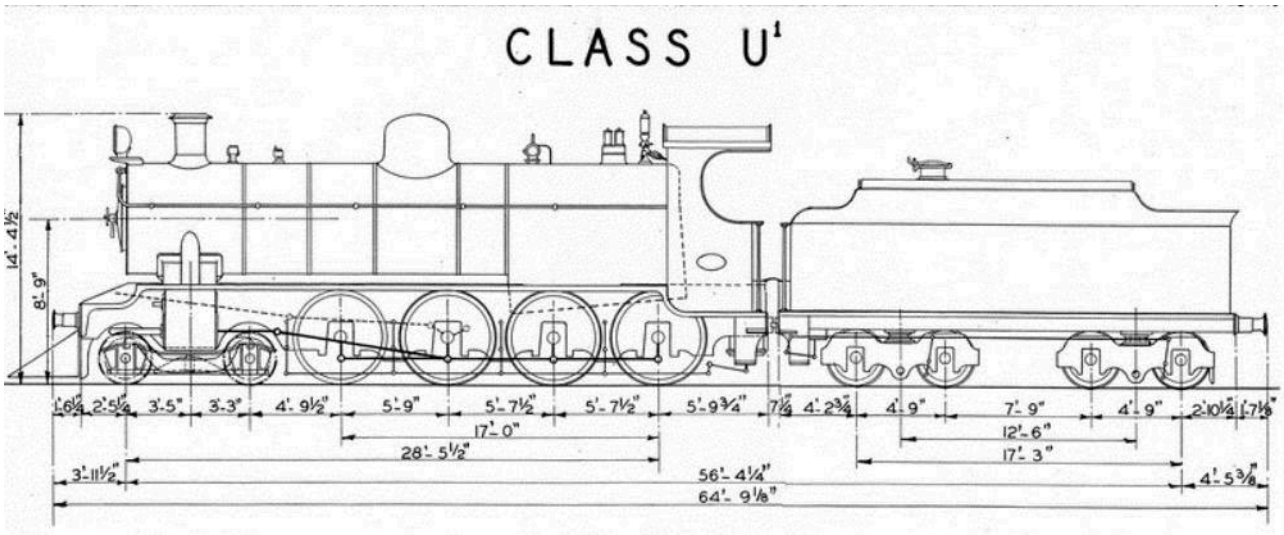
N, R and S, but not to classes A, E, K, P [21].

Class U, order cancelled

Apparently the CUR ordered four new locos from Beyer Peacock around 1929-1930 but then cancelled the order owing to the world economic situation. These would have been locos nos. **152-155**. [24] Somewhat later, during the 1940s, Dewhurst proposed rebuilding class S locos to get extra power despite the inability to order new machines during the war. Iglesias [24] comments: "*Para convertirlas en Clase U, lo que se pretendía era cambiarle los cilindros internos, por otros nuevos, combinados con la base de la caja de humos de la máquina que sería agrandada al igual que el bastidor para albergar al nuevo cilindro interno, y lo más importante, al alargar el bastidor, se les agregaría un eje motriz más al final, pasando a las maquinas desde un rodado 2-8-0 a un rodado 2-10-0. Además, se instalaría un Sifón Térmico conectado a la caja de fuego, y los cilindros exteriores serian reequilibrados. En el caso de las Clase U1 la idea era aumentar su longitud, pasando a la máquina de una longitud de 63' 1 7/8" a 64' 9 1/8".* "
These locomotives would not only have been longer, but their cabs would also have been modified "by fitting a cabin of the American type".

Class U-1, another abortive proposal

A second proposal from P. C. Dewhurst was to rebuild S class engines to 4-8-0 configuration. Again Iglesias [24] comments: "*Al igual que las Clase U, las Clase U1 tendrían un Sifón Térmico conectado a la caja de fuego, y los cilindros exteriores serian reequilibrados. El aspecto más sorprendente de estas Clase U1, sería que para albergar una caja de humos más grande, un bastidor más largo y un cilindro interno más potente, se instalaría un bogie frontal sustituyendo al eje guía simple que tenían de origen estas máquinas, a modo de poder con el bogie de dos ejes, soportar el incremento de peso delantero de la locomotora, los ejes del bogie estarían ubicados uno delante del cilindro exterior y otro del lado de atrás.*
De a verse cumplido este proyecto, las nuevas Clase U y U1, las maquinas U1 pasarían a ser 4-8-0, lo que se pretendía con ello era darles más estabilidad, por tanto, más que ser usadas como locomotoras de carga, pasarían a ser usadas más bien para servicios de pasajeros, habilitándolas a velocidades mayores."
Lack of finance caused the cancellation or postponement of these projects in 1945, and after that the forthcoming nationalisation meant that such speculative schemes had no future.



The proposed rebuild of class S locos to become class U-1 4-8-0s.

Class T

2-8-0 d/w 60", cyls. 20x26", rebuilt from class F 2-6-0s at Peñarol works in 1937-40

These were the most fundamental rebuilds ever undertaken in Uruguay, and originated from P. C. Dewhurst, the CUR's CME from 1931 onward. The purpose was to increase power, haulage capacity and adhesive weight whilst reducing the axle loads and the fuel consumption.

New boilers were planned, with round-top fireboxes containing a thermic syphon, the whole to be mounted on frames extended by electric welding. In the event only no. **141** received the new boiler initially, thus gaining the designation of class T1, whereas the others retained their original boilers and were entitled class T. Ross pop safety valves, a steam turret and a large diameter dome were included in the new design.

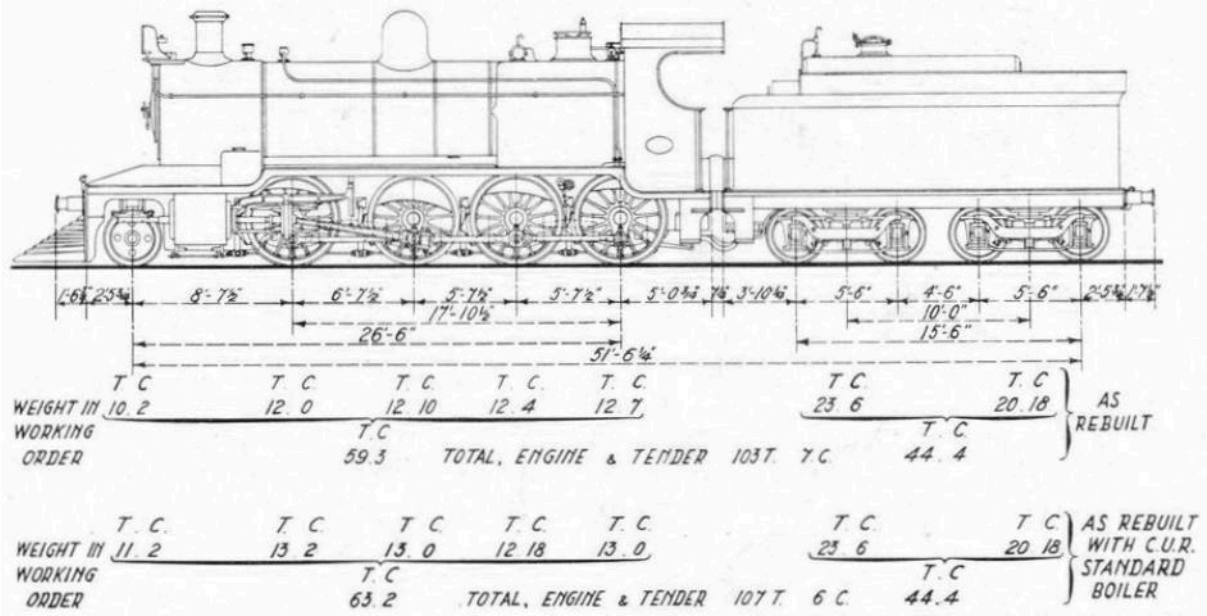
"The arrangement of the smoke box comprises a chimney of a relatively large diameter, a low exhaust pipe, a somewhat long hood, a space having been left between this and the base of the chimney to improve vaporization in the boiler; the orifice of the exhaust pipe being equipped with a "robber". The stirrer is a device designed to avoid excessive back pressure in the cylinders, automatically increasing the area of the orifice; exhaust, when job conditions demand it.

The ashpan is of a type that is being standardized in the Central Railroad of Uruguay, where the proportion of the entrance gives air under the burner, at the door of the hearth and on the sides of the ashpan, is related to the total area of the gas passage. through the boiler tubes. The burner (one) is a flat type with steam spray and is located at the front of the ashtray. The heating of the fuel "fuel oil" is done in two different phases by means of steam. Preliminary heating takes place in the fuel storage tank, placed on the tender, and the second heating is done as the fuel passes along the pipe and through a reheater on its way to the burner."

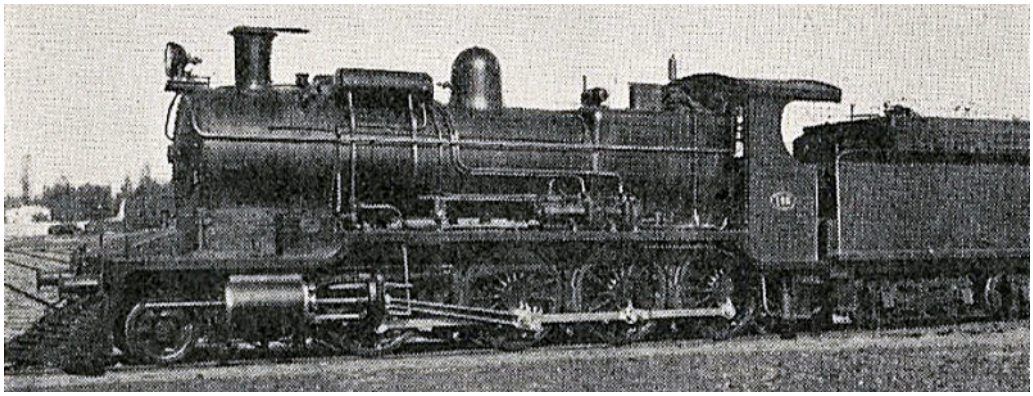
132	Originally BP w/n 5769	Rebuilt to class T in June 1939. In fleet at end of 1941 [34]. Withdrawn 31 Dec. 1963, later lying at Canning without tender, scrapped in late 1960s?
133	Originally BP w/n 5770	Rebuilt to class T in May 1939. In fleet at end of 1941 [34]. Out of use by 1978.
134	Originally BP w/n 5771	Rebuilt to class T in May 1938. In fleet at end of 1941 [34]. Out of use in 1978, sold for scrap in 1979 possibly at Bella Vista.
135	Originally BP w/n 5772	Rebuilt to class T in April 1940. In fleet at end of 1941 [34]. Seen on Central to Minas train in Jan. 1968. Operating mid 1970s, out of use 1978, sold for scrap 1979 possibly at Bella Vista.
136	Originally BP w/n 5773	Rebuilt to class T in Dec. 1939. In fleet at end of 1941 [34]. Out of use 1979 but later operated from Peñarol, was at Km. 18 in 1986, fate unknown.
137	Originally BP w/n 5774	Rebuilt to class T in Sept. 1939. In fleet at end of 1941 [34]. .Out of service 1977, sold for scrap 1979 possibly at Bella Vista. Tender was still there in 1986.
138	Originally BP w/n 6093	Rebuilt to class T in March 1938. In fleet at end of 1941 [34]. OoS at Bella Vista in Jan. 1968 [44]. Operating 1977, out of use 1981 and scrapped 1984 at Paysandú. Tender was at Km. 18 in 1986.
139	Originally BP w/n 6094	Rebuilt to class T in Jan. 1938. In fleet at end of 1941 [34]. Withdrawn 1981, later fate unknown.
140	Originally BP w/n 6095	Rebuilt to class T in Nov. 1937. Large boiler fitted June 1940 and therefore became class T-1. In fleet at end of 1941 [34].

Henry Finch [44] says these two (140-1) were the first to be rebuilt and were not successful, hence their early demise. Withdrawn 14th April 1969, fate unknown.

141 Originally BP w/n 6096 Rebuilt to class T1 in Sept. 1937. In fleet at end of 1941 [34]. Large boiler was fitted and therefore was class T-1. Withdrawn 14th April 1969, fate unknown.



A class T diagram from *The Railway Gazette* of 30th November 1938.



Seemingly a class T 2-8-0 modified with a feed-water heater and a pump.
No details are yet known.

Joint administration

To minimise costs, the operations of the CUR, the Midland, and the Northern were combined in 1938. These railways were in any case owned largely by the same share-holders. Midland locos **13-22** became CUR **174-183**. Interestingly none of these engines were recorded as part of the CUR fleet in the 1941 list [34].

2-6-0 d/w 54", cyls. 16½x24", built by Hudswell Clarke in 1906

Ordered via James H. Tozer & Son Ltd for *FC Midland del Uruguay*.

174	w/n 741	Ex Midland no. **13**.
175	w/n 742	Ex Midland no. **14**.

2-6-0 d/w 54", cyls. 17x24", built by Beyer Peacock in 1908-9 (15-16), 1910 (17-18), 1911 (19-20), and 1912 (21-22).

Ordered for Midland railway of Uruguay.

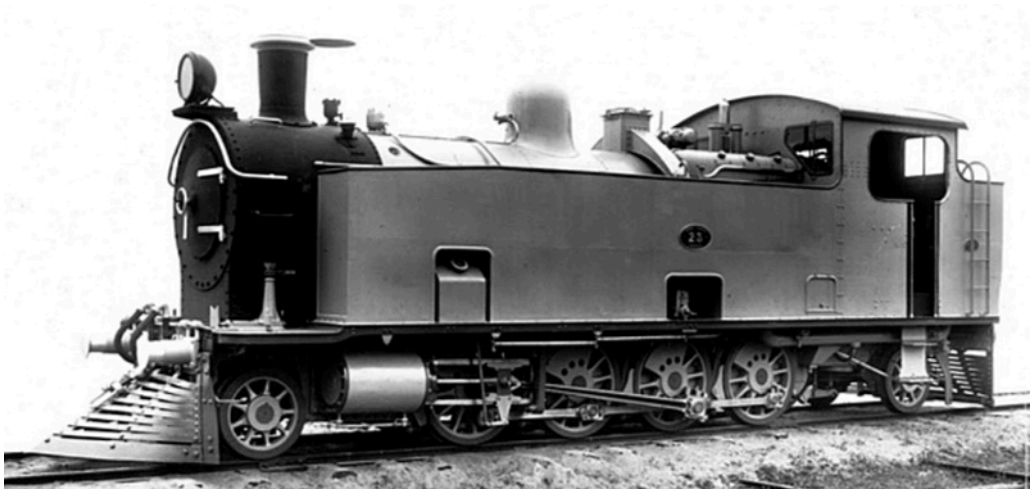
176	w/n 5152	Ex Midland no. **15**.
177	w/n 5153	Ex Midland no. **16**.
178	w/n 5325	Ex Midland no. **17**.
179	w/n 5326	Ex Midland no. **18**.
180	w/n 5383	Ex Midland no. **19**.
181	w/n 5406	Ex Midland no. **20**.
182	w/n 5533	Ex Midland no. **21**.
183	w/n 5534	Ex Midland no. **22**.

Classes W and H-1

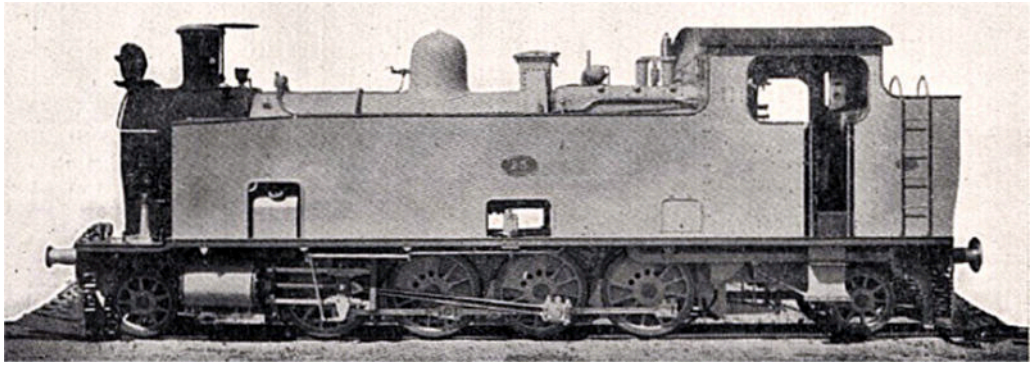
2-8-2T and 2-8-2 d/w 47", cyls. 18x24", originally built by Beyer Peacock in 1884

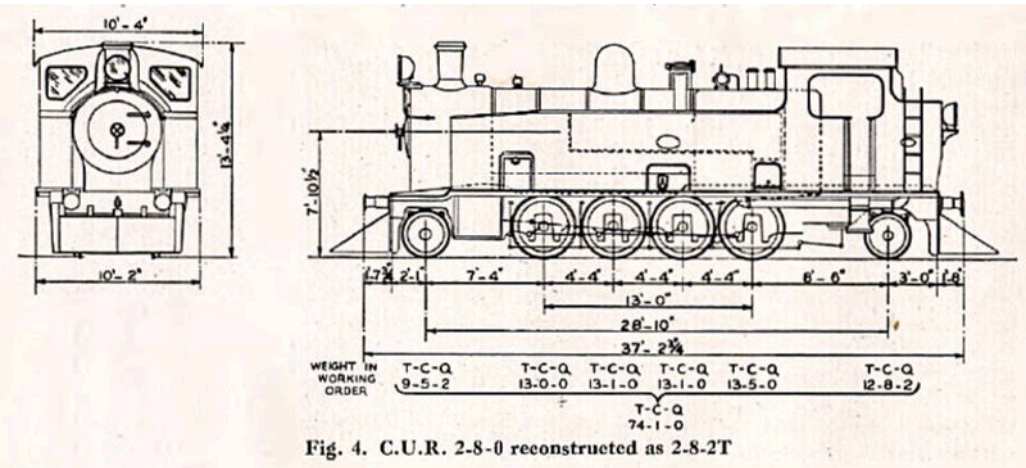
Early in the 1940s P. C. Dewhurst decided to rebuild the class H 2-8-0s into 2-8-2Ts. These locos were no longer front line freight power and after reconstruction they could become very useful heavy shunters. No. **23** was rebuilt first, utilising the boiler from class R no. **110**.

23	Originally BP w/n 2513	Withdrawn 1963. On scrap line at Bella Vista in Jan. 1968 [44]. Lay at Carnelli / Bella Vista for some years. Scrapped there in 1970s or 1980s.



Class W no. 23. Note the centre-line tank filler at the front of the firebox.

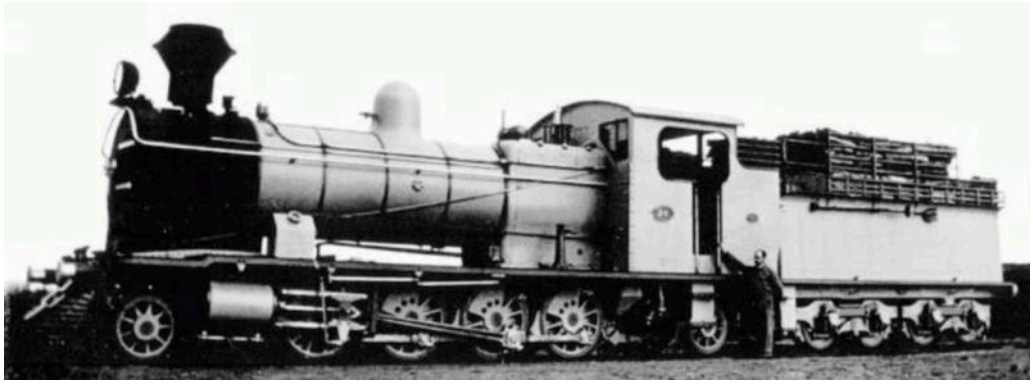


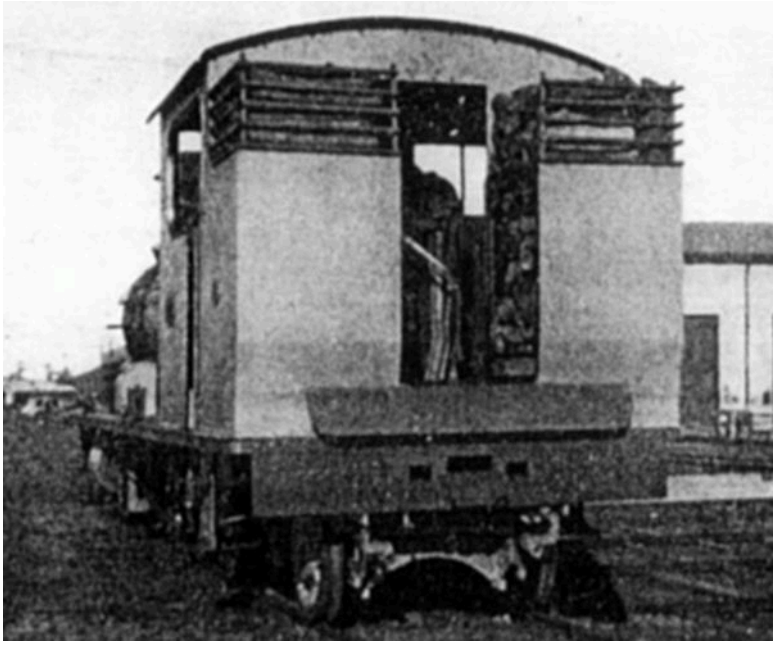


A CUR diagram showing the class W, as published in *The Locomotive*.

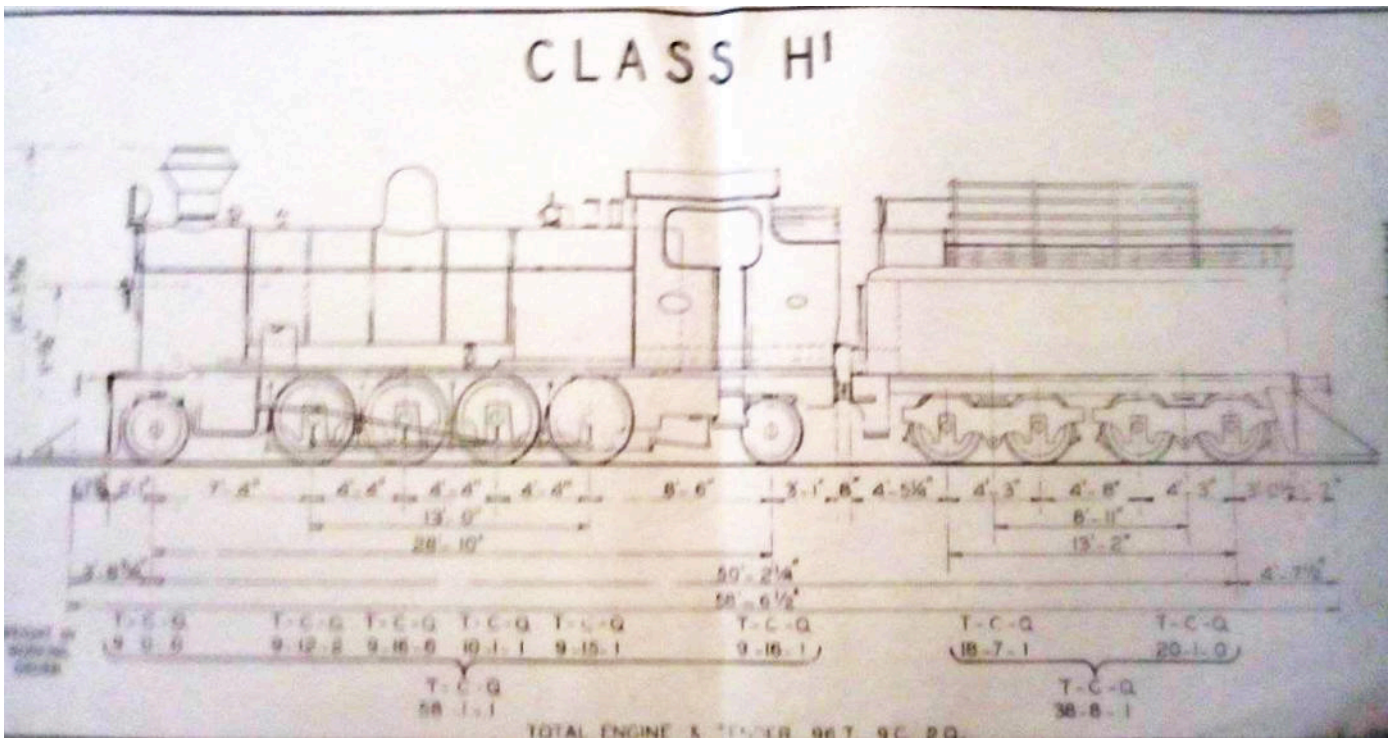
However, by the time that nos. **22** and **24** began to be worked on in 1943-4, wartime shortages were having an effect. The trailing pony trucks were added, and the bigger class R boilers, from locos **109** and **111**, but instead of adding side tanks class N tenders were attached so that wood fuel could be used instead of expensive oil. The new rear bunkers therefore also gained a central walkway to access the front of the tender. The resulting locos were designated H-1 rather than W as no. **23** had been.

22	Originally BP w/n 2512	Withdrawn in 1964 and sold to the Armor *frigorifico* at Livramento just across the Brazilian border from Rivera, but then was loaned back to *AFE* owing to a shortage of motive power and used at Rivera until 1978.
24	Originally BP w/n 2514	Withdrawn in 1956.





This photo shows class H-1 no. **22**. It would appear that the loco is now oil-fired, judging by the tank filling up the tender's bunker space.



A very poor quality image of a CUR diagram sheet showing the class H1, but it might be useful. If a better version is found it will replace this one.

Dewhurst's unfinished work

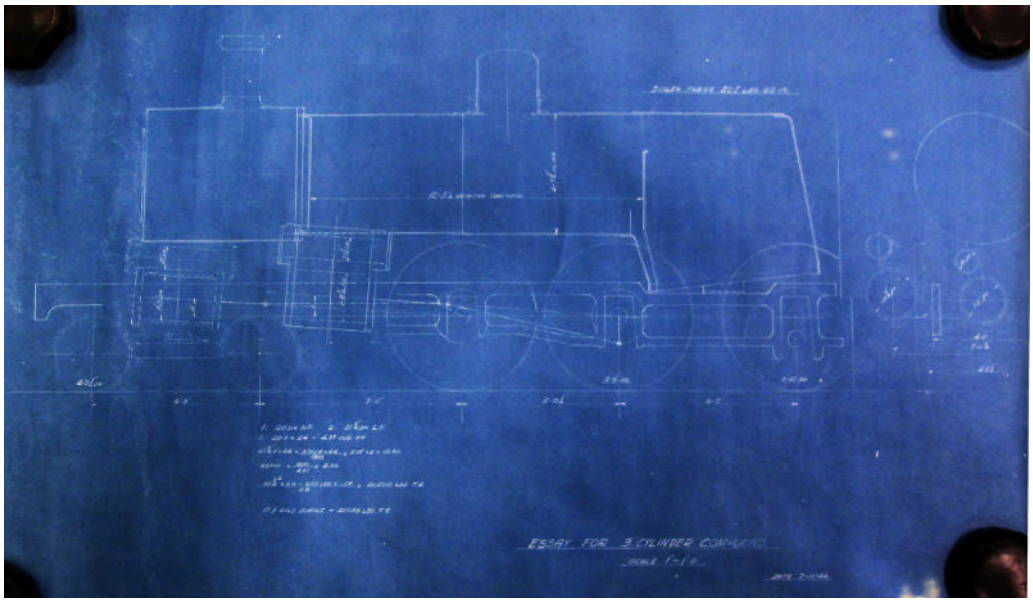
Amongst Paul Dewhurst's archive of material at the National Railway Museum in York, are various drawings showing that he had been working on a number of new loco designs during the 1940s, in the hope that when peace returned to the world orders could be placed and the CUR's fleet modernised. In the event that did not happen. The railway was not surprisingly short of cash after the end of the war even though Uruguay had not been a combatant, and then nationalisation loomed.

However, these abortive designs are of interest, and therefore several of them are illustrated here.

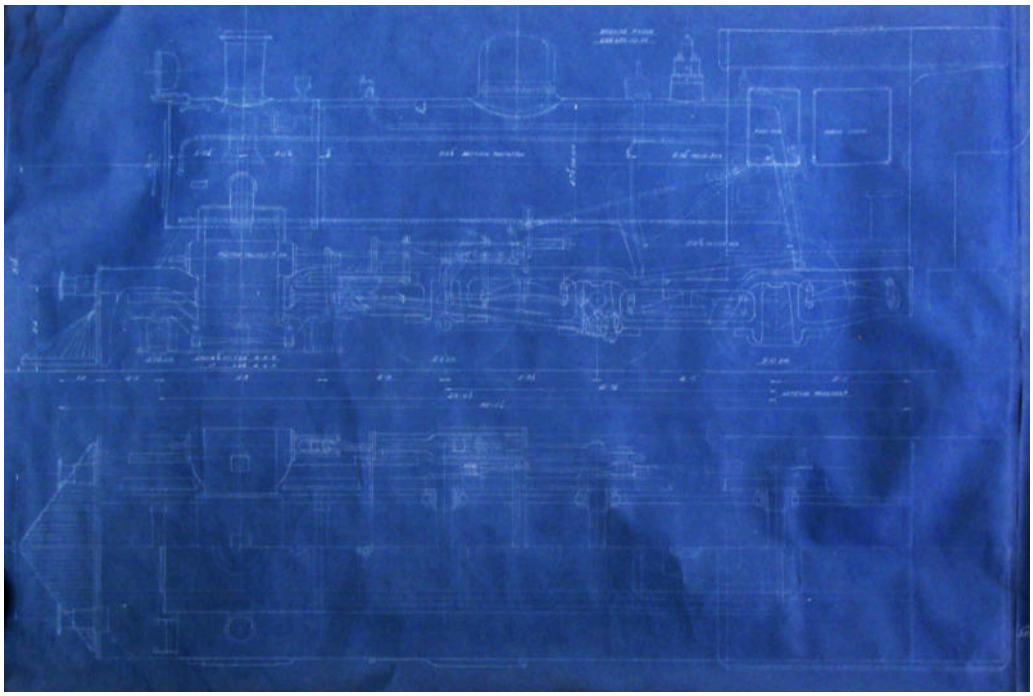
Proposed three cylinder compound 4-6-0 or 4-4-2

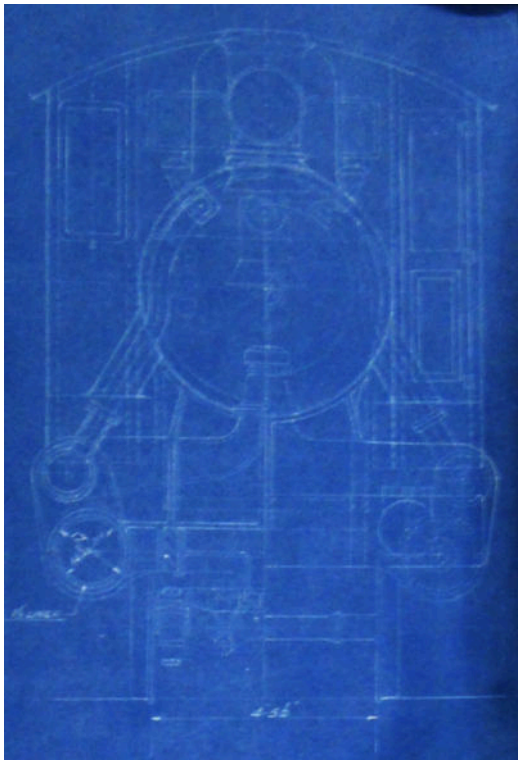
The most intriguing feature of each of the first two designs of 4-6-0 and 2-6-0 is that in each case the bar frames have an extra deep set of rear horn guides so that the rearmost set of driving wheels could be replaced by smaller carrying wheels without major surgery. That this was intentional is shown by the alternative axle position and wheel outline having been inked in, and by an annotation suggesting that 1½" thick cylinder liners would have been fitted when the locos were running as 4-4-2 or 2-4-2.

It is difficult to envisage the purpose of these latter options. The weight would have been reduced but not by a large amount, perhaps one ton.



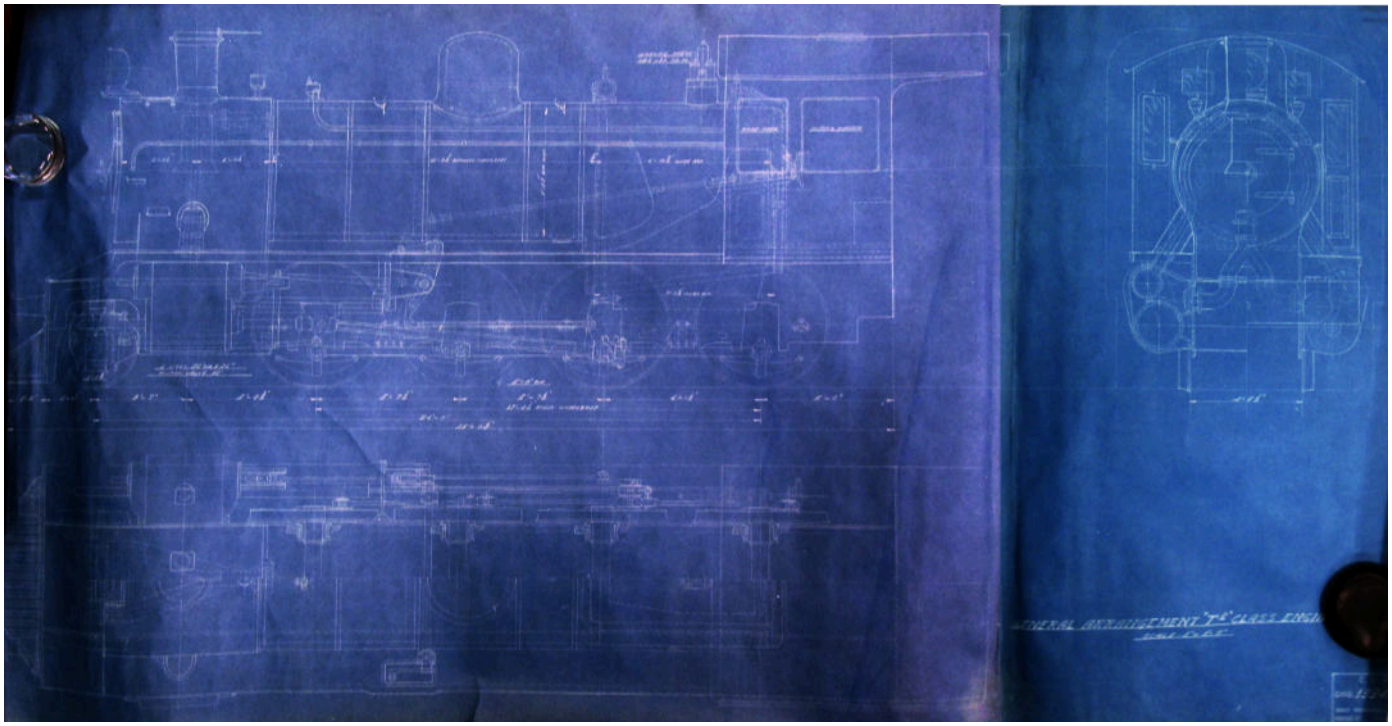
Proposed class X 4-6-0 or 4-4-2!





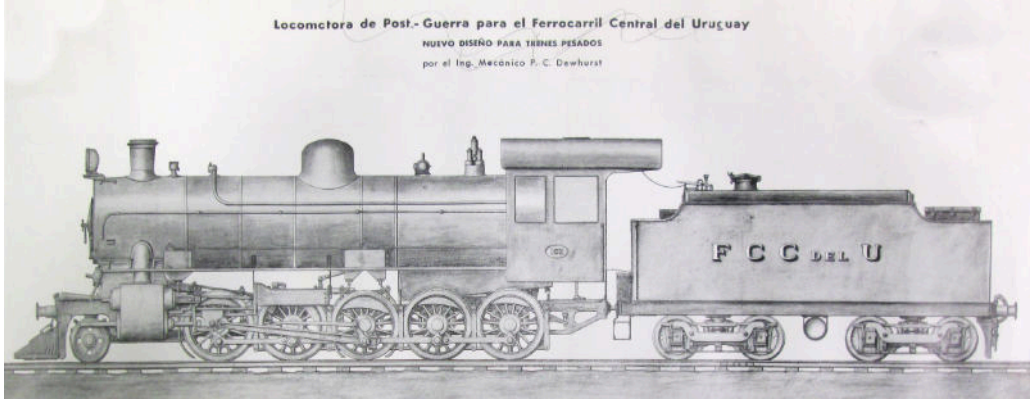
Proposed class T2 2-8-0

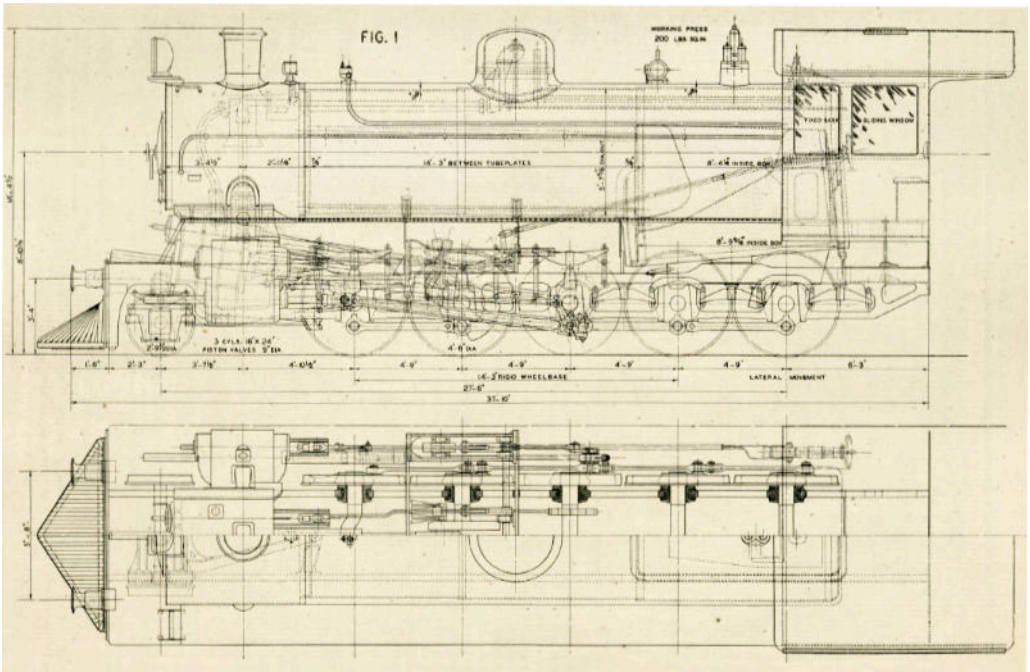
This may have been a slightly earlier proposal than the others, for this design has plate frames like most earlier CUR locos rather than the bar frames that presumably draw on Dewhurst's earlier experience in Colombia, but it can be seen from the blueprint that thermic syphons were proposed for the firebox as in the T1 class, so not all was traditional.



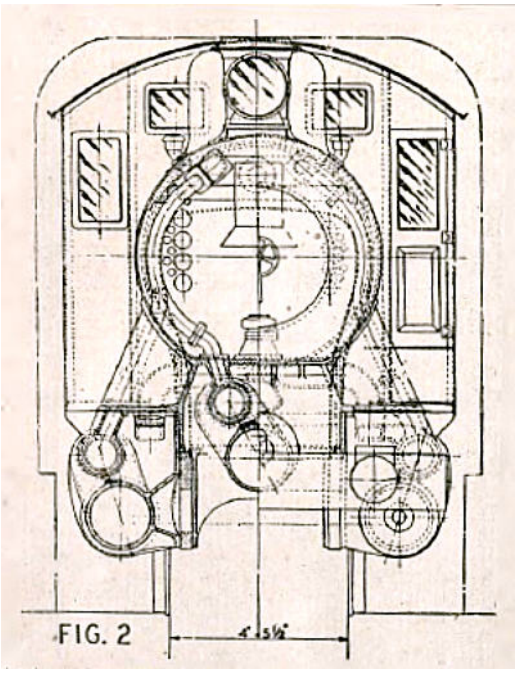
Proposed class V 2-10-0

Three-cylindered, bar frames.





Drawings of the proposed class V as displayed in *The Locomotive* issue of 15th May 1946.



Nationalisation

The British-owned railways in Uruguay were taken over by the government in 1949. Whilst this might seem to have been provoked by the much more aggressive nationalisation of British and French-owned rail systems next door in Argentina the previous year (and by Britain's own railway nationalisation during the same period), in fact it was also driven by the British government's wish to settle debts to overseas governments that had been incurred during the Second World War. A simple way of doing this was in effect to exchange British ownerships of assets such as railways for the cancellation of debt.

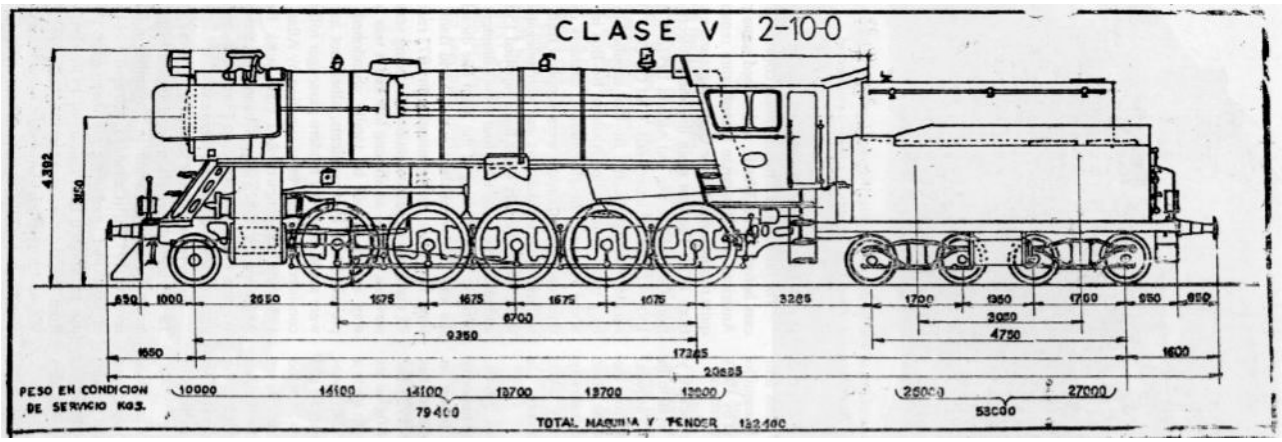
Whilst the state take-over took effect on 31st January 1949, the Uruguayan government took its time to plan its next moves and thus the railways continued much as before until the major re-organisation that came into effect in 1952.

Class V

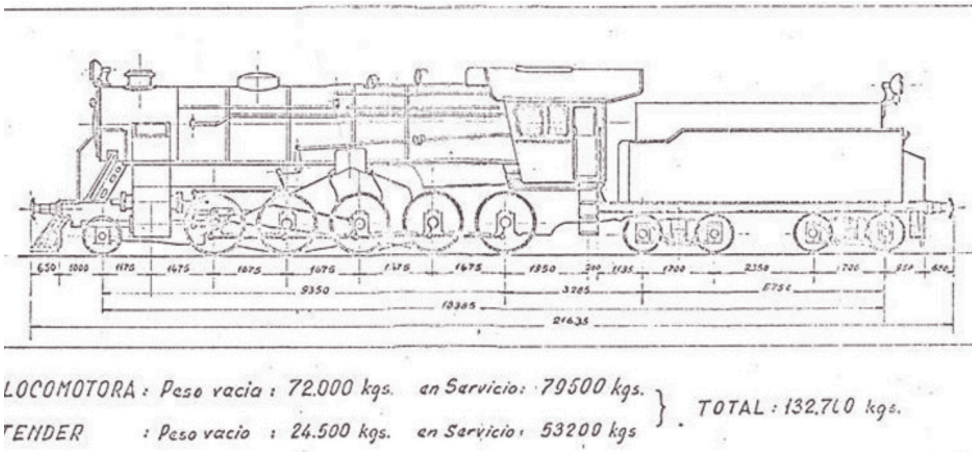
2-10-0 d/w 1525mm, cyls. 530x660mm, built by Henschel in 1950

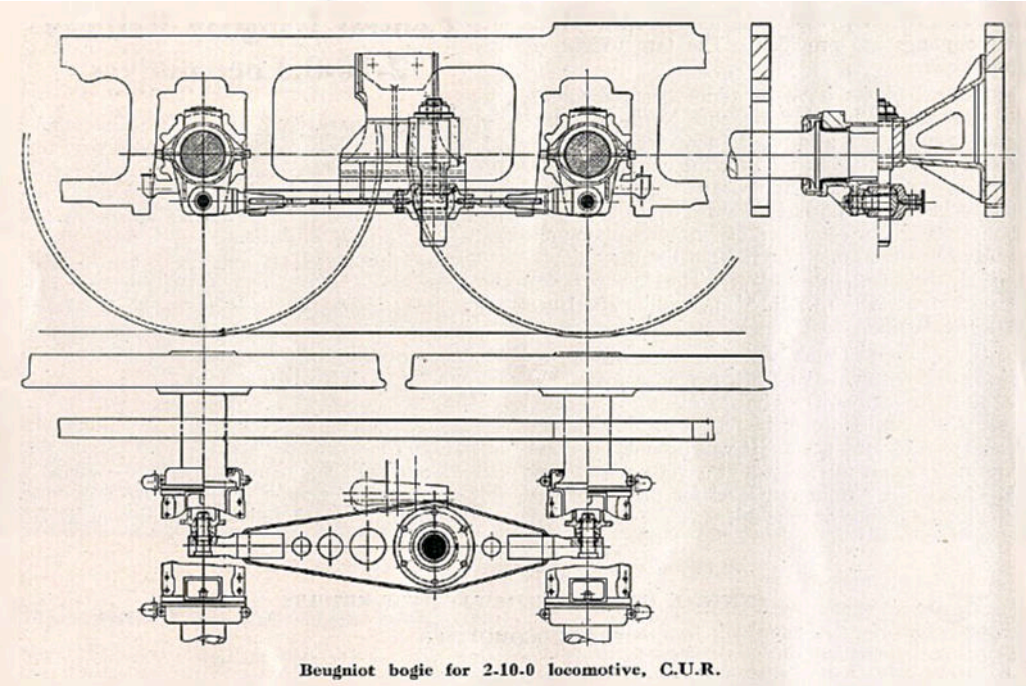
Max15 ton axle-load. Side play on final two axles. Had to have low axle-loading and short wheelbase to fit on existing turntables. Argentina's *FCNGU* locos built later were based on these, but with tenders that were 800mm longer between the bogie pivots. Krauss Helmholtz truck at front and Beugniot bogie on rear two driving axles. Could only work to Mercedes, Minas, Paso de los Toros and Nico Pérez, as they were the only destinations with 60' turntables. Extremely piercing whistles. Various problems, related to boiler design and the trailing articulation. Also the weight was at the limits of what could be accommodated by many bridges. Front end regulator and also screw reverse. 1969 all concentrated at Carnelli and with **156** being cannibalised to keep others running.

156	w/n 25052	Side-lined by 1971. Scrapped at Carnelli in 1979.
157	w/n 25053	Side-lined by 1971. Scrapped at Carnelli in 1979.
158	w/n 25054	Last one in service, until 1977. Steamed one last time in 1979. Survives at Peñarol 2005.
159	w/n 25055	Worked into 1970s. Scrapped at Carnelli in 1979.
160	w/n 25056	OoS by 1971. Scrapped at Carnelli in 1979.

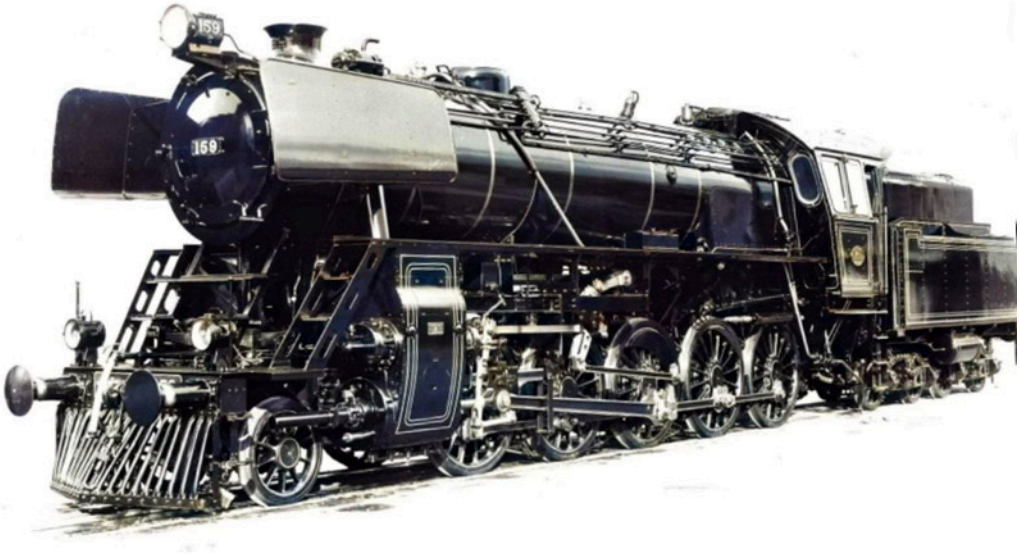


The diagram above is of the Uruguayan class V, whilst that below, shown here for comparison purposes, is of the Argentine *FCN Gral. Urquiza* locos, which were similar but had a slightly longer tender and no smoke deflectors.




Beugniot bogie for 2-10-0 locomotive, C.U.R.

The Beugniot bogie encompassing the two rearmost driving exles of these engines, as shown in *The Locomotive* issue off April 15th 1952.



A Henschel builder's photo of no. **160** of the Uruguayan batch.

9.1.6 The CUR extension railways

The general context

It will be obvious that Uruguay had a large number of railway schemes. Those listed above survived long enough to become established and in most cases to run independently for a substantial numbers of years. Others were less fortunate. Several of these were rescued by the CUR working in conjunction with British investors. They effectively became subsidiaries of the CUR and eventually were merged into that operation. These are covered in this section. Others, rescued by the Uruguayan government, are covered in later pages.

The Eastern Extension Railway

Background

This railway began in 1889 when the Eastern Extension company was set up by the CUR to administer a government concession intended to create a railway from Toledo north-eastward toward the Brazilian frontier. The route from Toledo to what became the junction station of Nico Pérez opened in 1901. The line onward to Melo then opened in 1909, but the proposed extension to Brazil was put on hold whilst a branch from Nico Pérez to Treinta y Tres was built and completed in 1911. In the long term it was the latter branch which eventually was extended to the border at Río Branco, but that was under the supervision of the *FTE* during the mid-1930s.

Possible Beyer Peacock designs in 1889

A BP drawings list archived at SIM in Manchester, pp53-54, shows two possible designs for this company: the first was an 0-6-0T with d/w 48", cyls. 14x20". The second was a compound 4-4-0 wiith d/w 60", cyls. 16/23x22", 33" leading bogie wheels, and 36" wheels for the tender bogies. Clearly neither design was built, though the 4-4-0 would seem to have been almost identical to the RS locos listed immediately below.

Class C

4-4-0 d/w 60", cyls. 16/23x22", built by Robert Stephenson in 1891

Ordered for CUR, though Dewhurst records the owners of nos. **49-52** as the Eastern Extension Railway. Bogie tender. b/p 170lbs.

49	w/n 2707
50	w/n 2708
51	w/n 2709
52	w/n 2710

Class G-3

2-6-0 d/w 54", cyls. 17½/25x24", built by Robert Stephenson in 1891

Ordered for CUR. One list from Dewhurst confirms these were 2-6-0 and mentions that they had bogie tenders. It also says that these four locos came from the Eastern Extension Railway. BP 170psi.

53	w/n 2701
54	w/n 2702
55	w/n 2703
56	w/n 2704

Annual reports to shareholders throughout the 1890s consistently reported the presence and operation of the above eight locomotives.

The Northern Extension Railway

Background

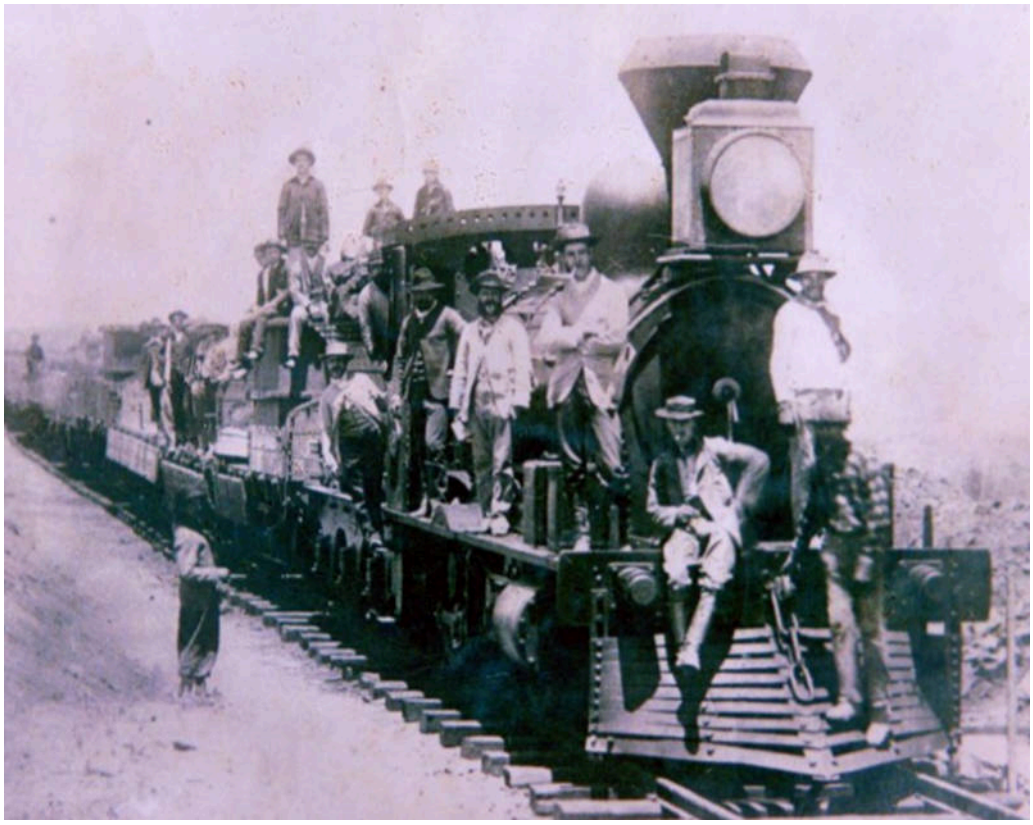
In1888 the government granted a concession for a railway extending northward from the CUR terminus at Paso de los Toros, crossing the Rio Negro and heading through Tacuarembó toward the Brazilian border at Rivera. The CUR then organised the Northern Extension Company to take on the financing of this task. The line includes Uruguay's only railway tunnel, almost 800' long. The Northern Extension was worked by the CUR, and the extension company may have eventually sold its assets to the parent CUR company and then been wound up, though a proposal to that effect in 1912 was rejected by the courts.

The contractor apparently used Black Hawthorn 0-6-0Ts 922 and 923 from the Midland railway, with no. 923 definitely returned at the end of the contract [1].

In 1913 a 2½ mile extension extended the route into Brazil to meet the *EF Rio Grande do Sul* metre gauge system.

2-6-0 d/w 54", cyls. 9½/25x24", built by Beyer Peacock in 1889

Probably delivered with CUR numbers.	w/n 3033	Became CUR no. **31**.
Probably delivered with CUR numbers.	w/n 3034	Became CUR no. **32**.
Probably delivered with CUR numbers.	w/n 3035	Became CUR no. **33**.



A Northern Extension Railway construction train, with a wood-burning loco, possibly one of the three BP 2-6-0s. Note the rudimentary front buffers.

0-6-0T d/w 42", cyls. 11x17", built by Manning Wardle in 1889

It must be presumed that the number plates on the tank bearing **E7N** and **E8N** represented 'EXTENSION **7** NORTE' or something of the kind. MW type: Special. Both despatched 29/10/1889.

E 7 N	w/n 1148	Became CUR no. **43**.
E 8 N	w/n 1149	Became CUR no. **44**.

Annual reports to shareholders throughout the 1890s consistently reported the presence and operation of eight locomotives, listed as three 6-coupled goods engines, three 6-coupled compounds, and two small shunting engines. The first group of three is not listed above, and needs to be identified.

The Western Extension Railway

Background

This one had a rather more complex history than the other two extension railways:

• The Higueritas Railway Co. was set up in the early 1870s to link Montevideo to Higueritas (nowadays Nueva Palmira). The enterprise reached San José but then failed and was subsumed within the CUR.

The *FC Central Uruguayo e Hygueritas* garter badge as seen on an original carriage-side transfer in the collection of Gerald Hartley.

• Then in 1889 the *FFCC del Oeste del Uruguay*, was set up under the supervision of Uruguay Ltd., now with the aim of reaching Colonia rather than Higueritas. This scheme rapidly failed when Sr. Bowen, the holder of the concession, was caught out in a fraudulent attempt to purchase the *FC y Tranvía del Norte*. The company had built no track but had purchased nine locomotives from Baldwin. In view of the complex financial situation the locos were stored at Puerto del Sauce and at Montevideo for a long period, and thus were not available for use by the next concessionaire, though they did eventually enter the fleet of the CUWE Co. at the turn of the century.

• In 1896 the government hired *Medici y Lacaze*, who already had a concession to develop the Puerto del Sauce, to continue the works. They commenced work under the title of the Uruguay Western Railway & Port, naturally from their base at Pto. del Sauce, though no doubt with their own motives behind that decision, and reached San José via Mal Abrigo in 1898. However, their financial situation by then was such that they could not contemplate operation of the line.

• In August 1899 therefore the concession was taken over by the CUR under the aegis of the Central Uruguay Western Extension Co. Ltd. Sres. Medici y Lacaze retained the port at Puerto del Sauce. See [18]. The Western Extension

Company continued the construction work, striking off from Rosario to Colonia and from Mal Abrigo north-west all the way to Mercedes.

Higueritas Railway Company locomotives

2-4-0 d/w 54", cyls. 14x20", built by Beyer Peacock in 1874

Ordered for Waring Brothers, Montevideo, Uruguay. BP 120 psi. 4-wheeled tender.

'SAN JOSÉ'	w/n 1424	Became CUR no. **17**.
'HYGUERITAS'	w/n 1425	Became CUR no. **18**.

These became the property of the CUR around 1886, and were later designated class F. Both were withdrawn between 1905 and 1910.

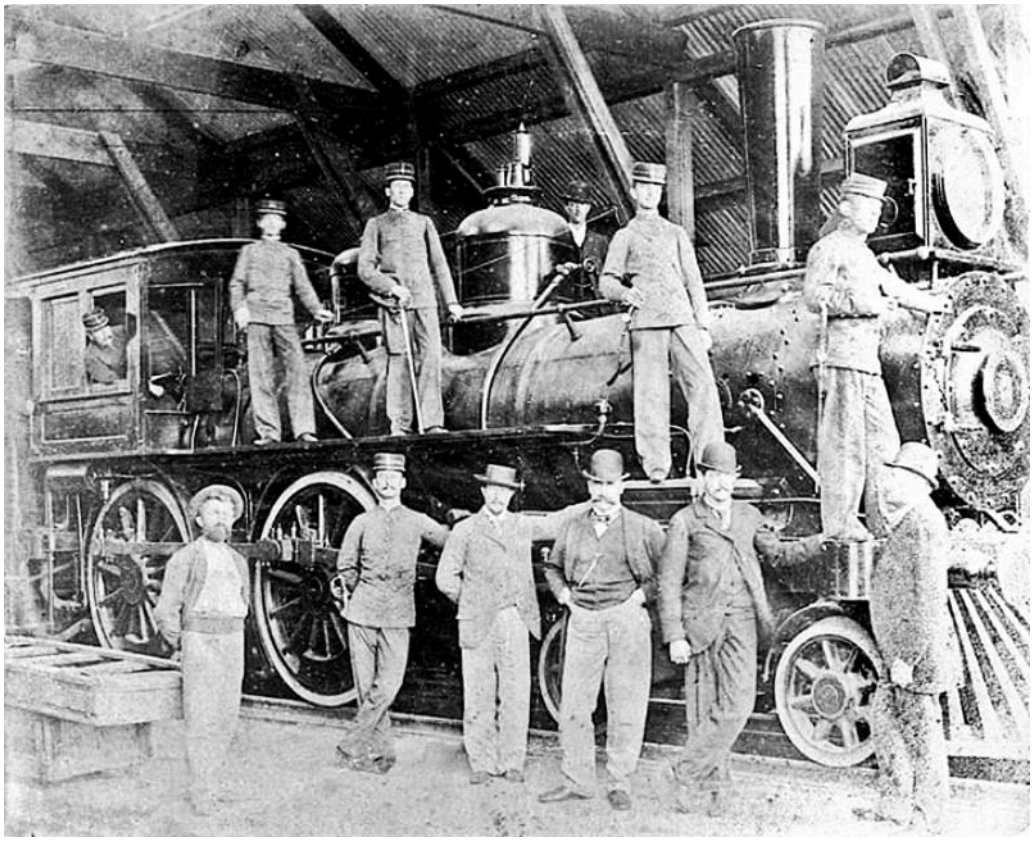
FFCC del Oeste del Uruguay locomotives

4-4-0 d/w 62", cyls. 15x24", built by Baldwin in 1890

Ordered via Olcott & Co. Numbers in brackets are as suggested by P. C. Dewhurst. Class 8-24C nos. 156-158. Spec. is in vol. 15 p 197. Tender to be lettered 'FERRO-CARRILES DEL OESTE DEL URUGUAY'. Locos to be numbered **1-3**, presumably in construction number order. Some locos were unloaded and erected at Colonia, as that was where the railway was being built from.

1 (**8**?)	w/n 10411	Became CUR no. **86**.
2 (**9**?)	w/n 10412	Became CUR no. **87**.
3 (**1**?)	w/n 10417	Became CUR no. **79**.

The tender bears the number **2**, clearly suggesting that this is one of the three smaller-cylindered locos. It will also be noted that the steam dome is mounted well forward and in front of the sand dome on a straight-topped boiler.



When found on Facebook this picture was captioned as showing one of the smaller Taunton 4-4-0s of the *FC Nordeste*, later CUR nos. **38-41**. However, I believe it to be one of these three smaller Baldwins from the *FFCC del Oeste del Uruguay*. The boiler mountings and other details are very different from those on the Taunton machines. In particular you will note that the steam dome is ahead of the sand dome.

4-4-0 d/w 62", cyls. 17x24", built by Baldwin in 1890

Ordered via Olcott & Co.. Numbers in brackets are as suggested by P. C. Dewhurst. Class 8-28C nos. 750-755. Spec. is in vol. 15 p 185. Tender to be lettered 'FERRO-CARRILES DEL OESTE DEL URUGUAY'. Locos to be numbered **4-9**, presumably in construction number order.

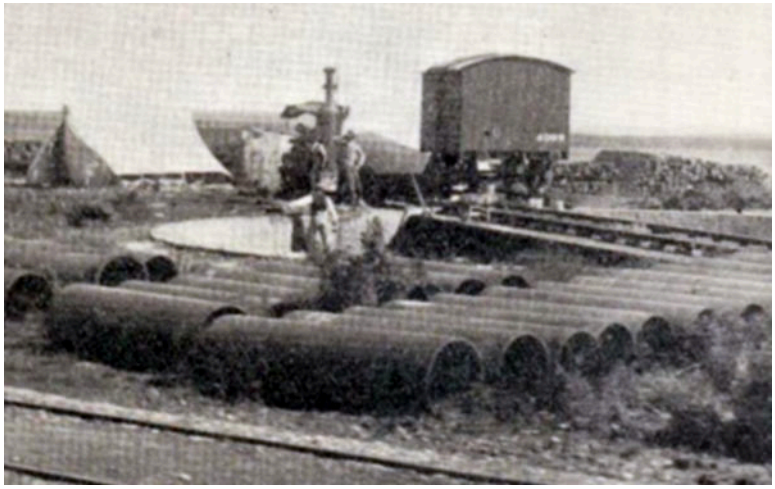
4 (**2**?)	w/n 10485	Became CUR no. **80**.
5 (**4**?)	w/n 10486	Became CUR no. **82**.
6 (**7**?)	w/n 10487	Became CUR no. **85**.
7 (**3**?)	w/n 10488	Became CUR no. **81**.
8 (**5**?)	w/n 10489	Became CUR no. **83**.
9 (**6**?)	w/n 10491	Became CUR no. **84**.

WER no. **9** seen in a Baldwin builders' photo. Hi-res versions available from the Railroad Museum of Pennsylvania, as BLW negative no. 00431. Unlike the smaller locos, nos. **4** to **9** had wagon-top boilers with a characteristic rise

towards the cab, and the steam dome was aft of this rise, above the firebox.

A Merryweather inspection car?

The photo below, taken at Mal Abrigo during the construction of the *FFCC del Oeste*, seems to have a small vertical-boilered object to the left of the van. Its general shape, and the suggestion of a front seat canopy beyond the chimney, brings to mind the Merryweather inspection cars supplied to the *FC Trasandino*. There is no complete list of those vehicles built by Merryweather so the suggestion cannot easily be checked.



Medici y Lacaze Uruguay Western Railway and Port standard gauge locomotives

0-6-0ST d/w 42", cyls. 11x17", built by Manning Wardle in 1870

Ordered for Uruguay Co., Montevideo, presumably for *FC Central*. BP 120 lb/in 2, TE ?lb, wt about 17 tons. MW notes for no. 300 state "same as 235 except that the canopy is to have a weatherscreen at the front instead of being open." Purchased from the CUR in 1896?

2 'CANELONES' w/n 300

Returned to the CUR fleet possibly in 1899 and was then designated as class A.

0-6-6-0 Fairlie d/w 36", cyls. 11x18", built by James Cross of St. Helens in 1868

Originally built for the 3' 6" gauge Southern & Western Railway of Queensland (unwisely without the involvement of Robert Fairlie). Rejected as un-satisfactory and returned to the UK. Rebuilt and regauged by the YECo. as their order no. 2007. Arrived in Uruguay 1874. Purchased from the CUR in 1896?

16[1] w/n 30 Returned to CUR fleet possibly in 1899 and was then scrapped.

The remains of one of these two Fairlies were reported to lie still at Peñarol works in 1909 [].

0-6-0T d/w 42", cyls. 11x17", built by Manning Wardle in 1890

Ordered for CUR, Montevideo via BsAs. Fitted with vacuum brakes. MW type: Special. Despatched 22/09/1890 and 22/10/1890. Was originally **'MERCADO CENTRAL de FRUTOS DEL URUGUAY No. 1'** but was sold when the market company went out of business.

1[2] w/n 1197 Probably returned to CUR fleet around 1899.

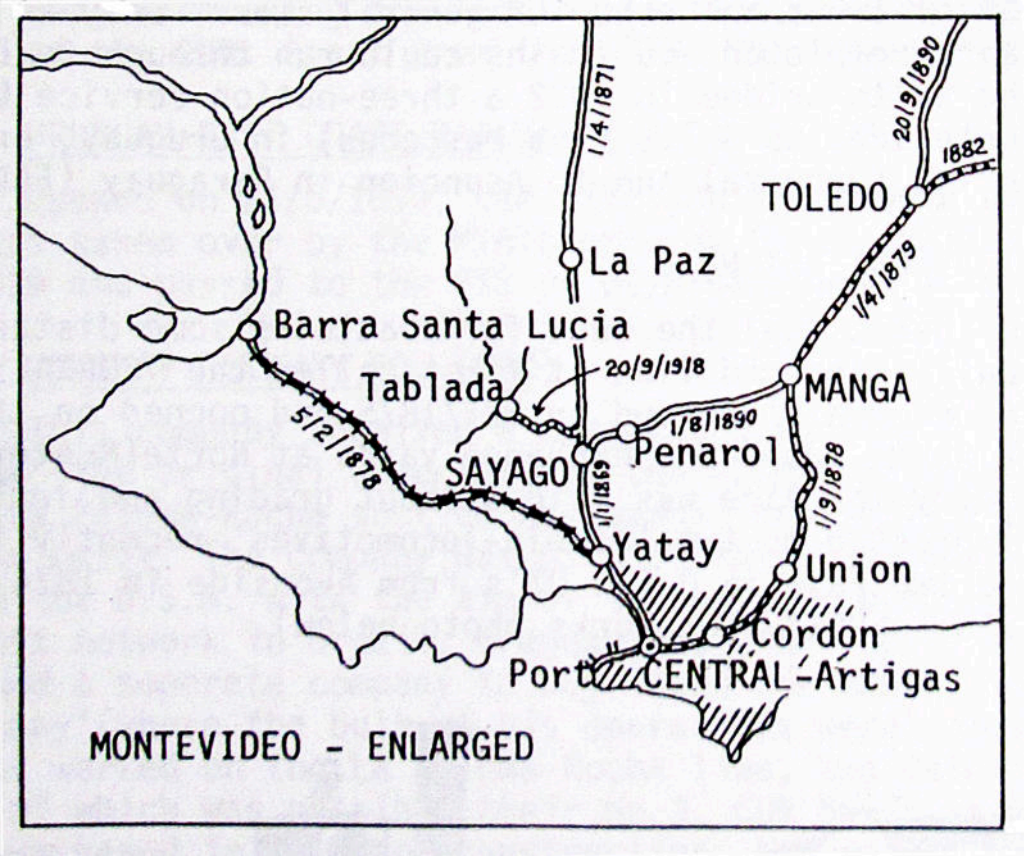
Central Uruguay Western Extension Company Ltd. locomotives

It seems likely that all of the above locos ended up in the CUR's possession as each of their owning companies handed over their assets either directly to the CUR or to the Western Extension Co. Some sources suggest that the extension companies' locos were not merged into the main CUR number series until several years later.

9.2 Standard gauge public railways – Government-owned

9.2.1 *El FC y Tranvía del Norte de Montevideo*

1871- 1915



Source of map unknown. I will be happy to acknowledge the cartographer if I discover who it was.

Background

The initial purpose of this railway was for the transport of meat from the new 1870s slaughterhouse at the Barra de Santa Lucía into the city of Montevideo. However, passengers were also carried. This was effectively a 20 km. tramway, and loops were provided to permit steam trains to overtake horse-drawn trams. There were meat trams as well as more conventional passenger cars. A traffic in sand also began, from a sandpit (with 60 cm gauge railway) on the far side of the San José river. A cable-carril brought the sand across to Santiago Vasquez where it was loaded on to rail wagons.

Note that the route ran out north-west of Montevideo rather than due north, and that the terminus can be found more easily by searching for Santiago Vasquez on a map, rather than Santa Lucía which tends to point the searcher to the unrelated town of Santa Lucía about 50 km. north west of Montevideo.

The owning company reached a crisis in 1915 and was taken over by the state. In the 1930s the rail tracks were extended over a new bridge to the far side of the river. By 1926 the passenger service had been transferred to an electric tram service provided in conjunction with the Transatlantica company. The last tram to the Barra ran in 1957.

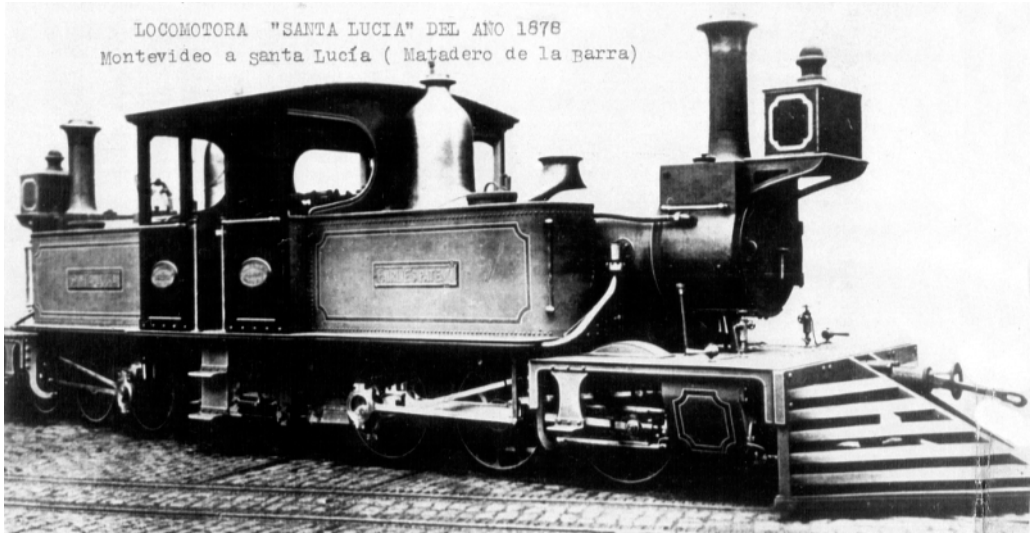
0-6-6-0 Fairlies d/w ?, cyls. 11x16", built by Avonside in 1874

An hypothesis put forward by Chris West is that these engines were originally ordered for the North Western Railway, a much longer route and more suited to such machines, but that financial problems meant they were left on the quayside until sold cheaply to the *FC y Tranvía del Norte*. Certainly it is difficult to understand why a short inter-urban line would have wanted Fairlies. See section 9.1.1 on the North Western Railway for more on this possibility. Donald Binns pointed out that this railway opened only in 1878, so it might be that the engines had sat on a dockside some-

where until purchased for this line.

'MONTEVIDEO'	w/n 1032-3	) Presumably withdrawn before 1915
'SANTA LUCIA'	w/n 1034-5	) as not recorded in *FTE* fleet.

Source [19] states that these Fairlies were both withdrawn in 1908, but that one of them remained in reserve.



Note the typical River Plate style of wooden cowcatcher, and the annular sandboxes around the chimney bases as fitted to a number of Robert Fairlie's designs.

This photo of one of the Fairlies on a train seems to show that the cowcatchers had been removed.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

Ordered via J. Perry & Co. for Midland Uruguay Railway. One of the pair was retained by contractor for use on the CUR Northern Extension Railway after the Midland railway construction had been completed. Purchased by *FCTNM* in 1892.

'QUEGUAY'	w/n 922	Became *FTE* no. **14**.

The fleet in 1893

The government volume of statistics for 1893 states that the *FC del Norte* had two locomotives in its fleet in 1892 and three in 1893 [37].

2-6-0T d/w 40", cyls. 15½x20", built by Beyer Peacock in 1903 and 1905

'ABASTO'	w/n 4560	Became *FTE* no. **12**.
'MONTEVIDEO'	w/n 4734	Became *FTE* no. **3**.

2-6-2T d/w 40", cyls. 16½x20", built by Beyer Peacock in 1909

‘PROGRESO’ w/n 5324 Became *FTE* no. **15**.

This railway initially used Norwegian chopper couplings.

9.2.2 Uruguay Great Eastern Railway

1890-

Uruguay East Coast Railway Co.

1907-1919

Background

Built by Perry Cutbill de Lungo & Co., who had built several Uruguayan lines, but who then went bankrupt in 1891 after a Uruguayan financial crisis. Re-invigorated in 1907 by the Farquhar Syndicate under the Uruguay East Coast Railway Co. name. Incorporated into the *FTE* in 1919.

0-4-0ST d/w 39", cyls. 12x19", built by Black Hawthorn in 1890

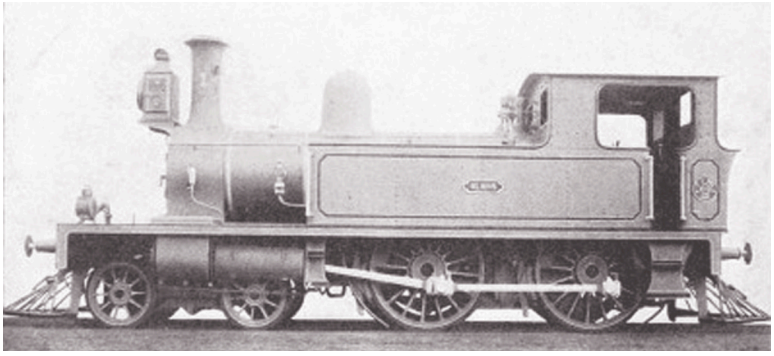
Ordered by Perry Cutbill de Lungo for Uruguay Great Eastern Railway.

13 w/n 997

4-4-0T d/w 63", cyls. 16x22", built by Dübs in 1891 but not delivered.

Sold on to the Highland Railway in Scotland, (possibly as a result of the bankruptcy of PCdL), which then purchased three more of the type. It is not clear whether all five had originally been intended for Uruguay or whether the later three were a new order placed directly by the HR. Those later engines were Dübs 3077-3079 of November 1893.

(**1 'OLMOS'**)	w/n 2778	Became HR no. **101**, then LMSR no. **15013** in 1923. Withdrawn 1934.
(**2 '?'**)	w/n 2779	Very possibly was to be named **'MOSQUITOS'**. Became HR no. **102 'MUNLOCHY'**, then LMSR no. **15014** in 1923. Withdrawn sometime 1924 to 1934.



No. **1 'OLMOS'** is pictured ready for delivery. However, these actually went to the Highland Railway in Scotland, where they were used on the Burghead, Black Isle, Portessie and Fort George branches.

Their Highland Railway history

The Locomotive magazine. March 7, 1903, p170, tells the story of these engines' lives.

"AMERICAN TYPE LOCOMOTIVES ON THE HIGHLAND RY. -

THE annexed illustrations represent the engines of class P, on the Highland Railway. These engines, five in number, are locally known as the " Yankees " and have a somewhat interesting history. They were built by Messrs. Dubs & Co., Glasgow for the Ferro Carril Nordeste del Uruguay (Uruguay North Eastern Railway) [Incorrect. MCC] in 1892, but owing to a misunderstanding were not delivered to the South American Company, and in 1893 the Highland Railway, being in want of tank engines, bought them. The first two delivered were numbered **101** and **102**, and had been finished to the South American Company's specification ; they have in fact "F. C. N. del U." stamped on the motion, &c. [?, MCC. Almost certainly not true. See below.] The handrails are cased with brass, while the cabs are ventilated as

for a hot climate, and the ends of the crank pins are protected from sand and dust by brass caps. The chimney tops are of polished copper and of a different pattern to any other engines on the Highland Railway. These engines have the slide valves above the cylinders, operated through rocking shafts, as is usual in American practice, and are the only locomotives possessing this feature on the line. The remaining three engines, not being so far advanced when bought, were finished in a manner more in accordance with the H. R. standard, though retaining the Ramsbottom safety valves. These three were numbered **11, 14** and **15**, replacing three old Inverness and Nairn Ry. goods engines built by Fairbairn. Our illustration shows No. **14** as it appeared prior to 1899, when Mr. Drummond renumbered the engines **51, 50** and **52** respectively, which numbers they still retain. The coupled drivers of these engines are 5-ft. 6-in, diameter. The coupled wheelbase is 7-ft. 2-in., while the total wheelbase is 20-ft. 3-in., and the total length of the engine 31-ft. 1 -in. The cylinders are 16-in. diameter by 22-in. strokes The boiler has a total heating surface of 883 sq. ft.. the tubes giving 795 sq. ft. and the firebox 88 sq. ft., whilst 14 sq. ft. of grate is provided. The working steam pressure is 140 lbs per sq. in. The centre line of the boiler is 6-ft. 8-in. from the rail. The tractive force is 9557 lbs. and the weight in working order 42 tons. The tanks of Nos. **101** and **102** carry 700 gallons of water, while Nos. **50** to **52** carry 900 gallons. They are exceptionally smart and quick running engines ; two of them are at present working on the Alves Junction and Hopeman branch, one on the Black Isle section, one on the Thurso branch, and one on the Buckie and Keith section.

A later article in *The Locomotive*, in May 1917, expanded upon those details:

THE HIGHLAND RAILWAY AND ITS LOCOMOTIVES.

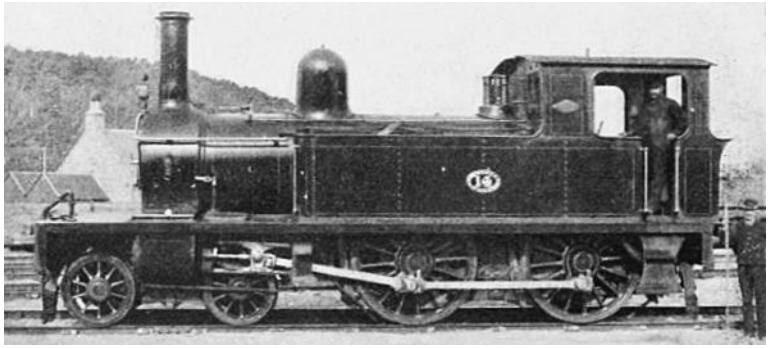
(Continued from page 49).

IN the year 1891 Messrs. Dubs & Co. constructed two four wheels coupled leading bogie side tank engines for the Uruguay Eastern Railway, the first of which was numbered **1** and named **" Olmos "** (Fig. 31). This Company, however, did not accept delivery and the engines were thrown on the hands of the makers, from whom they were purchased by the Highland Railway in the following year. Three other engines, of practically the same design, but finished in accordance with the H.R. standards (Fig. 32), were afterwards built for them by the same makers, the whole forming a class of five, commonly called the " Yankees," but officially styled class P, and were delivered as follows :—

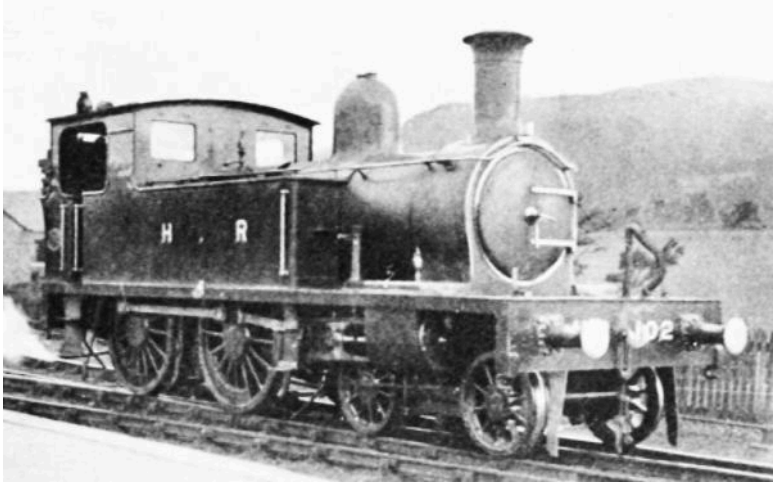
Engine No.	Maker.	Makers' No.	Date new.
101	Dubs & Co.	2778	Sept., 1892
102	"	2779	"
11	"	3077	Nov., 1893
14	"	3078	"
15	"	3079	"

The cylinders, which were outside and inclined at an angle of 1 in 25, had a diameter of 16 in., a stroke of 22 in. and were 6 ft. 2 7/8 in. between centres. Other dimensions were : Diameter of coupled wheels, 5 ft. 3 in. ; diameter of bogie wheels, 3 ft. 0 in. ; bogie wheelbase, 5 ft. 9 in., from bogie pin to centre of driving axle, 10 ft. 2 in. ; distance between coupled centres, 7 ft. 2 in. ; total wheelbase, 20 ft. 3 in. ; total length over buffers, 31 ft. 1 in. ; length of boiler barrel, 10 ft. 6 in. ; diameter of ditto, 3 ft. 11¾ in. ; height of centre line, 6 ft. 8 in. ; length of outside firebox, 4 ft. 10 in. ; number of tubes, 150 ; working pressure, 140 lb. per sq. in. ; grate area, 14 sq. ft. ; heating surface, tubes 795 sq. ft., firebox 88 sq. ft., total, 883 sq. ft. The slide valves were on the top of the cylinders and were actuated through the medium of rocking shafts. Nos. 101 and 102 had a tank capacity of 700 gallons and weighed 41 tons 12 cwt., but the three later engines carried 900 gallons of water and weighed 42½ tons, of which 13½ tons were on the bogie and 14½ tons on each of the coupled axles. With the exception that the cow-catchers and American pattern headlights were dispensed with and the name and number plates replaced by number plates of the H.R. standard type, engines Nos. **101** and **102** were delivered practically as built for the Uruguay Eastern Railway, the deep copper top to the chimneys, brass handrails and Ramsbottom safety valves over the firebox being all retained; whilst on parts of the motion may still be seen the letters F.C.U. DEL E. It was thought that the covers over the slide-bars would prove serviceable on the Burghead branch where so much drifting sand has to be contended with, but owing to the inconvenience of being unable to get at the crossheads without removing the covers it was found preferable to dispense with them. All the class were fitted with the automatic vacuum brake and two of them are regularly employed on the Burghead branch, whilst

there is usually one on the Black Isle and another on the Portessie branches. Since its opening the Fort George branch has generally been worked with one, whilst during the period it was under Highland Railway management, one was always on the Invergarry and Fort Augustus Ry. In November, 1899, No. **11** was renumbered **51**, whilst in 1900 Nos. **14** and **15** became **50** and **52** respectively, and in 1901 No. **50** was again altered to **54**. For some time Nos. **52** and: **54** carried the names **" Fortrose "** and **" Portessie,"** respectively, but after they ceased working on the branches to those places their names were removed. In 1906 No. **102** was rebuilt at Inverness with a larger boiler, mountings and chimney of Mr. Drummond's usual design (Fig. 33) and at the same time the tank capacity was increased to 900 gallons. It was then sent to work on the Aberfeldy branch, but a few years later was transferred to the Black Isle section and was then named **" Munlochy."** ”



No. **14** of the Highland Railway. Comparison with the previous photo showing *FCUdelE* no. **1 'OLMOS'** ready for delivery, will show the removal of the cow-catchers and slide-bar covers, the different chimney, and the relocation of the works plates to the upper cabsides.



No. **102 'MUNLOCHY'**, originally completed as *FCUdelE* no. **2 'MOSQUITOS'**(?), is seen here after rebuilding in 1906.

4-4-0 d/w 61½", cyls. 15½x22", built by Hawthorn Leslie in 1895

Ordered June 1894 via A. L. Secretan for Uruguay State Railways. Delivered Jan 1895. Tenders numbered 969-970, with capacity 1800 gallons. Numbers and names explicitly set out in order book.

1 'OLMOS'	w/n 2320	Became *FTE* no. **1**.
2 'MOSQUITOS'	w/n 2321	Became *FTE* no. **2**.

Missing number

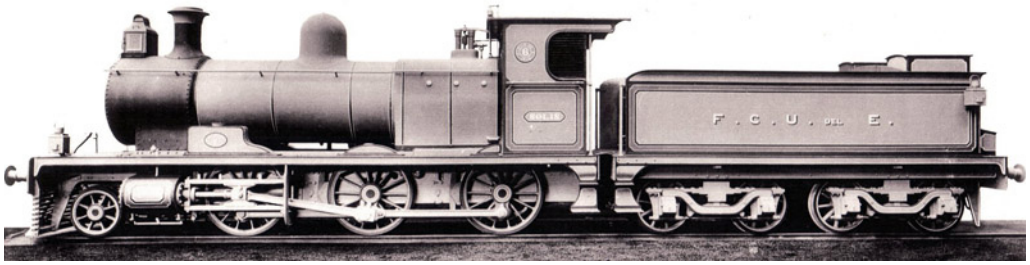
Was there a loco number **3**?

2-6-0 d/w 54", cyls. 17x24", built by Hawthorn Leslie in 1907, 1910, 1911 and 1914

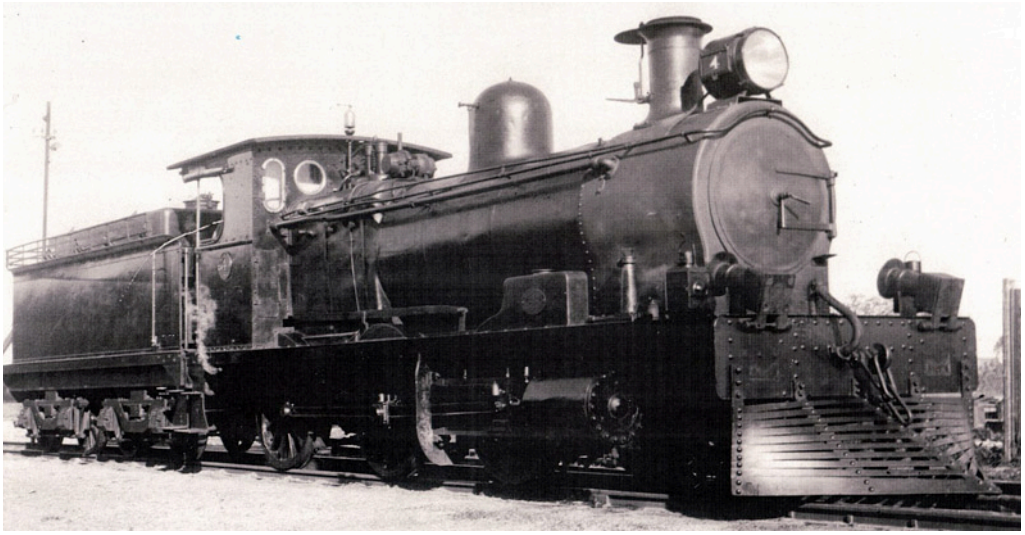
Built for the Uruguay Eastern Railway, or the Uruguay East Coast Railway. R&WH order book 3 has 'Uruguay Great

Eastern Rly. Co.' but over-written as 'Uruguay State Rly.' for the first one, and delivered April 25th? 1907. Tender was 2700 gallons, and (cabside?) plates to read 'No. 4 (top line), SAN CARLOS (middle line) and F.C.U.E. (bottom line). Second engine ordered December 1909, and delivered 10th May 1910. Name-plates on cab and circular 'FCU del E 1909' plate with a 6 in the centre, presumably on smokebox or back of tender. Third loco ordered 18th January 1911 via Secretan & Co. for Uruguay E. C. Rly. Co., and delivered 26th July 1911. Tender 2700 gallons numbered 1081. Similar circular number plates to earlier engines. Last loco ordered 2nd June 1913, via A. L. Secretan & Co. Delivered 24th January 1914. Engine to be practically a duplicate of 2873. Tender no. 1134. Plates as before.

4 'SAN CARLOS'	w/n 2693	
6 'SOLIS'	w/n 2816	Replacement boiler ordered for this engine from Hawthorn Leslie in 1928.
7 'MALDONADO'	w/n 2873	
8 'ROCHA'	w/n 3033	



Whilst the **'SOLIS'** name-plate is clearly visible on the cabside in this builders' photo, closer examination will also reveal the circular number-plate above it, reading **6** in the centre and '*FCU del E* 1909' around the outside.



2-6-2T d/w 45", cyls. 15x22", built by Hawthorn Leslie in 1908

Built for the Uruguay Great Eastern Railway. Delivered December 1908. R&WH order book 3 specifies name and sketches circular number plate with 5 in centre and 'FCU du E 1?08' around edge (probably 1908 was meant).

5 'PAN DE AZUCAR' w/n 2759

0-6-0ST d/w36" cyls. 11x17", built by Manning Wardle in 18??, rebuilt by Hudswell Clarke in 1892

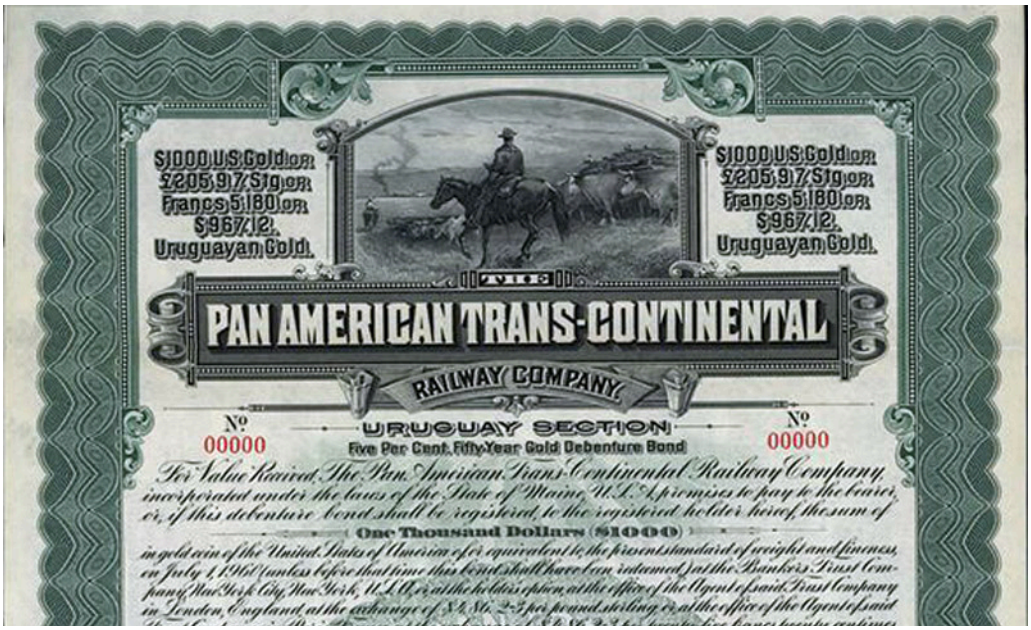
Original users unknown, but purchased in 1909 from Argentina for use on construction work to Maldonado. Information solely in a PCD letter to John Poole, November 27th 1942.

? w/n ?

9.2.3 The Pan American Trans-continental Railway Co.

Background

Around 1890 a proposal arose to link the port of Colonia north-eastward all the way to the Brazilian border, a scheme which would thus provide links between most of the other Uruguayan railways radiating from Montevideo. This *FC Interior del Uruguay* scheme succumbed to the financial crisis of the 1890s, but the idea was resurrected by American interests at the end of the decade. It took until 1909 for all the necessary legal procedures to be completed, and then PATCO began to order materials, five locos and some impressive rolling stock. In 1913 work started from Durazno toward Trinidad but further financial and legal problems held up progress. Then the outbreak of the First World War made it impossible to find further finance. The end result was that the Uruguayan government took over in 1915, with the *Ministerio de Obras Públicas* completing the works of what became merely a branch off the CUR mainline, and one which necessarily was worked separately as all the stock had American knuckle couplers and no automatic brake of any kind. [28]



0-4-2T or 0-4-0T d/w 36", cyls. 12x18", built by Lima in 1911

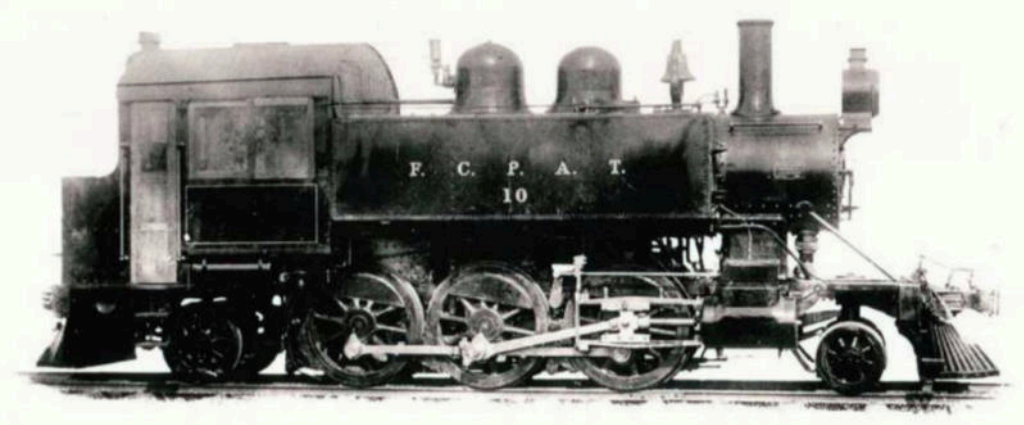
Ordered for 'Pan American' according to Connelly's Lima list. [1] says 0-4-2T and w/n 1075 but the Lima list says 0-4-0T and that running number was to be **1**.

1	w/n 1154	Became *FTE* no. **19**.

2-6-2T d/w 50", cyls 15x20", built by Lima in 1911

Ordered for 'Pan American' according to Connelly's Lima list.

2?	w/n 1155	Became *FTE* no. **10**.
3?	w/n 1156	Became *FTE* no. **11**.

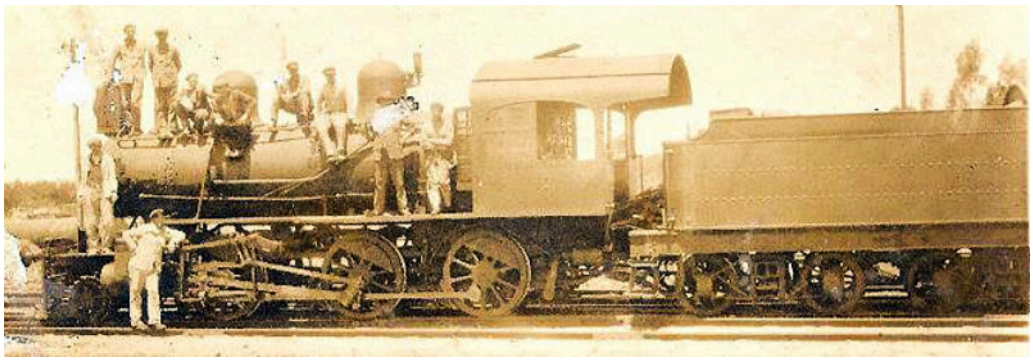


The tankside lettering suggests that this loco was renumbered **10**
whilst still under the ownership of the *FC Pan-American Trans-Continental*.

2-6-0 d/w 50", cyls. 15x24", built by Lima in 1911

Ordered for 'Pan American' according to Connelly's Lima list.

4	w/n 1157	Became *FTE* no. **20**.
5	w/n 1158	Became *FTE* no. **21**.



One of the Lima 2-6-0s is seen later in its life, as can be seen by
the fact that side buffers have now been fitted.

9.2.4 The Uruguay Railway
El FC Puerto de La Paloma a Treinta y Tres

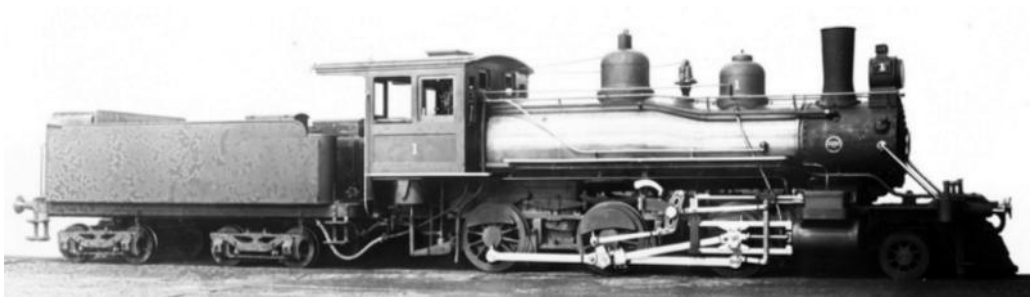
Background

From La Paloma on Uruguay's eastern coast, inland to Rocha. The Brazil Railway Co. was Percival Farquhar's instrument for the exploitation of Brazil's southern forests, and it eventually gained control of the *EFSPRG* which built the railway southward to meet the CUR at Rivera.

2-6-0 d/w 40", cyls. 16x20", built by Baldwin in 1913

Ordered via the Brazil Railway Company for the Uruguay Railway Company. Class 08-26D nos. 194-195. Spec. is in vol. 44 p 76. Walschaerts valve motion. No mark on tender, nos. **1** and **2** on front number plate and on dome. Gresham & Craven automatic vacuum brake. Screw coupling and side spring buffers. Eight wheeled tender. Extended wagon-top boiler. Gresham & Craven Automatic vacuum brake. Ordered by the Brazil Railway Co. for the Uruguay Rly. Co. and at same time as other locos for Brazil.

1 'BRASIL'	w/n 39689	Later to *FTE* as no. **16**.
2	w/n 39690	Later to *FTE* as no. **17**.



Particularly interesting in this photo is the shape of the boiler, with a steep taper up to the dome as if on a wagon-top design but in fact much further forward than usual.

0-6-0T d/w 42", cyls. 12x18", built by Kerr Stuart in 1912

Ordered for "Brazil Railway Company, La Paloma, Brazil", ie. this was for the Uruguay Railway.

3	w/n 1196	Later to *FTE* as no. **18**.

9.2.5 *Los Ferrocarriles y Tranvías del Estado (FTE)*

Background

The *FC Norte de Montevideo* (see section 9.2.1) was bought by the state in 1915. In 1919 the new line from Durazno to Trinidad constructed by the Pan American Trans-continental Railway was opened only after the state had taken responsibility, and the *FC Uruguayo del Este* and the Uruguay Railway were both eventually taken over. Whilst the government agency given charge of these separate sections of railway was much smaller than the CUR and its associated companies, it nevertheless promoted further railway construction during the 1920 and 1930s.
Given the fact that the numbering system shows a stirring in of locos from several of those railways, it would appear that the new numbers were not allocated until around 1920 or later.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

Possibly retained by contractor for use on the CUR Northern Extension Railway after the Midland Railway construction had been completed. Ordered via James Perry & Co. for Midland Uruguay Railway, and named after the two rivers which the Midland Railway crosses between Salto and Paysandú. This one had been **1 'QUEGUAY'**

14	w/n 922	Sold to *FC y Tranvía del Norte*, and then on to *FFCC del Estado*. The Hawthorn Leslie boiler book says that a replacement boiler for Black Hawthorn no. 923 was ordered by the Uruguay State Railways in 1914, but it may have actually been for this loco. Withdrawn early 1940s.

0-4-0ST d/w 39", cyls. 12x19", built by Black Hawthorn in 1890

Ordered by Perry Cutbill de Lungo for Great Eastern Railway of Uruguay.

13	w/n 997	Some sources say was named 'DADA de BAJA' but this phrase does not make sense. It may merely have been a comment that the engine was out of service which an English-speaking reader assumed was the loco's name.

0-6-0T d/w 36", cyls. 11x17½", built by Hawthorn Leslie in 1892

Ordered for Uruguay State Rly. according to the Hawthorn Leslie list that is now SLS library file WL8723. However, at that time there was no such entity. Whom did this engine first work for?

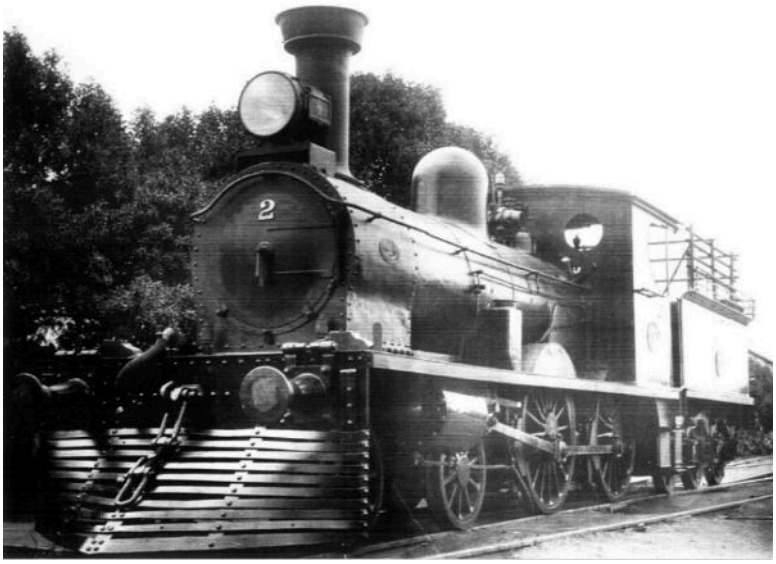
9 'VENDIDA' or **'VARDIA'**	w/n 2238

Later became *AFE* class Y-1

4-4-0 d/w 61½", cyls. ?, built by Hawthorn Leslie in 1895

Ex *FC Norte de Montevideo.*

1 'OLMOS'	w/n 2320	Moved in 1940s to the Durazno Trinidad line [8]. Became *AFE* no. **201** of class Y1 in 1952. Survived on La Tablada branch until end of 1950s.
2 'MOSQUITOS'	w/n 2321	Moved in 1940s to Florida - P. Alta [8]. Became *AFE* no. **202** of class Y1 in 1952.



2-6-0T d/w 40", cyls. 15½x20", built by Beyer Peacock in 1903 and 1905

Ex *FC Norte de Montevideo.*

3 'MONTEVIDEO'	w/n 4734	Later became *AFE* class B-2. Withdrawn by *AFE* in 1961.
12 'ABASTO'	w/n 4560	Withdrawn by *AFE* in 1961.

2-6-0 d/w 54", cyls. 17x24", built by Hawthorn Leslie in 1907, 1910, 1911 and 1914

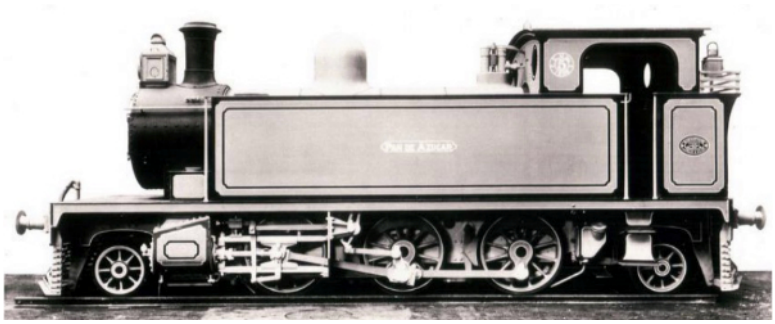
Ex *FC del Este*.

4 'SAN CARLOS'	w/n 2693
6 'SOLIS'	w/n 2816
7 'MALDONADO'	w/n 2873
8 'ROCHA'	w/n 3033

2-6-2T d/w 45", cyls. 15x22", built by Hawthorn Leslie in 1908

Ex *FC del Este*.

5 'PAN de AZUCAR'	w/n 2759	Later became *AFE* class Y no. **205**.



2-6-2T d/w 40", cyls. 16½x20", built by Beyer Peacock in 1909

Ex *FC Norte de Montevideo.*

15 'PROGRESO'?	w/n 5324	Withdrawn by *AFE* in 1954.

Pan American Trans-continental Railway locos

These locos were sent after their absorption into the *FTE* fleet to the Northern of Montevideo line as that also used knuckle couplers. However, in the 1920s all ex-PATCO locos and stock were rebuilt with European-style buffers and hook couplings for the sake of compatibility with the rest of the country.

0-4-2T or 0-4-0T d/w 36", cyls. 12x18", built by Lima in 1911

Ordered for the Pan American Trans-continental Railway. [1] says 0-4-2T and w/n 1075 but Connelly's Lima list says 0-4-0T and that running number was to be **1**.

19	w/n 1154	Use unknown but may have remained on Durazno to Trinidad line.

2-6-2T d/w 50", cyls 15x20", built by Lima in 1911

Ordered for the Pan American Trans-continental Railway

10	w/n 1155	Ex PATCO no. **2**, became *AFE* no. **210** in 1952.
11	w/n1156	Ex PATCO no. **3**, became *AFE* no. **211** in 1952.

At least one was used on the construction of the line from Treinte y Tres to Río Branco in the 1930s. Both withdrawn in August 1954. Probably scrapped in 1960s.

2-6-0 d/w 50", cyls. 15x24", built by Lima in 1911

Ordered for the Pan American Trans-continental Railway

20	w/n 1157	Ex PATCO no. **4**. Used on line to Saranda del Yi. Became *AFE* no. **220** in 1952. Worked at Río Branco latterly.
21	w/n 1158	Ex PATCO no. **5**. Used on line to Saranda del Yi. Became *AFE* no. **221** in 1952. Worked at Río Branco latterly.

Both withdrawn in August 1954. Probably scrapped in 1960s.

Caption says these locos seen deflection testing the bridge at ?? were ex PATCO nos. **4** and **5**.

Uruguay Railway locos

0-6-0T d/w 42", cyls. 12x18", built by Kerr Stuart in 1912

Ordered for Brazil Railway Company, La Paloma, Brazil, ie. this and the following pair of 0-6-0s were for the Uruguay Railway.

18 w/n 1196

0-6-0 d/w 40", cyls. 16x20", built by Baldwin in 1913

Ordered via the Brazil Railway Company for the Uruguay Railway Company. Class 08-26D nos. 194-195. Spec. is in vol. 44 p 76. Walshaerts valve motion. No mark on tender, nos. **1** and **2** on front number plate and on dome. Gresham & Craven automatic vacuum brake. Screw coupling and side spring buffers. Eight wheeled tender.

16 w/n 39689 Ex Uruguay Railway no. **1**. Became *AFE* no. **216** in 1952.

17 w/n 39690 Ex Uruguay Railway no. **2**. Became *AFE* no. **217** in 1952.

Both locos withdrawn in August 1954. **216** was in Durazno at the time, and **217** in Treinte y Tres.

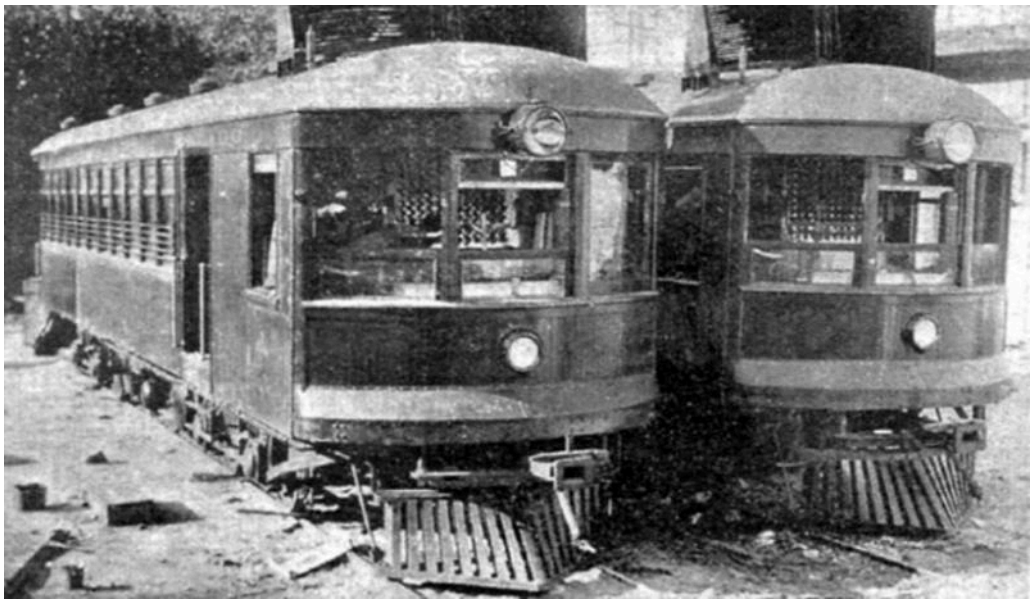
Later purchases

Steam electric railmotors built by Rushmore & Co. of Boston in 1921

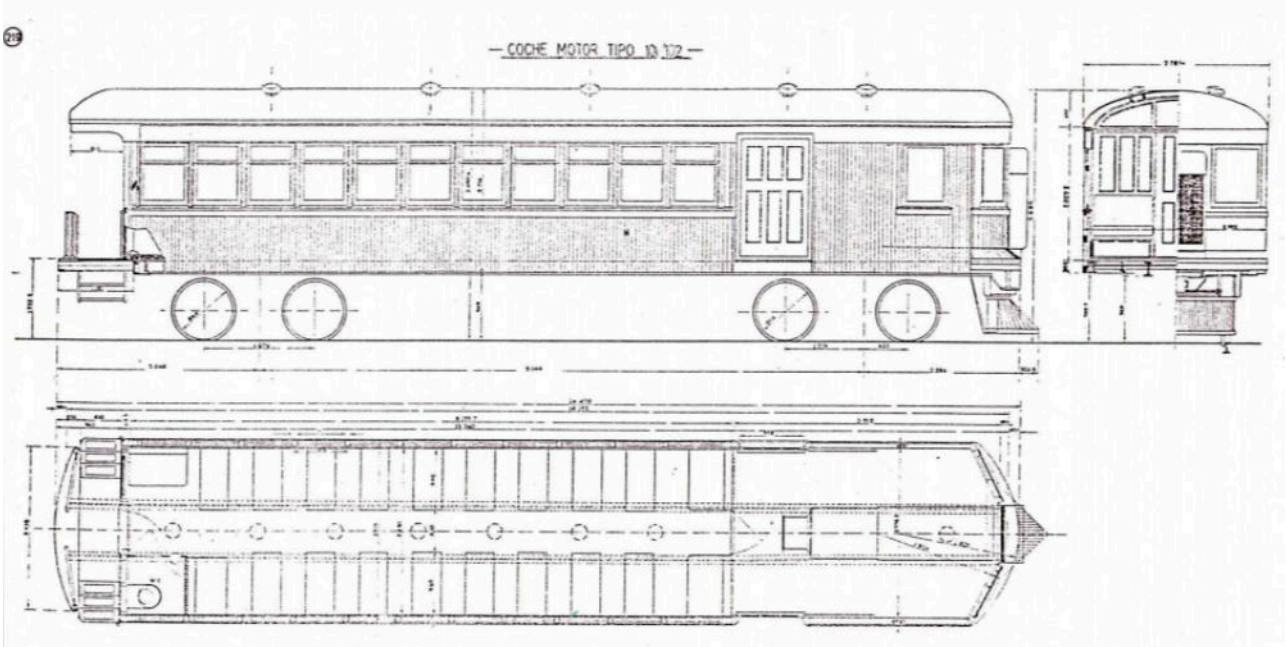
Trade name 'Unit Cars', purchased via G. E. Nolan, the maker's representative in Uruguay. Cost of each US$34,342. Operated only from May to October 1922. Found to be unsatisfactory and then withdrawn. Converted to petrol engines in 1929, using Leyland/English Electric equipment. Then used on Durazno to Trinidad branch.

? w/n ?

? w/n ?



Note the condensers / radiators mounted above the roofs at the near end of each car.



These drawings show the Rushmore railcars after their conversion to petrol-electric operation. However, the exterior changes are likely to have been relatively minor, such as the radiator placed in the centre of the front end, and the removal of the earlier roof-mounted condenser/ radiator.

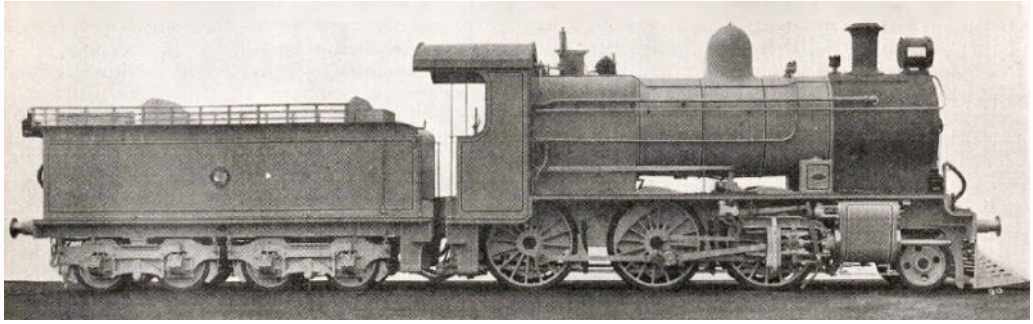
2-6-0 d/w 60", cyls. 18x24" built by Beyer Peacock in 1929

Ordered for Uruguayan State, at about the time that the *FTE* extended its tracks into Punta del Este with a consequent increase in tourist passenger traffic. Order no. 1519. Sr. Fabián Iglesias has expressed his puzzlement as to why these engines were purchased set up to burn coal when the CUR was already busy converting its fleet to oil burning. He also has drawn attention to identification features which make it easy to distinguish these six locos from the 2-6-0s of the CUR: including the full height cab handrail up to the roof, and the very large smokebox doors.

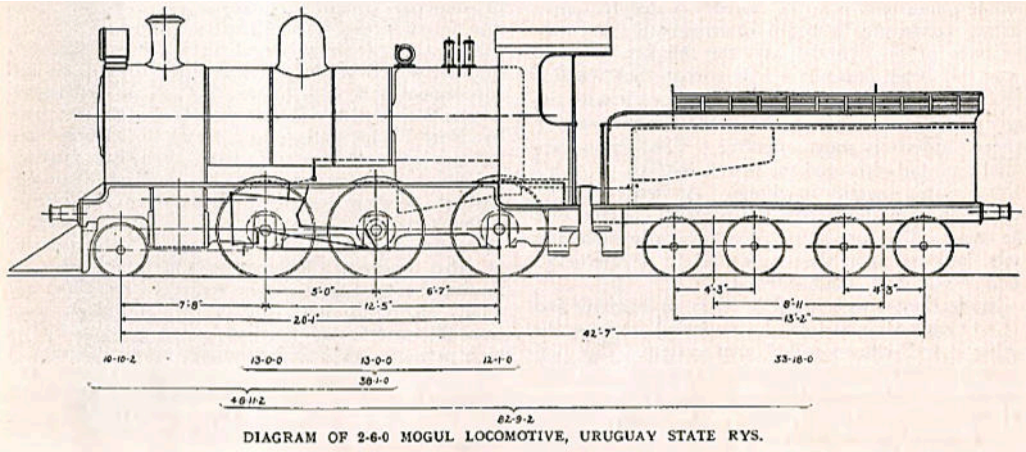
22	w/n 6547	Became *AFE* no **222** in 1952.
23	w/n 6548	Became *AFE* no **223** in 1952.
24	w/n 6549	Became *AFE* no **224** in 1952.
25	w/n 6599	Became *AFE* no **225** in 1952.
26	w/n 6600	Became *AFE* no **226** in 1952. Seen in service at Salto in 1969 [44].
27	w/n 6601	Became *AFE* no **227** in 1952.

These became known as *AFE* class Z after the 1952 merger.

No. **27** is seen in a Beyer, Peacock builder's photo.



Both the builders' photo above, and the outline drawing below,
are as published in *The Locomotive* issue of 15th February 1930.



2-6-0 d/w 54", cyls. 17½x24", built by Beyer Peacock in 1900

Ordered for CUR as class L no. **74**, sold to *FTE* in 1940.

18 w/n 4202 Source [40] comments: *siendo retirada del inventario el día 27 de agosto de 1954. Solo se expresaba que "Necesita reparación" Abandonada en Estación Canning.*

9.2.6 The nationalised *AFE*, formed in 1952

Background

Whilst the British-owned railways came into government ownership at the end of January 1949, they continued to operate separately from the *FTE* until September 1952 when a new over-arching *Administración de Ferrocarriles del Estado* took control of all the state-owned lines.

Locomotive numbering

Operational locomotives of the CUR, including those which had been incorporated from the Midland in 1938, retained their current numbers within the ranges **1** to **151** and **174** to **183**. *FTE* locos, on the other hand, had their numbers increased by 200. The following list does not attempt to duplicate the detail of the earlier lists, but summarises the fleet as inherited in 1952 and changes thereafter.

Note that this list is presented with rather less confidence than are many of the others in this file as, whilst the locos in service in 1940 are known with some accuracy from P. C. Dewhurst's lists in source [1], there is little information available about which of those were withdrawn during the subsequent decade.

Ex CUR locomotives

These locos retained their pre-nationalisation CUR numbers.

Class A-1

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

3	w/n 923	In service in 1952, but withdrawn possibly 1954, and formally removed from fleet list in 1956 [17]. However, it was not scrapped and was returned to service in the 1970s when there was a desperate shortage of power. Finally withdrawn in 1975. Most recently recorded plinthed at Piedra Alta.

Class B-1

2-6-0T d/w 40", cyls. 15x20", built by Beyer Peacock in 1889

4	w/n 3011	Still in service in November 1988. Plinthed? at Elias Regules theme park in Montevideo.

Class B-1

2-6-0T d/w 40", cyls. 15½x20", built by Beyer Peacock in 1905 and 1910

1	w/n 4744	
2	w/n 4745	
17	w/n 5394	Converted to burn wood for occasional use at Piedra Alta workshops. Survives, now at Bella Vista.

Class B-1

2-6-0T d/w 40", cyls. 15½x20", built by Hudswell Clarke in 1906

15	w/n 778	Still in service in November 1988. Was lying dismantled at Peñarol workshops in 1998.
16	w/n 779	

Classes W and H-1

2-8-2T and 2-8-2 d/w 47", cyls. 18x24", originally built by Beyer Peacock in 1884

23	Originally BP w/n 2513	Class W ex class H. Withdrawn 1963. Lay at Carnelli / Bella Vista for some years. Scrapped there in 1970s or 1980s.
22	Originally BP w/n 2512	Class H-1 ex class H. Withdrawn in 1964 and sold to Armor *frigorifico*, but then loaned back to *AFE* owing to a shortage of motive power and used until 1978.
24	Originally BP w/n 2514	Class H-1 ex class H. Withdrawn in 1956.

Class D

4-4-4T d/w 60", cyls. 16x24", built by Vulcan Foundry in 1913 and 1915

38	w/n 2830	Used as stationary boiler at Peñarol in 1969. Abandoned at Km 18 in 1987. Boiler still lay at Peñarol derelict in 2007.
39	w/n 2831	Served as fixed boiler at Bella Vista until 1984, having been converted into "*Equipos Móviles de Limpieza*". Scrapped at Km 18 in 1987.
40	w/n 2832	Sent to Durazno in 1950s to work the Trinidad branch [12]. Collided with truck in Durazno. Withdrawn May 1958.
41	w/n 2833	Withdrawn at end of 1963. Awaited scrapping at Bella Vista in 1979.
42	w/n 2834	Sent to Durazno in 1950s to work the Trinidad branch [12]. Withdrawn August 1954.
43	w/n 2835	Latterly was "*Equipos Móviles de Limpieza*". In 1987 lay abandoned at Km 18.
8	w/n 3135	Sent to Durazno in 1950s to work the Trinidad branch [12]. Withdrawn August 1954. Lay there in 1958.
9	w/n 3136	Withdrawn at end of 1963. Awaited scrapping at Peñarol or Bella Vista in 1979.

Class A

0-6-0T d/w 42", cyls. 13x17", built by Manning Wardle in 1888

42A	w/n 1045	Loco survives, at the Sudriers workshops, and later moved to Peñarol diesel workshops.

Class L

2-6-0 d/w 54", cyls. 17½x24", built by Beyer Peacock in 1895-1900

63	w/n 3627	
64	w/n 3628	
65	w/n 3634	
66	w/n 3635	
67	w/n 3636	
68	w/n 3861	Withdrawn August 1954.
69	w/n 3862	
70	w/n 3863	
72	w/n 3865	
73	w/n 4201	
74	w/n 4202	Sold to *FTE* 1940 [1].
75	w/n 4203	
76	w/n 4204	

77	w/n 4205	
78	w/n 4206	

Class N, with nos. 115-122 as class N-1

2-6-0 d/w 60", cyls. 18x24", built by Beyer Peacock in 1906-1910

88	w/n 4746	Still in service in November 1988. Survives at Paysandú but to be moved to Montevideo?
89	w/n 4747	
90	w/n 4748	
91	w/n 4749	
92	w/n 4750	Still in service 1980s. Plinthed in park at San José.
93	w/n 4751	Still in service 1980s. Now plinthed at Young.
94	w/n 4941	
95	w/n 4942	
96	w/n 4943	Still in service 1980s. Plinthed in square at Artigas.
97	w/n 4944	
98	w/n 4945	
99	w/n 4946	
100	w/n 4947	
101	w/n 4948	Survives at Peñarol 2006.
102	w/n 4949	
103	w/n 4950	
104	w/n 4951	
105	w/n 4952	Scrapped 1992.
106	w/n 4953	
107	w/n 4954	
108	w/n 4955	
115	w/n 5395	Class N-3. Seemingly withdrawn in early 1960s [20].
116	w/n 5396	Class N-3. Seemingly withdrawn in early 1960s [20].
117	w/n 5397	Class N-. Worked as stationary boiler at Paysandú until 1993. Loco still survives at Paysandú, though dismantled.
118	w/n 5398	Class N-2. Seemingly withdrawn in early 1960s [20].
119	w/n 5399	Class N-3. Given heavy repair in 1979 including fitting the cylinders that had been on class Z no. 224. Still in service in November 1988, and described as in class N-3 at that time. Used as stationary boiler at Bella Vista in early1980s but then returned to work on coastal lines between Salto and Paysandú. Repaired at Paysandú in 1984 for use on special trains. Has run for some time carrying no. **120** plates as own plates had been sold. Declared a National Historic Monument in 1999. Currently running with tender from no. **122**. Major overhaul 2002-2005 and then regained original number **119**.
120	w/n 5400	Class N-3. In use on PW trains in early 1980s. Still in service at Paysandú in November 1988. Moved to Paso de los Toros in 1998 for display, and 2005 to Montevideo for restoration.
121	w/n 5401	Class N-2. Seemingly withdrawn in early 1960s [20].

122	w/n 5402	Class N-3. Still in use on PW trains in early 1980s, then used as stationary boiler at Bella Vista. Scrapped at Peñarol in 1996.

Class R, with nos. 112-113 built as class R-1, and nos. 123-131 as R-2

2-8-0 d/w 54", cyls. 19x24", built by Beyer Peacock in 1907- 1914

109	w/n 4956	Class R-4. OoS in Paysandú 1968, withdrawn formally in April 1969.
110	w/n 4957	Class R-4. OoS in Paysandú 1968, withdrawn formally in April 1969
111	w/n 4958	Class R-4. Withdrawn formally at end of 1963.
112	w/n 5403	Collided with a bus on a level crossing in Young, 21st May 1956. Out of use by 1968 in Paysandú, and formally with drawn April 1969. But possibly active in 1972. Believed scrapped between 1977 and 1979.
113	w/n 5404	OoS in Bella Vista 1969, Without boiler in 1974. withdrawn formally in 1975.
114	w/n 5405	Used as stationary pump in Bella Vista / Carnelli 1967, withdrawn formally in 1974.
123	w/n 5414	OoS in Paysandú 1968, withdrawn formally in April 1969. Sold for scrap 1979.
124	w/n 5415	OoS in Bella Vista 1971, withdrawn formally at end of 1963.
125	w/n 5416	Rebuilt superheated in 1916 [11]. In fleet at end of 1941 [1]. Active in Paysandú 1968 and active 1973, withdrawn formally in 1974.
126	w/n 5763	Withdrawn formally April 1969, but active 1971 and still existed at Peñarol in 1981. Probably scrapped 1986-7.
127	w/n 5764	OoS in Paysandú 1968, withdrawn formally in April 1969.
128	w/n 5765	OoS in Bella Vista 1969, withdrawn formally in 1977, but may have been sold for scrap 1975.
129	w/n 5766	Active at Rivera 1972, withdrawn formally in 1978.
130	w/n 5767	Class R-2. Withdrawn at end of 1963 and lay at Paysandú. Later returned to service. Scrapped in 1979 [9].

Class T

2-8-0 d/w 60", cyls. 20x26", rebuilt from class F 2-6-0s at Peñarol works in 1937-40

132	Originally BP w/n 5769	
133	Originally BP w/n 5770	
134	Originally BP w/n 5771	
135	Originally BP w/n 5772	
136	Originally BP w/n 5773	
137	Originally BP w/n 5774	
138	Originally BP w/n 6093	
139	Originally BP w/n 6094	
140	Originally BP w/n 6095	Large boiler fitted June 1940 and therefore became class T-1.
141	Originally BP w/n 6096	Large boiler and therefore class T-1.

Class S

2-8-0 d/w 60", cyls. (3) 17½x26", built by Hawthorn Leslie in 1921

142	w/n 3447	Still working in 1972, but withdrawn certainly by Jan 1975. Probably scrapped at end of 1970s.
143	w/n 3448	Withdrawn at end of 1963. Scrapped at Carnelli / Bella Vista around 1970.
144	w/n 3449	Rebuilt 1976. Withdrawn 1979. Ended up in outdoor museum for several years then taken to Carnelli station, and eventually allocated to CEFU. Later it was returned to the *AFE* but was left to rot. Was at Peñarol roundhouse in 2005.
145	w/n 3450	Scrapped at Carnelli / Bella Vista around 1970.
146	w/n 3451	Withdrawn in 1965. Scrapped at Carnelli / Bella Vista around 1970.
147	w/n 3452	Withdrawn in 1965.

Class S

2-8-0 d/w 60", cyls. 19½x26", built by Beyer Peacock in 1929

Ex 3-cylinder machines.

148	w/n 6574	Withdrawn at end of 1963. Scrapped at Carnelli / Bella Vista around 1970.
149	w/n 6575	Withdrawn at end of 1963. Scrapped at Carnelli / Bella Vista around 1970.
150	w/n 6576	
151	w/n 6577	Scrapped at Carnelli / Bella Vista

Class V

2-10-0 d/w ?, cyls. ?, built by Henschel in 1950

1969 all concentrated at Carnelli and with **156** being cannibalised to keep others running.

156	w/n 25052	Side-lined by 1971. Scrapped at Carnelli in 1979.
157	w/n 25053	Side-lined by 1971. Scrapped at Carnelli in 1979.
158	w/n 25054	Last one in service, until 1977. Steamed one last time in 1979. Survives at Peñarol 2005.
159	w/n 25055	Worked into 1970s. Scrapped at Carnelli in 1979.
160	w/n 25056	OoS by 1971. Scrapped at Carnelli in 1979.

<u>Ex Midland locomotives</u>

These engines had been re-numbered at the merger with the CUR in 1938, rather than at the formation of the *AFE* in 1952.

Class X, ex Midland class F

2-6-0 d/w 54", cyls. 16½x24", built by Hudswell Clarke in 1906

174	w/n 741	Ex Midland. no. **13**.
175	w/n 742	Ex Midland. no. **14**.

2-6-0 d/w 54", cyls. 17x24", built by Beyer Peacock 1908-1912

176	w/n 5152	Ex Midland. no. **15**.
177	w/n 5153	Ex Midland. no. **16**.
178	w/n 5325	Ex Midland. no. **17**.

179	w/n 5326	Ex Midland. no. **18**.
180	w/n 5383	Ex Midland. no. **19**.
181	w/n 5406	Ex Midland. no. **20**.
182	w/n 5533	Ex Midland. no. **21**.
183	w/n 5534	Ex Midland. no. **22**.

Ex *FTE* locomotives

Class Y-1

4-4-0 d/w 61½", cyls. ?, built by Hawthorn Leslie in 1895

Ex *FC Norte de Montevideo.*

201	w/n 2320	Ex no. **1 'OLMOS'.** Moved in 1940s to the Durazno Trinidad line [8]. Survived on La Tablada branch until end of 1950s.
202	w/n 2321	Ex no. **2 'MOSQUITOS'**. Moved in 1940s to Florida - P. Alta [8].

Class B-2

2-6-0T d/w 40", cyls. 15½x20", built by Beyer Peacock in 1903 and 1905

203?	w/n 4734	Ex no. **3 'MONTEVIDEO'**. Withdrawn by *AFE* in 1961.
212?	w/n 4560	Ex no. **12 'ABASTO'.** Withdrawn by *AFE* in 1961.

Class Y

2-6-2T d/w 45", cyls. 15x22", built by Hawthorn Leslie in 1908

205	w/n 2759	Ex no. **5 'PAN de AZUCAR'**

2-6-2T d/w 40", cyls. 16½x20", built by Beyer Peacock in 1909

215?	w/n 5324	Ex no. **15 'PROGRESO'**? Withdrawn by *AFE* in 1954.

2-6-2T d/w 50", cyls 15x20", built by Lima in 1911

Ex Pan American Trans-continental Railway

210	w/n 1155	Ex PATCO no. **2**, then *FTE* no. **10**.
211	w/n1156	Ex PATCO no. **3**, then *FTE* no. **11**.

At least one was used on the construction of the line from Treinte y Tres to Río Branco in the 1930s. Both withdrawn in August 1954. Probably scrapped in 1960s.

0-6-0 d/w 40", cyls. 16x20", built by Baldwin in 1913

Ex Uruguay Railway Company.

216	w/n 39689	Ex Uruguay Railway no. **1**, then *FTE* no. **16**.
217	w/n 39690	Ex Uruguay Railway no. **2**, then *FTE* no. **17**.

Both locos withdrawn in August 1954. **216** was in Durazno at the time, and **217** in Treinte y Tres.

2-6-0 d/w 50", cyls. 15x24", built by Lima in 1911

Ex Pan American Trans-continental Railway

220	w/n 1157	Ex PATCO no. **4**, then *FTE* no. **20**. Used on line to Saranda del Yi. Worked at Río Branco latterly.
221	w/n 1158	Ex PATCO no. **5**, then *FTE* no. **21**. Used on line to Saranda del Yi. Worked at Río Branco latterly.

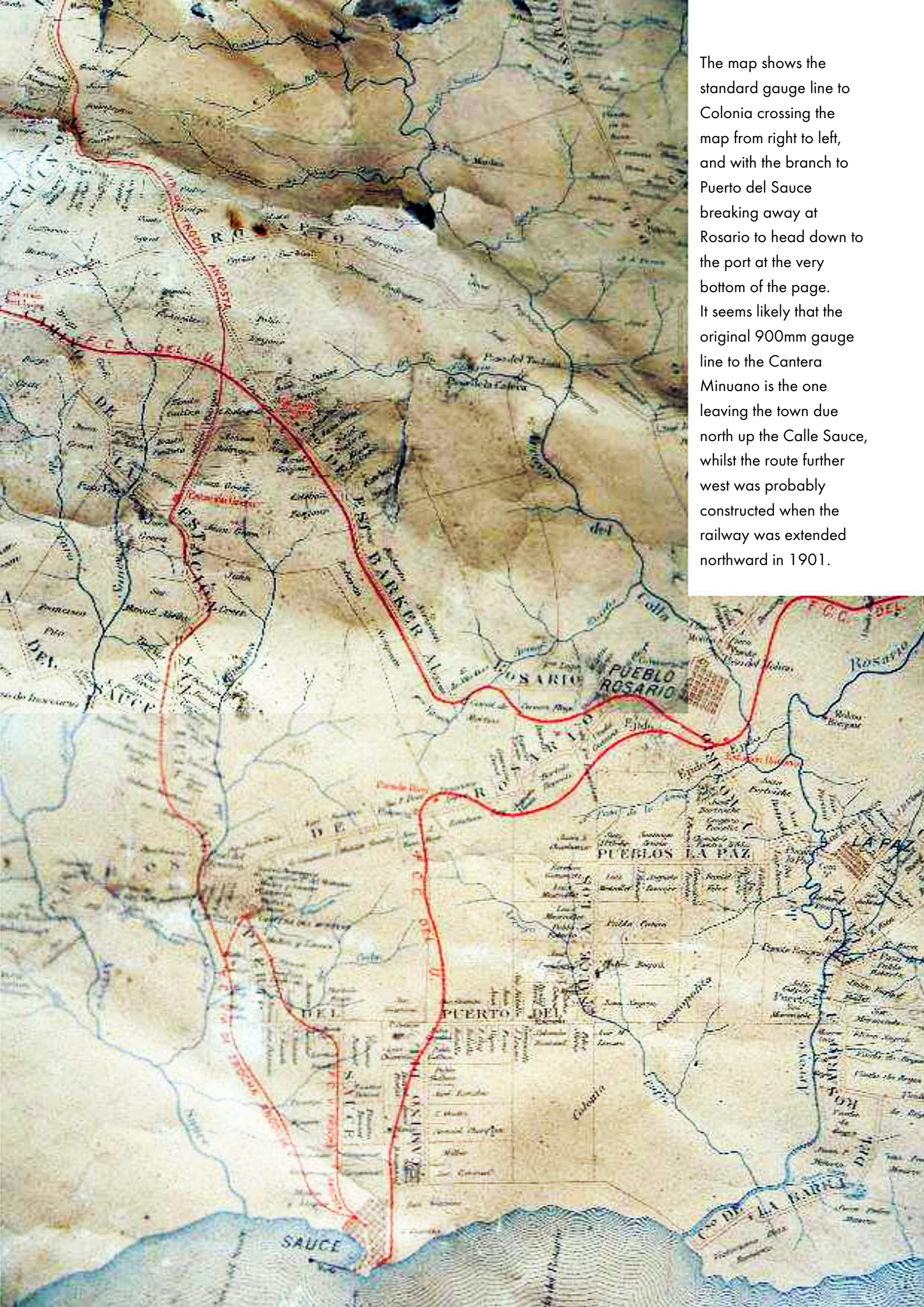
Both withdrawn in August 1954. Probably scrapped in 1960s.

Class Z

2-6-0 d/w 60", cyls. 18x24" built by Beyer Peacock in 1929

Info largely from source [31].

222	w/n 6547	Ex *FTE* no. **22**. Latterly working between Paysandú and Salto. Withdrawn 1979.
223	w/n 6548	Ex *FTE* no. **23**. First to be withdrawn, April 1969.
224	w/n 6549	Ex *FTE* no. **24**. Latterly in use on materials trains for Salto Grande link. Withdrawn 1979 after a firebox oil explosion. Cylinders saved for loco. no. **119**.
225	w/n 6599	Ex *FTE* no. **25**. Latterly working between Paysandú and Salto. In service until 1981.
226	w/n 6600	Ex *FTE* no. **26**. Dismantled in 1977 or maybe 1979.
227	w/n 6601	Ex *FTE* no. **27**. Worked as stationary boiler at Bella Vista until 1975. Scrapped there in 1979.



The map shows the standard gauge line to Colonia crossing the map from right to left, and with the branch to Puerto del Sauce breaking away at Rosario to head down to the port at the very bottom of the page. It seems likely that the original 900mm gauge line to the Cantera Minuano is the one leaving the town due north up the Calle Sauce, whilst the route further west was probably constructed when the railway was extended northward in 1901.

9.3 90 cm gauge public railways

9.3.1 *Puerto del Sauce a Terminal*

Background

The original standard gauge railway running inland from Puerto del Sauce had been built by Sres. Medici y Lacaze through the instrument of the Uruguay Western Railway & Port Ltd. The line had reached Mal Abrigo and then San-José, but being out of cash was then sold to the Central Uruguay Railway, who set up the CUR Western Extension Railway Co. to manage it. See section 9.1.6.

Medici and Lacaze held on to the port at Puerto del Sauce and continued running a 90cm gauge system to the local Cantera Minuano. Lavalle y Medici had originally built the Puerto del Sauce at a point on the coast which had something of a natural harbour. They supposedly brought over six small Cockerill locos that they had used during the building of the port of La Plata. They were 900mm gauge (not 3' 0" gauge as Fabián Iglesias states in his various papers) and ran between the port and a local quarry. However, there are no such 900mm gauge locos in the Cockerill list. There are however six metre gauge vertical-boilered tank locos (1491-6) built in 1886 for the agents Mes Portales et Cie. in Paris for Argentina, but the photo below suggests that these were not the locos which arrived in Uruguay. What *M y L* did definitely have were four 900mm gauge Ruston Proctors. One of those is supposed to have come to Uruguay. They also purchased later six O&Ks.

See source [39] for much further information about this railway. This is a PDF file entitled *Ferrocarril de Puerto del Sauce a Puntas del San Juan*, collated by Fabian Iglesias and available from the Facebook page named *Ferrocarriles Uruguayos (A.T.U.)*.

This line may well have changed its gauge during its early history. There are references to the use of metre gauge prior to a change to 900mm.

<u>Metre gauge locos</u>

0-6-0ST d/w 42", cyls. 12x20", built by Black Hawthorn in 1888

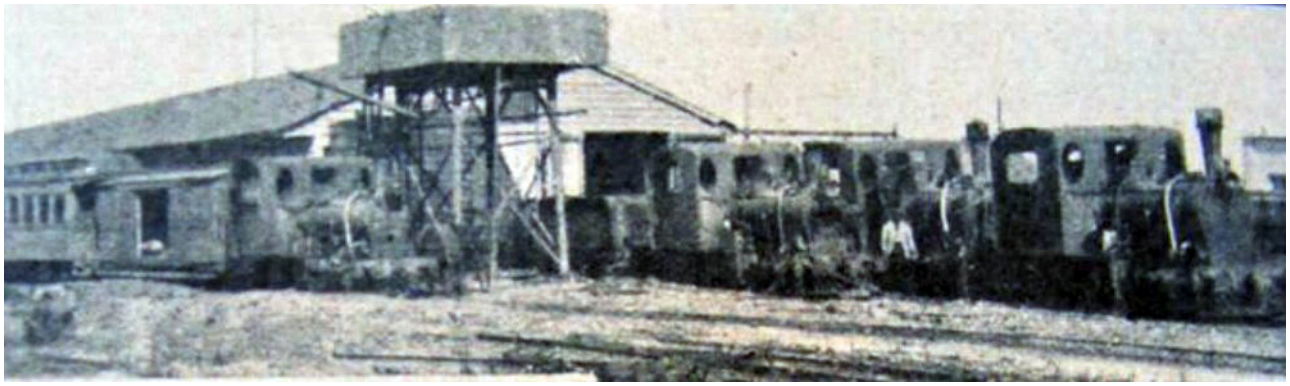
Ordered for James Perry & Co. for the construction contract on the Northern Railway.

?	w/n 959	Eventually sold to Argentina for the *FC Central Cordoba* as their no. **20**, later **1006**, then **22**.

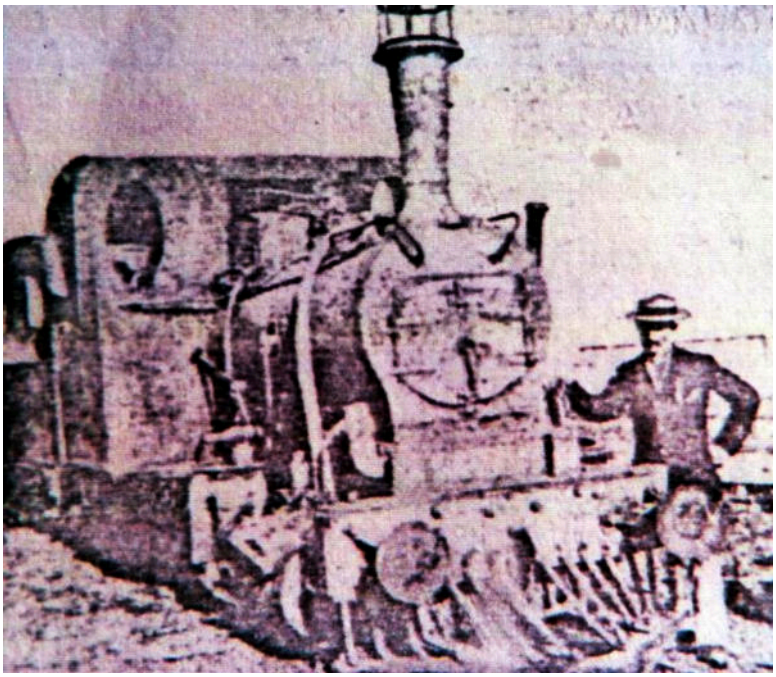
?? d/w ?, cyls. ?, built by Cockerill in ??

Ordered for ?	Arrived here in 1886 [39].
1	w/n ?
2	w/n ?
3	w/n ?
4	w/n ?
5	w/n ?
6	w/n ?

All in existence in 1902 but not in 1933 [39].



Certainly these locos appear to be of a standard design but not by O&K who supplied later locos at this location. Tubize used fore-and-aft wrap-over cab roofs such as seen here; they also sometimes built locos for Cockerill as sub-contractors.



A photo published in the *FC Central Argentino* magazine in 1915, as reproduced in [39].

The fleet in 1896

Source [39] records that an inventory for Juan Medici y Cía., made when a government contract was being signed in May 1896, includes seven locomotives, 150 wagons, and the fourteen km. of track between the port and the Canteras del Minuano.

0-6-0T d/w ?, cyls. ?, built by Haine St. Pierre in 1901

Ordered for 'Montevideo' and very possibly for here.

? w/n 730

? w/n 731

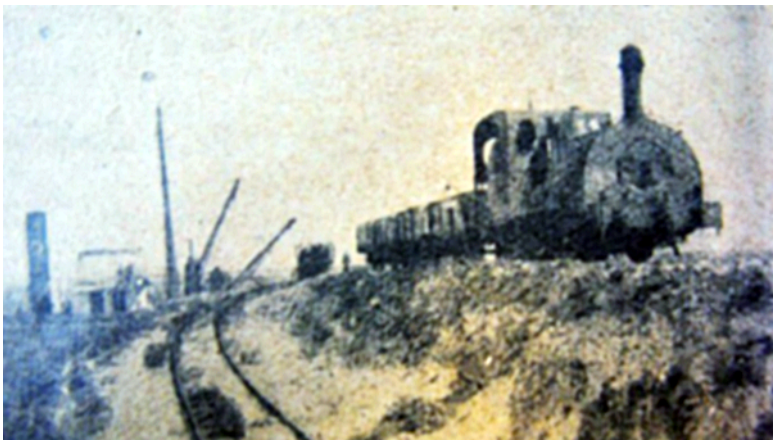
Fabian Iglesias in source [39] speculates tthat these engines may well have moved on elsewhere fairly rapidly as they do not appear in any inventories and appear to have disappeared by the time that the first O&Ks took the numbers **10** to **12** in 1912. Source [39] references a suggestion that at least one of them went to the La Esperanza sugar mill in Argentina, but it is not known what evidence there is for this.

<u>900mm gauge locos</u>

0-4-0ST d/w ?, cyls. 9½x16", built by Ruston Proctor in 1886

This will have been one of the four locos of this type used by Medici y Lavalle at La Plata. Driving wheels probably 33". Source [39] says arrived here in 1894, but had gone by 1933. An article on Ruston Proctor 5' 6" gauge locos in the *Industrial Railway Record* issue 232 (March 2018) mentions in passing that these four 90 cm gauge locos for Medici y Lavalle had been ordered via Back & Manson on 11th December 1885.

7 from w/n 11793-6



The saddle tank reaching down to the running plate and located at the smokebox end of the loco is definitely a Ruston Proctor feature. However, the cab looks as thoughit has been borrowed from one of the Cockerill locos above.

Renewed ambitions

When the Uruguay Western Railway and Port Co. was sold to the CUR in 1899, the agreement specified that Medici y Lacaze could not compete by means of another standard gauge railway, but nothing was said about narrow gauge. In 1901-2, therefore, they began to build a new narrow gauge railway north, to the gauge of their existing port railway system [26]. The aim was to head north toward Trinidad, but in the event just 41 km. was built, to Estacion Terminal, where the intention was that the route would divide with extensions onward to Trinidad and to Omboés de Lavalle. It operated from 1903 to 1959 according to Wikipedia at https://en.wikipedia.org/wiki/Rail_transport_in_Uruguay A search of Google Earth reveals possible sections of trackbed heading north-north-west but no likely terminus has yet been spotted. Other sources suggest that the terminus was at Las Puntas de San Juan near Cardona but that would imply a much greater route length than 41 km.

2-6-0 d/w ?, cyls. 12x16", built by Porter in November 1901

These are almost certainly the locos that came here. They were built to a gauge of 2' 11½" (901.3mm) and were ordered through S. H. Payne & Son via New York.

8	w/n 2428	In fleet in 1933 [39].
9	w/n 2429	Scrapped 1967? [39].

Source [39] speculates as to why it should have been no. **8** that was in service in 1933 whilst no. **9** was the one recorded as surviving in 1967. However, it was common for locos out of use or under repair to be missed out of fleet lists, so maybe no. **9** had been omitted in this way from the 1933 list.

Porter no. **9** lies derelict in 1967. Photo by Sr. Werther Halarewics of Montevideo, published in source [39].

0-4-0T d/w 800mm, cyls. 310x400mm, built by O&K in 1912

Ordered for Juan B. Medici, Argentina**.** Note that they seem to have been ordered for use in Argentina, and that not all may have made the move to Uruguay. Ernesto Romero, who posted the third photo below, suggests that only four may have arrived at Puerto del Sauce. Source [39] on the other hand lists all six as at Puerto del Sauce.

10	w/n 4819	140hp	Out of service 1967 [39].
11	w/n 4820	140hp	In service 1967 [39].
12	w/n 5034	140hp	Out of service 1967 [39].

This photo shows one of the 140hp O&Ks right at the end of its life, during the dismantling of the railway around 1967. This is another of Sr. Halarewics' photos from source [39]

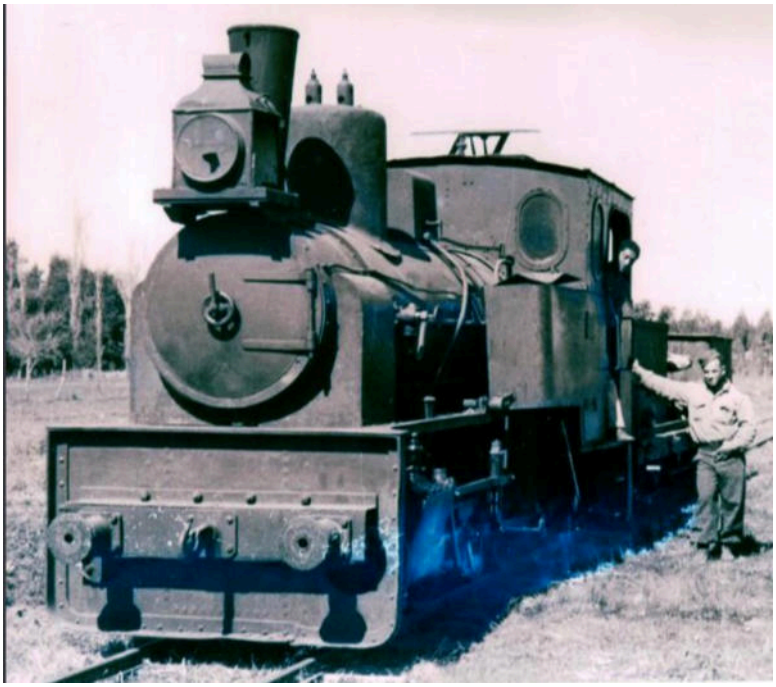


Photo of no. **11** whilst working on the tracklifting trains in 1967.
Taken by Sr. Ovidio Detjen, and found in source [39].

Another image by Werther Halarewics from 1967. Though these may well be 140hp locos, note the minor difference from the previous photo of no. **11**, in that the smokebox-side fairings on both locos slope inward whereas no. **11** has vertical sides to the sheet metal work.

0-4-0T d/w 700mm, cyls. 240x350mm, built by O&K in 1913

13	w/n 5218	70hp
14	w/n 5219	70hp

A side view of one of the 70hp O&K engines bearing the number **14**. Note that these locos do not have a cab side window. Interestingly they seem to have outside Allan straight link motion. Posted by Ernesto Romero on the *Ferrocarriles Uruguayos (ATU)* Facebook page.

0-4-0T d/w ?mm, cyls. 260x400mm, built by O&K in 1913

15 w/n 6245 90hp

Changes of ownership

In 1915 the widow of Sr. Medici sold the railway to another sand entrepreneur, Sr. Felix Fressone. However, in 1933 he went bankrupt and the line passed to the *FTE* to operate. [26 and 39]
The inventory on the takeover by the state in late 1933 included locomotives:
"Locomotoras: **8** (americana), **10, 11, 12, 13, 14** y **15** (tipo alemán)"

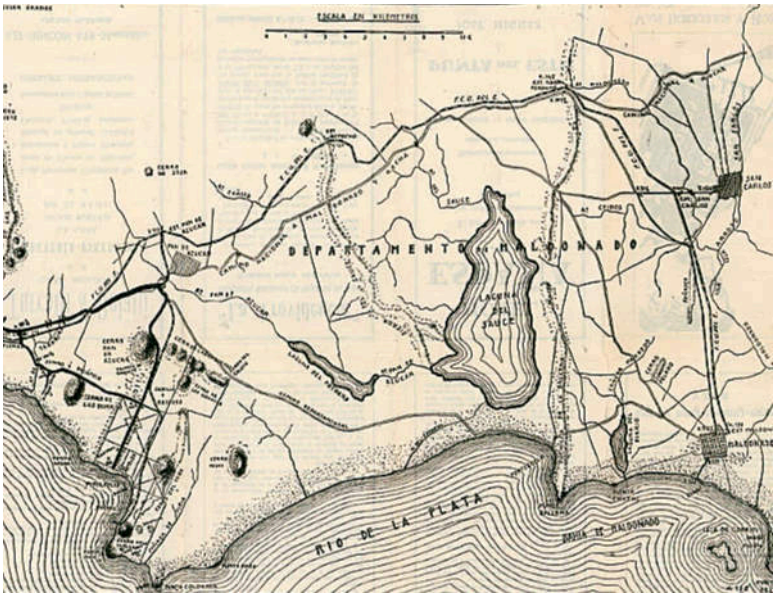
The fleet in 1958

In March 1958 when the *AFE* took an inventory of the equipment, they listed the following: locomotives **9, 10, 11** and **12** [39].

Reports differ as to the date of closure, possibly 1959. The rails and equipment seem to have gone for scrap in 1967.

9.4 75 cm gauge public railways

9.4.1 *Piriápolis a Pan de Azucar*



An extract of a map showing

Background

“75cm gauge. Piriápolis was conceived and founded as a new port by Don Fransisco Piria in 1890. The Piriápolis Railway was also built by Don Francisco, to run between the Port and the Pan de Azúcar hill, about 10 km away to the north. This was authorized by a law of December 21, 1907, in order to transport stone from the Pan de Azúcar quarry to the port of Piriápolis and for the transport of the many tourists who came in summer to the beach, since the Piriápolis Hotel, which had been opened in 1905, already offered accommodation. Subsequently, by a law of July 21, 1913, the extension of the line was authorized to take it into the Pan de Azúcar station of the then Uruguayan Eastern Railway, with a total route of 14 km. This facilitated the transportation of passengers from Montevideo to the spa town. The line was completed in its entirety in 1914. Branches left the Piriápolis Station towards the Port, the Piriápolis Hotel and towards the locomotive and workshop shed. The rolling stock consisted of six locomotives, twelve open and two closed winter lounges, and a large number of hopper and covered cargo wagons. All the material was of German origin.

We can place "the golden age" of the Piria train between the birth of the Hotel Argentino (1930) and the end of the Second World War (1945).

In 1946 the Piriápolis Railroad became administered by the FTE; and as of September 1952 by the newly created State Railways Administration (AFE). From that moment on, the Piriápolis Railway became a small branch of the extensive national railway network, being known as the Pan de Azúcar-Piriápolis branch. By this time there was a reduction in frequencies. Wagons and locomotives in service for four decades under hard conditions had maintenance problems and breakages were frequent, due to excessive wear. The supply of coal and wood for the machines was poor and it was not surprising that there were long stoppages due to lack of fuel, which now only served the purposes of local tourism. By the 1950s road motor transport captured the entire flow of tourists to Piriápolis. In October 1958 the AFE decreed the suppression of the branch, already provided for by the Organic Law of September 19, 1952.

The first sections of track began to be progressively lifted from 1966, but very slowly. Proof of this is that the tracks on Piria Avenue were only removed in 1984, and the locomotive shed - an excellent stone construction in front of the port - was demolished in 1995. Locomotives and passenger cars were deposited in the vicinity of the current Fauna and Flora Reserve, and remained abandoned there until 1966, when they were scrapped and for which they were transferred to the AFE workshops in Peñarol. However in 1969 it was still possible to observe some freight cars that

miraculously survived intact.
The embankments have remained, preserved along a good part of the route; as well as some culverts. At Pan de Azúcar Station you can see the pit where the turntable once was." [2]
NB A 60 cm gauge rail system was used during the construction of this railway, with at least one small German-built steam loco.
For further detailed information on this railway, see source [10].

0-6-0T d/w 580mm, cyls. 185x300mm, built by O&K in 1908 and 1911

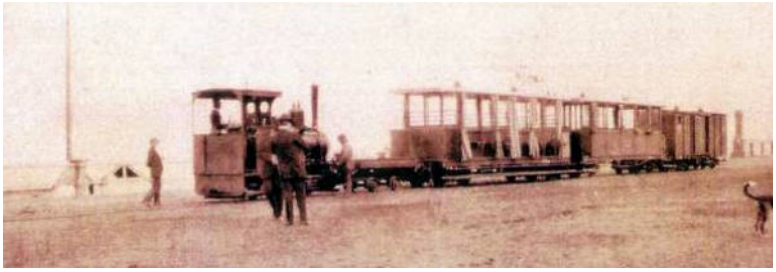
40hp. O&K list states for South America, export via Telge & Schröter of Hamburg, and to "ident Ernesto Quinke" of Uruguay, respectively.

5	w/n 2818	40hp
6	w/n 2819	40hp
4	w/n 4741	40hp

0-4-0T d/w 550mm, cyls. 145x260mm, built by O&K in 1910

20hp. Ordered via Ernesto Quincke of Uruguay.

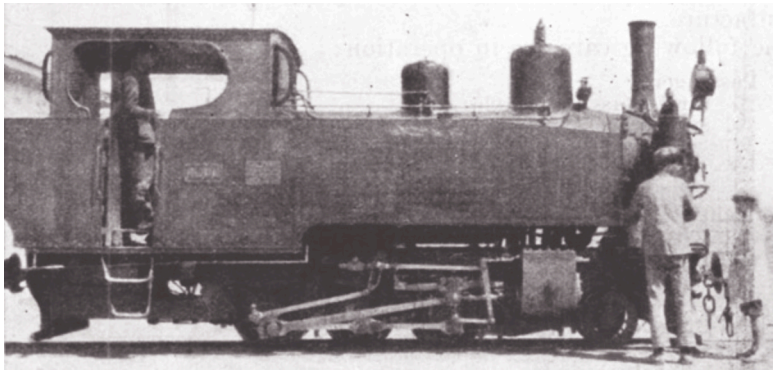
3	w/n 3725

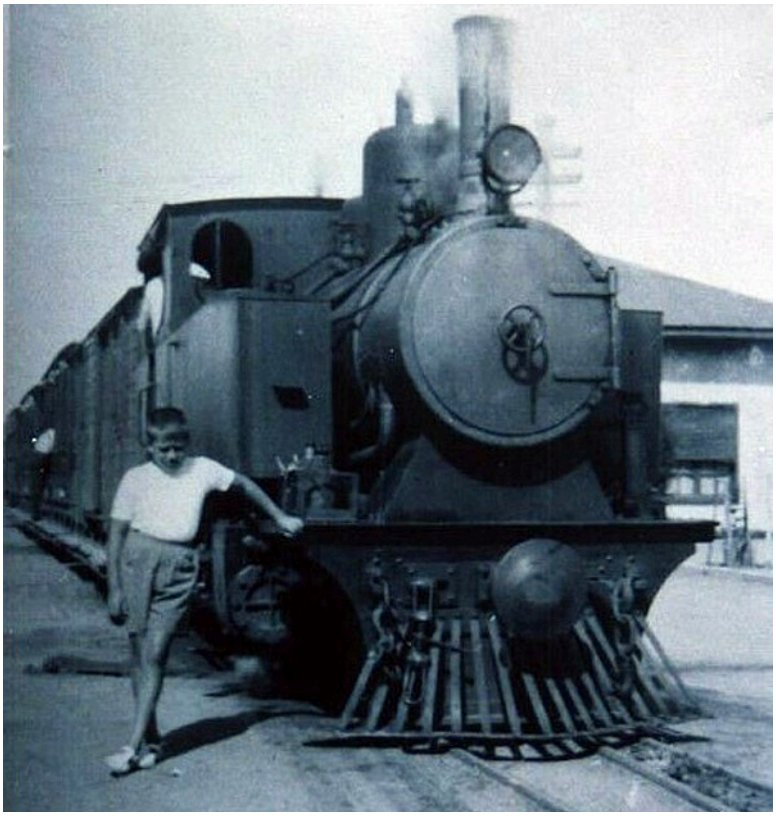


2-6-0T d/w 800mm, cyls. 300x350mm, built by O&K in 1913

125hp. Ordered via Ernesto Quincke for Piria, Montevideo, Uruguay.

1 'FUERZA'	w/n 6698
2 'VOLUNTAD'	w/n 6699





9.5 60 cm or narrower gauge public railways

9.5.1 The pier railway at Real de San Carlos in Colonia de Sacramento

Background

This railway formed part of the Mihanovich shipping empire. As an adjunct to the Argentina-Uruguay cross-river trade, an 8000-seat bull-ring and casino hotel was built in Colonia to attract gamblers from Buenos Aires. The casino was about 750m from the beach where a *muelle* was built for passenger steamers with a railway to take guests to the casino. Day tickets were offered for the casino, which included steamer and train tickets. However, bull-fighting was banned in Uruguay in 1912 [13]. With the prohibition of gambling in Argentina about 1917, which incidentally also did for the Sierra de la Ventana Club Hotel of the *FC Sud* and its associated narrow gauge branch line, the intense steamer traffic ceased and the railway closed.

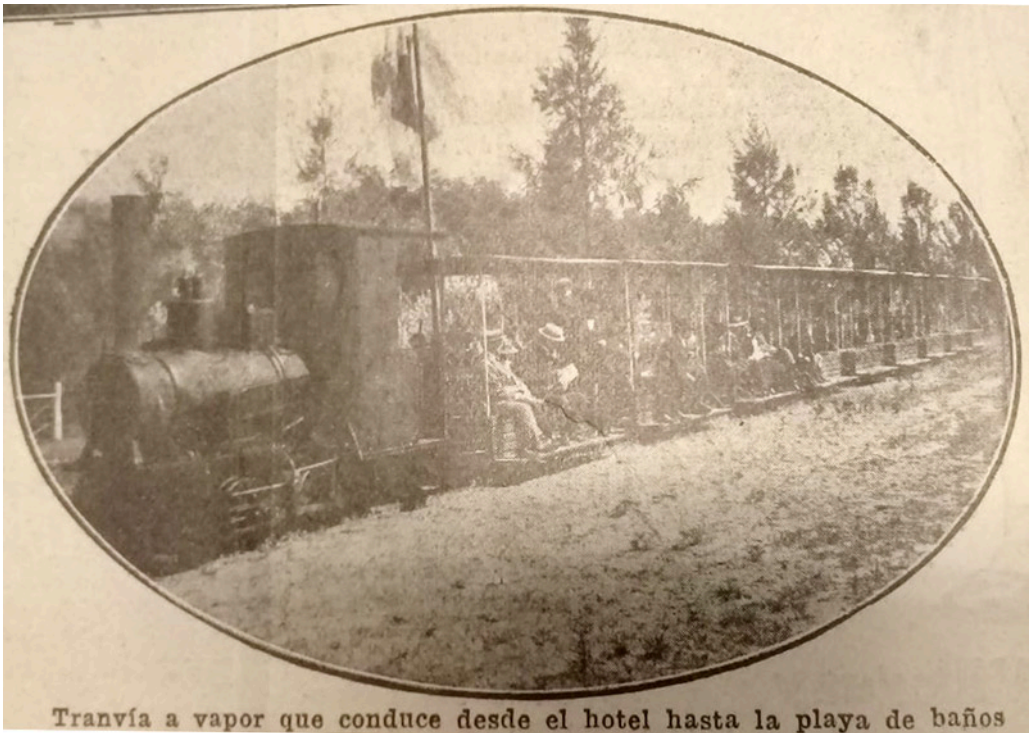
The line had been laid around 1908 to help facilitate construction in the area and first carried passengers in 1910. The total length would have been about 750m, and the gauge was almost certainly 60 cm. There seem to have been at least five locos, as one has the number **5** on its chimney. Several were 20hp O&Ks whilst there was at least one Henschel. There may well have been an extension or branch to a local sand quarry.

The whole complex passed to the government in 1943 and was then left abandoned. The tracks were apparently still there in 1958 but in a state of dereliction, though there were still skips around, suggesting that the railway had continued to serve some purpose maybe from a quarry.

0-4-0T d/w ?, cyls. ?, built by O&K in ?

? w/n ?

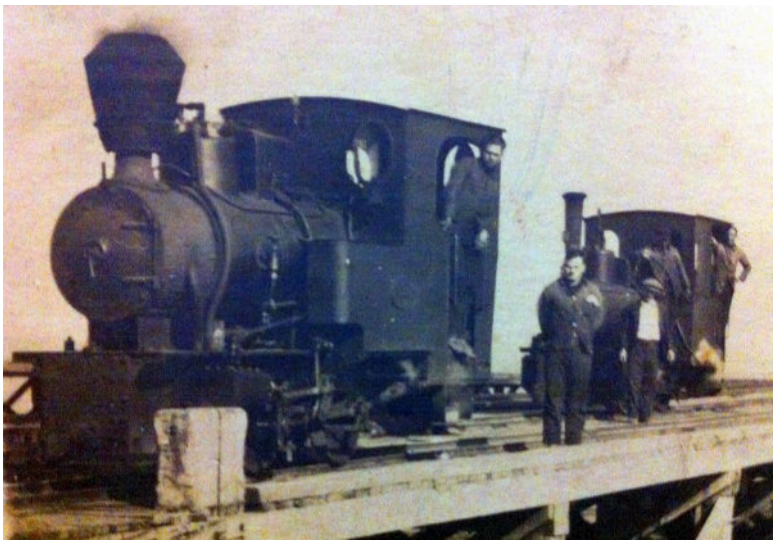
It seems likely that there were several locomotives, not merely from O&K but probably also from Henschel. However, at present there is no firm information.



All three pictures here seem to show the same type of O&K 0-4-0WT, probably of 20hp.

In the background is the distinctive pier end shelter with a curved roof that sheltered those waiting for the connecting steamers.

Another view of a passenger train with the pier end shelter in the background. However, whilst the loco may again be an O&K, it does not seem to be the same one, for it has a stovepipe chimney and other minor differences such as a seemingly slightly wider cab. The reason for the flags being mounted on the smokebox is unknown.

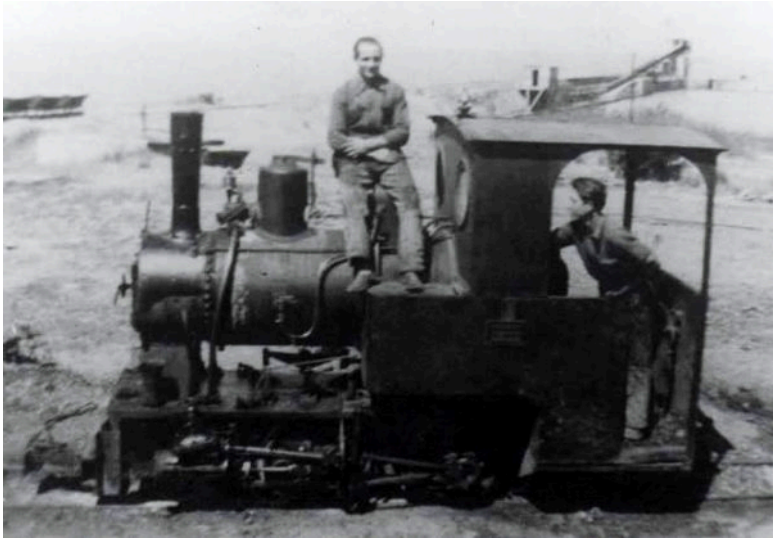


The right hand loco is an O&K whilst the left hand one is probably a Henschel.

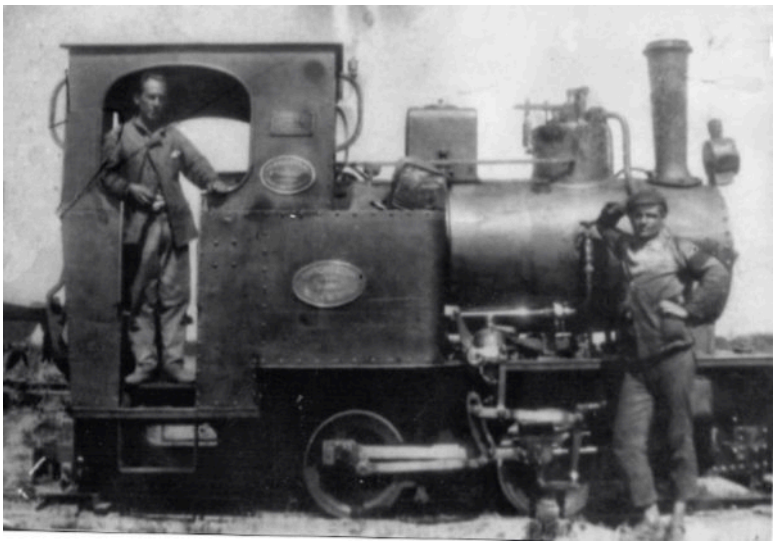
Further photos possibly at this location

Further pictures of 60cm gauge sandpit locos have also been identified by Uruguayan enthusiasts as being at Real de San Carlos. However, this has not yet been confirmed, and in the meantime they are displayed here with this caveat.

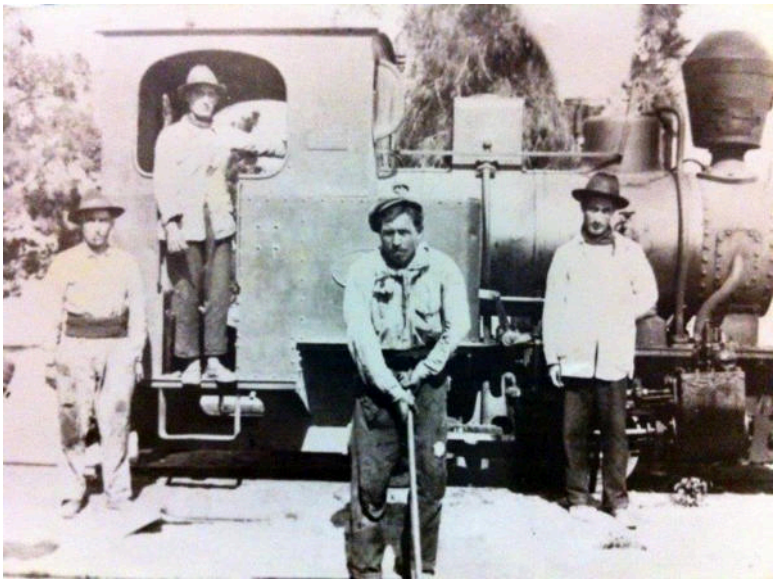
These two pics seem to show Krauss 0-4-0Ts in a sand pit. The locos differ in their buffer beams, chimneys, and in other details.



This photo was taken at precisely the same spot as the previous one, with a sand-processing plant in the right background, but on this occasion the loco was a small O&K with a 1920s style cast chimney.



A small Henschel, probably readily identifiable by having three plates on the cab and bunker sides.



Another shot of a Henschel, the cabside plates and other details suggesting that this was a different machine to that pictured above.

This loco, possibly an O&K, bears the fleet number **4** at the top of the cab backsheet.

9.5.2 *Km. 393 a Arrozal 33*

Background

Arrozal 33 is a rice-growing town in the Treinte y Tres department in eastern Uruguay. It is south east of Vergara on the ex CUR EER line to the Brazilian border. The guess must be that Km 393 was a *paradero* on that railway. The most likely route on Google Earth is 25 km long, heading north west from Arrozal until it meets the standard gauge. As this line will only have been laid in the mid-1930s, it largely used internal-combustion-engined locos. However, it hs been reported that two steam engines were in service in the early years.
See [38] and http://cosasdetreintaytres.blogspot.com/2017/01/el-trencito-del-arrozal.html for more detail.

Whilst this is clearly an internal-combustion-engined loco, the 0-6-0 chassis is likely to have come from a small German-built steam loco. Source [38] gives this the nick-name of **9 'El CANGREJO'** and says that it had a Mineapolis-Moline engine.

0-6-0? d/w ?, cyls. ?, built by ? in ?

Ordered for ? Source [38] suggests that there were two steam locos in use until the 1940s, as well as a variety of internal combustion locomotives built by Jung and others. and numbered from **1** to **12**. It is possible that the chassis of one of these later became **9 'El CANGREJO'** shown in the illustration above.

? w/n ?

? w/n ?

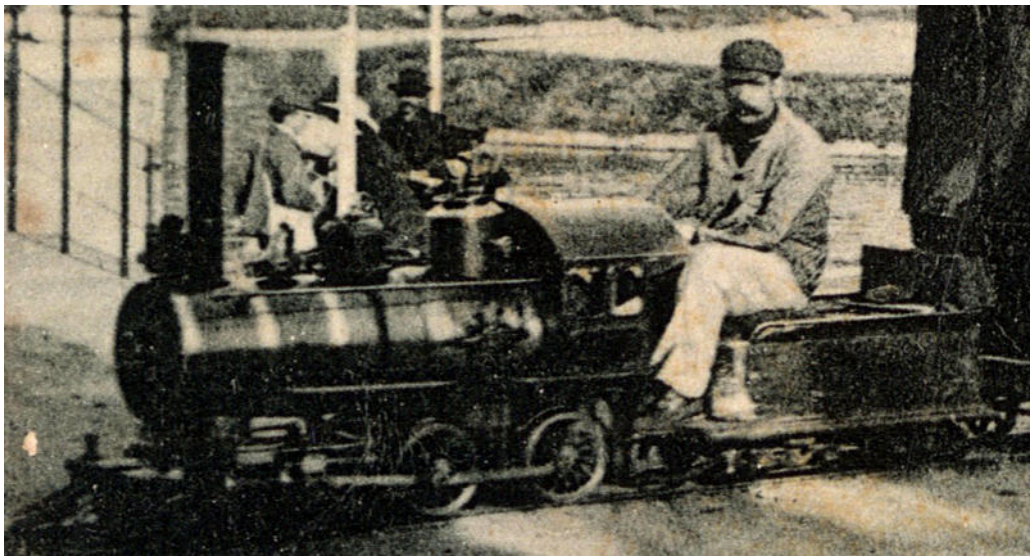
9.5.3 *El FC Liliputiense en el Parque Urbano de Montevideo*

Background

A

A postcard showing the *FC Liliputiense* train. The cars were almost certainly also supplied by Cagney.

4-4-0 Cagney d/w ?, cyls. ?, built by ? in ?



The Cagney type 4-4-0 in close-up. Note the greatly extended chimney, presumably to keep the smoke out of the driver's eyes.

9.6 Industrial railways

9.6.1 *Capitania General del Puerto de Montevideo*
Nac. Admin. del Puerto de Montevideo
later part of the *Agencia Nacional des Puertos*

Background

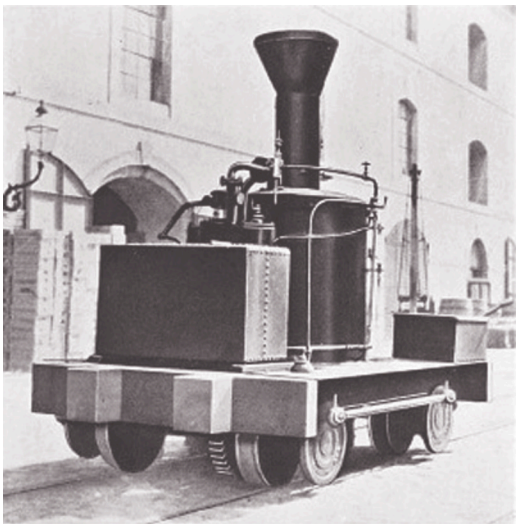
The early port based around the Maciel jetty had a rail network of 2' 6" or 3' 0" gauge, largely a pattern of straights joined by wagon turntables.

2' 6" or 3' 0" gauge

0-4-0VB d/w ?, cyls. ?, built by Alexander Chaplin & Co. probably in late 1880s

The limited evidence for the existence of these machines consists of a heavily-retouched picture in *The Locomotive* magazine in September 1910, and another with a loco in the distance. These are reproduced here. Rowland Abbott's Vertical Boiler Locomotives book [47] says they were obtained via W. A. Harley of Montevideo.

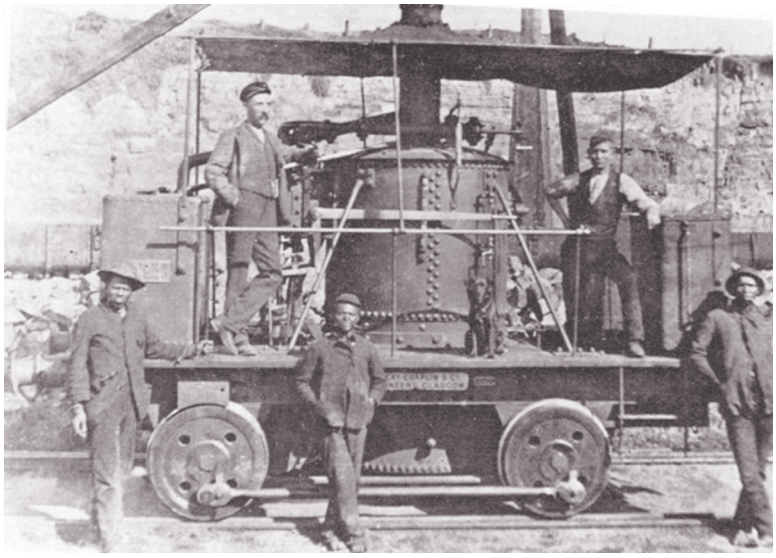
?	w/n 2461
?	w/n 2489



The photo from *The Locomotive*. The picture caption referred to it as 'narrow gauge', though 3' 0" appears more likely than 2' 6".

One of the two Chaplins stands just to the right of the building in the centre.

Other Chaplin engines, of various gauges, worked at East London harbour in South Africa and in Canada. The image below will obviously not precisely equate to the Montevideo engines but it gives some idea of what the images above were supposed to represent.



Port reconstruction

At the turn of the century the French contractor *Allard, Coiseau, Couvreux, Dollfus, Duparchy, Sillard y Wiriot* began the construction of new port facilities. During this period there was a 50cm network between the Teja quarry and the work site. This had a number of locos, one of which was:

0-4-0T d/w ?, cyls. ?, built by Decauville in 1909

Ordered for *Entreprise Général des Travaux du Port de Montevideo*, Uruguay. 03.02.1909

1A?	w/n 526	Later to *Indare SA* at Boca de Rosario where regauged to 60 cm and still survives.

This engine later moved to the construction of the CUR Eastern Extension Railway (section 9.5.5), and then to *Indare SA* (section 9.5.2) where it was regauged to 60cm.

The port works seem to have been completed in 1910. The new facilities had standard gauge tracks and a 3' 0" gauge system around the new central market area. In 1913 the standard gauge network was joined to the CUR mainline network. The 3' 0" gauge system ceased to operate at the beginning of the 1920s.

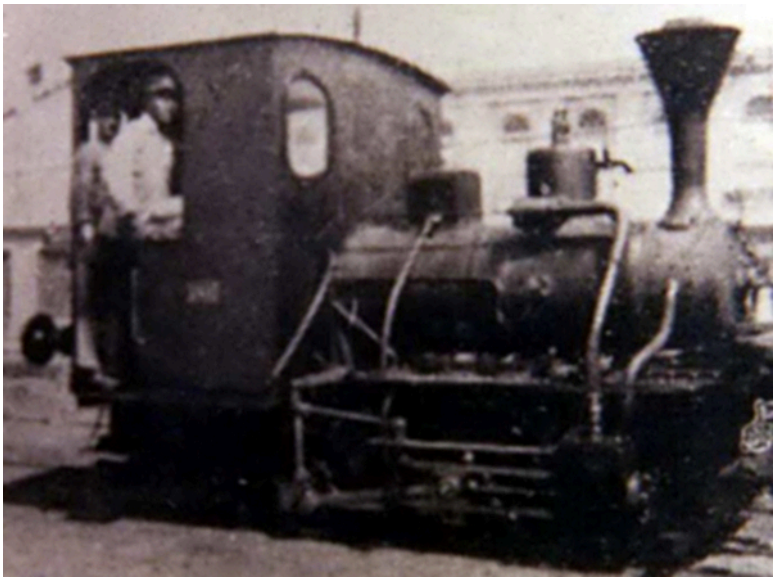
3' 0" gauge

0-4-0T d/w ?, cyls. ?, built by O&K in 1910 and 1913

One of these was 20hp and another 30hp. The first one was ordered for *Hafenbahngesellschaft*, Montevideo.

8	w/n 3957	Rebuilt to standard gauge in early 1920s at Varadero workshop.
9	w/n 4036	Rebuilt to standard gauge in mid 1920s
10	w/n 6096	20hp. Put up for sale, but was still at port, inactive, in 1936.

NB O&K 6095 also came to Uruguay. Where did that one go?



Standard gauge

0-6-0T d/w 1000mm, cyls. 420x620mm, built by O&K in 1912

Ordered for *Regierung Uruguay* via Ernesto Quincke, later recorded as working for the *ANP*.

1	w/n 5433	300hp. General repair 1921.
2 'La MARICERA'	w/n 5434	300hp. Working normally 1921. Rebuilt 1974 by *AFE*.

0-6-0ST d/w 42", cyls. 11x17", built by Manning Wardle in 1890

Ex CUR no. **2**. This engine, together with its sister 1197, had been purchased by the CUR for the Central Fruit Market of Montevideo. This latter organisation had gone bust in about 1906 and one of the Manning Wardle pair then came to the port.

3 'La MANICERA'	w/n 1198	Rear end substantially modified at some point, probably between 1913 and 1925. Under repair Nov. 1921 to May

1922. Continued working until 1950s, then used as a stationary boiler during 1960s. Boiler rebuilt in 1970s, using safety valves from a class X mainline loco. Then used for occasional tours of the port. Later abandoned but fortunately saved and taken over by CEFU. In working order.

MW 1198 still in use in Montevideo port during the 1980s, and bearing the name **'La MANICERA'**.

0-4-0ST d/w 39", cyls. 12x19", built by Black Hawthorn in 1890

This engine was built for the *FC del Este*, and was rented to the port authorities for a couple of years around 1920-22, before passing to the *FC y Tranvía del Norte* and becoming no. **13** in the *FTE* fleet.

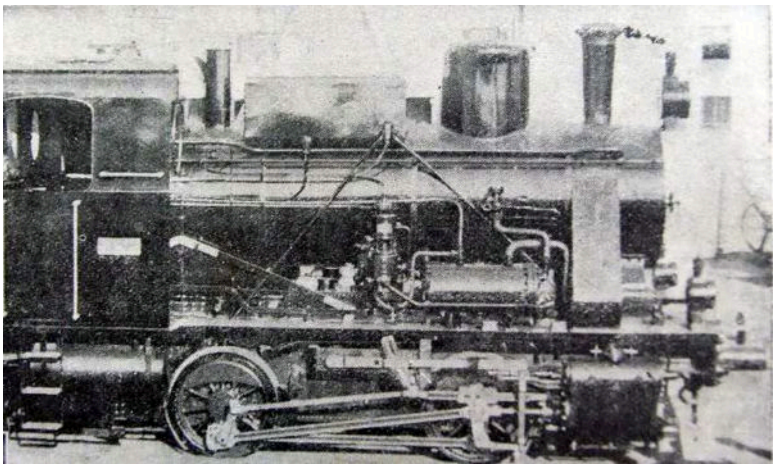
'PANDO' w/n 997

0-4-0WT d/w ?, cyls. ?, built by Linke Hofmann Laufhammer in 1925

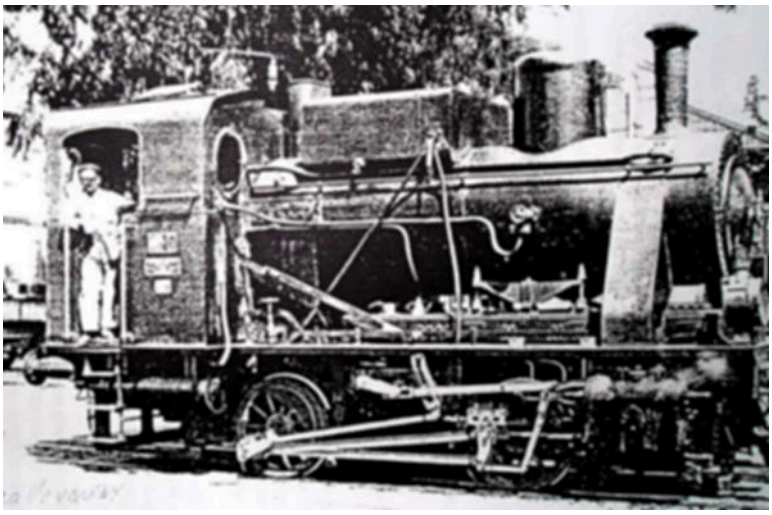
Fittted with air brakes. 320hp.

4 w/n 2669 But note LH list says was for 750mm gauge. Saved and now preserved by AUAR.

5 w/n 2670



Comparison of these two photos will show that the air pump and reservoir mounted on the running board in the first photo had later been removed. The tank on top of the boiler was presumably for oil fuel.



0-6-0ST d/w 48", cyls. 14x20", built by Robert Stephenson in 1891

Built for the Central Uruguay Railway, sold 1930-1 to the *Cía. Franco-Uruguaya de Obras Públicas*, then in 1935 purchased for the port.

6	w/n ?	Ex CUR no. **45**.
7	w/n ?	Ex CUR no. **46**. This one may never have actually worked at the port.

0-4-0T d/w ?, cyls. ? built by O&K in 1910

Rebuilt from 3' 0" gauge, see above.

8	w/n 3957
9	w/n 403

Other locos

Amongst the loco references quoted in [15] is a mention of locos **11** and **12** in 1921-2. Their identity has not yet been discovered. No. **11** paid visits to the *MOP* workshops, whilst no. **12** was working normally at the time.
Additionally, the Haine St. Pierre list has two locos as supplied to Montevideo port, Argentina in 1912. It is possible that these were nos. **11** and **12**.

0-6-0T d/w ?, cyls. ?, built by Haine St. Pierre in 1912

?	w/n 1167
?	w/n 1168

9.6.2 Km. 110 a Cantera Burgueño

Background

Km 110 is a *paradero* on the railway just west of the town of Pan de Azucar. About 7.5 km to the north are marble quarries at Nueva Carrara. Given that the quarries have been exploited since 1847 it may be assumed that any railway may have used steam power. It also purchased a 1948 Fowler 0-6-0 diesel which was later destined for a preservation project in the Lecocq Park in Montevideo that seems to have failed.

From 1900 the operators were the Fabini brothers. The following 60cm gauge O&K loco was supplied to Superville Fabini in Baron Montevideo and may well have worked here.

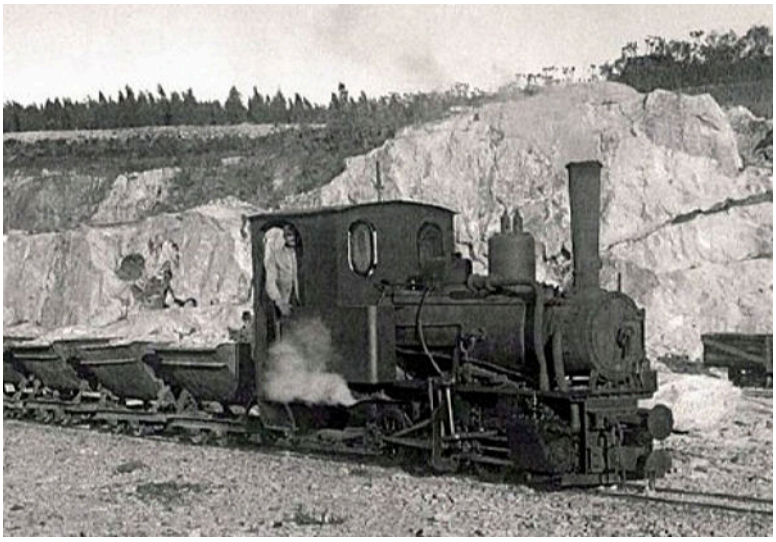
Purchase of Henschel loco in 1903, and then another in 1923 no. 19711 0-8-0T. Identical one sent in 1928, 21208 which worked on *FC de Santa Lucia* (Lado de San José) for same owners as Burgueno.

0-6-0T d/w ?, cyls. ?, built by O&K in 1908

? w/n 2647 40hp.

0-4-0T d/w ?, cyls. ?, built by O&K in ?

? w/n ?



0-8-0T d/w ?, cyls. ?, built by Henschel? in 1928?

The identity of this engine has not yet been pinned down, but Ferrostaal did supply a pair of 60cm gauge 0-8-0Ts to Argentina in 1929, nos. 21491 and 21493.

2 w/n ? Supposedly former *Compañia Nacional de cemento* railway). "This loco will be used in a tourist railway in the west of Montevideo.

A Henschel 0-8-0T lying derelict at the quarry. What may be the same loco is seen below as plinthed later in Piriapolis.

4w+4w two truck Shay d/w 22",cyls. (2) 6x10", built by Lima in 1906

Ordered by Superviele & Co., Montevideo. Class A 10-2. Empty weight 25,450 lbs. Not yet confirmed that it worked at this location but certainly Superviele & Co. had links with this operation. Built for 60cm gauge, empty weight 25,450 lbs.

1 'DOMINGO DE ARCE' w/n 1777

The loco shed at Cantera Burgueño.

0-4-0T d/w ?, cyls ?, built by Henschel in ??

'BESOZZI'	w/n ?	Now plinthed in quarry near Colón in Montevideo, but may have been sold to Brazil.

9.6.3 *El FC de Indare SA*, Boca del Rosario

Background

This sand quarry clearly very had a large number of small German 0-4-0Ts on the 60 cm gauge. Amazingly almost all of them survive.

"From 1928 onwards, the quarries were exploited at Boca del Rosario, which is a seaside resort on the River Plate estuary opposite Buenos Aires. The quarry company itself owns twenty-seven locomotives, one of which was built by Couillet for Decauville, the others being twenty-six of German design. All maintenance of locomotives and rolling stock was carried out by the company itself, which had extensive workshops at the quarry, with all necessary machinery and a foundry where all rail crossings, axle boxes and other parts were made. Over 30 miles of 600mm track was laid throughout the quarry, with a main line of about 10 miles in length. In August 1982, modern trucks replaced the railway, but the locomotives were all kept under cover with the purpose of preserving them. As an exception, the last train ran for British enthusiasts, on October 23, 1985. 0-4-0 well-tank locomotive No. **25**, built by Henschel as 28518 of 1950, headed it. Two years later, the track began to be removed, selling it to scrap merchants.

Recently the district has taken a public interest, and the proprietors of the quarries decided to reopen the railway. The trip is supplemented with a visit to the naval and railway shops where extensive renewals and repairs have been carried out on old machinery. Dating from 1928, an impressive generating plant of electric power also remains, in which several boilers, turbines, alternators, dynamos and control panels are maintained in good condition. In the museum at the quarry, about fifteen interesting examples of early stock are preserved on rails.

A railway novelty on the Uruguayan side of the River Plate coast was opened on January 2, 1999, running along a field into Indare Sand Quarries Co., covering a quarter of a mile. The gauge is 600mm. The line begins at the locomotive shed and concludes at the head of an old steam-operated bridge, now abandoned. In a future project, the railway would cross this bridge to extend the line more than 1½ miles. There is one locomotive in working order which was built by Orenstein & Koppel in 1912. This 0-4-0WT wood-fired engine carries her correct maker's plates 5835, and is numbered **15**. The passenger stock consists of ten open cars, each with a seating capacity for 4, and an additional one for 6." [3]

Fleet list in running number order

Running nos.	Builder	No.	Year	Power	Delivered to…	Location
1	O&K	1785	1906	20Hp	Fry Miers & Co. London	Running shed
1A	Decauville	526	1909	?	Ex Contractor Montevideo Port	Workshop
2	O&K	1755	1906	20Hp	Argentina	Storage shed
3	O&K	1784	1906	20Hp	Fry Miers & Co. London	Outside running shed
3[2]	O&K	11099	1926	20hp.	O&K laager, Buenos Aires	
4	O&K	1923	1906	20Hp	Antonio Ferro e hijos, Argentina (Punta Piramides, Argentina)	Storage shed
5	O&K	2030	1906	20Hp	Argentina	Workshop
6	O&K	4922	1911	20Hp	O&K, Buenos Aires for stock	Storage shed
7	O&K	10766	1923	20Hp	Ernesto Quincke, Montevideo	Workshop (?)
8	Neumeyer	5	1923	?	Uruguay	Storage shed
9	Jung	3979	1927	?	Von Österreich & Co, Hamburg	
10	Jung	3980	1927	?	Von Österreich & Co, Hamburg	
11	Jung	3850	1927	?	Von Österreich & Co, Hamburg	
12	Jung	4249	1928	?	Von Österreich & Co, Hamburg	
13	Henschel	21144	1929	?	Ferrostaal, Argentina	Storage shed
14	Jung	449	1900	?	Arthur Koppel, Berlin	Storage shed
15	O&K	5835	1913	20Hp	Bonneu Ibero Parodi & Figini, Argentina	Running shed

16	O&K	5836	1913	20Hp	Bonneu Ibero Parodi & Figini, Argentina	
16	Krauss	?	?	?	?	Near owner's house
17	Jung?	?	?	?	?	
18	Krauss	5718	1907	?	Arthur Koppel, Argentina	Outside running shed
19	Jung	4252	1929	?	Von Österreich & Co, Hamburg	Workshop
20	Jung	4248	1928	?	Von Österreich & Co, Hamburg	Workshop
21	Jung	3849	1927	?	Von Österreich & Co, Hamburg	Storage shed
22	O&K	4124	1910	40Hp	Puerto de La Paloma	Running shed
23	Henschel	19254	1922	?	Ferrostaal, Argentina	Near owner's house
24	O&K	4153	1910	30HP	O&K, Buenos Aires for stock	Near owner's house
25	Henschel	28518	1950	?	Von Österreich & Co, Hamburg	Running shed
26	Henschel	28519	1950	?	Von Österreich & Co, Hamburg	Workshop

Order of arrival

If the running numbers were allocated in arrival order it would appear that the following engines must have been purchased second-hand, and at around the dates shown:

1A from a contractor at Montevideo port, date unknown. This loco may well be carrying its previous owner's number.
14 Arrived around 1929?
15 from Bonneu Ibero Parodi & Figini, who were an engineering firm in Buenos Aires. Arrived around 1929?
16? Arrived around 1929?
17? Arrived around 1929?
18 Arrived around 1929?
22 Arrived from Puerto de La Paloma between 1929 and 1950?
23 Arrived between 1929 and 1950?
24 Arrived between 1929 and 1950?

0-4-0T d/w ?, cyls. ?, built by Decauville in 1909

Ex contractor at Montevideo port. The only locomotive from this builder in Uruguay. Originally 500mm gauge, with boiler number 5040. 3½ tons

1A w/n 526

No. **1A**, Decauville 526 of 1908. Photo by James Waite, 2013, from http://internationalsteam.co.uk/trains/uruguay22.htm

0-4-0T d/w ?, cyls. ?, built by Henschel

Ordered via Ferrostaal Argentina in 1922, to go to sand quarry Indare SA, Boca de Rosario [Uruguay]. Danzig type.

23 w/n 19254

The following 1929-built Fabia type loco is recorded as having been sold via Ferrostaal to the *YPF* at Comodoro Rivadavia in Argentina, but was more recently recorded as at this location.

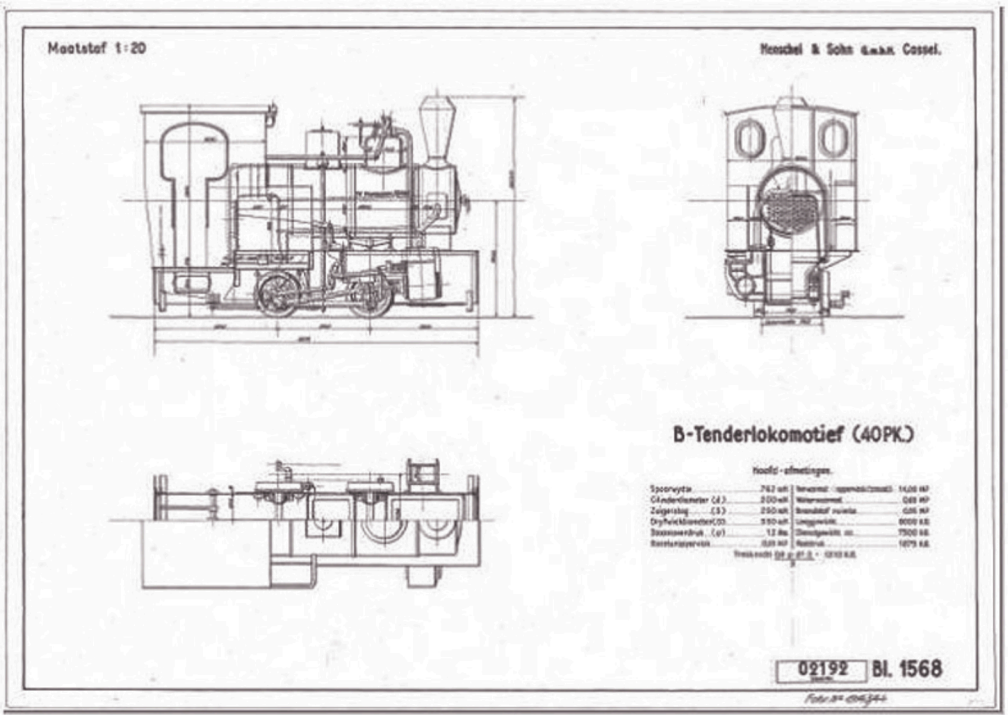
13 w/n 21144

Much later, in 1950, two more engines were supplied via Österreich & Co., Hamburg for Uruguay for sand quarry Indare, Boca de Rosario.

25 w/n 28518

26 w/n 28519

No. **23**, Henschel 19254 of 1922.



Henschel 'Danzig' type 0-4-0T sketch drawing sheet, as available from the Henschel Museum in Kassel.

No. **13**, Henschel 21144 of 1929.

No. **25**, Henschel 28518 of 1950, painted but not actually in working order.

No. **26**, Henschel 28519 of 1950.

0-4-0T d/w ?, cyls. ?, built by Arnold Jung

Built 1900. Ordered via the Arthur Koppel agency in Berlin. This loco is usually quoted as Jung 449/1900 but it appears to have many characteristics of an OK (eg Nº 24) but with Walschaerts valve gear. Both makers built locos with valve chest covers which sloped away from the locomotive.

14 w/n 449

All four were delivered in 1927-8 via Von Österreich & Co, of Hamburg. The running numbers vs the Jung numbers are unreliable. 3849 has been reported on Nº 9 (Jung List), Nº 10 (CRJ Nº 38, 1978) and Nº 21 (Fabian's list) [11].

21	w/n 3849
11	w/n 3850
9	w/n 3979
10	w/n 3980
20	w/n 4248
12	w/n 4249
19	w/n 4252

No. **14**, supposed to be Jung 449 of 1900.

No. **21**, Jung 3839 of 1929.

No. **9**, Jung 3979 of 1928.

An unidentified Jung.

Another unidentified Jung.

A third unidentified Jung.

No. **20**, Jung 4248 of 1929.

No. **19**, Jung 4252 of 1929.

0-4-0T d/w ?, cyls. ?, built by Krauss

There are three of these but only one has been firmly identified. It was built in 1907 for the Arthur Koppel agency in Argentina. Earlier reports describe Nº **16** (OK 5836/1913) as being sister locomotive to Nº **15** with only the cab remains and with other parts maybe scattered around the estate. The locomotive currently bearing **16** is more or less complete and appears to be a Krauss with an OK boiler (presumably off 5836).

16	w/n ?
17	w/n ?
18	w/n 5718

No. **18**, Krauss 5718 of 1907.

An unidentified Krauss.

0-4-0T d/w ?, cyls. ?, built by Neumeyer in

8 w/n 5 Has a MAN boiler. The only loco in Uruguay from this builder. Fritz Neumeyer AG of Munich only ever produced 43 locos.

No. **8**, Neumeyer 5 of 1923.

0-4-0T d/w ?, cyls. ?, built by O&K

2	w/n 1755	Built 1906. Ordered via Argentina. Often quoted as 1786, but that was an 0-4-4-0T for Java, confirmed by observation there ca. 1970.
3	w/n 1784	Built 1906. Ordered via Fry, Miers & Co. London.
1	w/n 1785	Built 1906. Ordered via Fry, Miers & Co. London.
4	w.n 1923	Built 1906 for *Antonio Ferro e hijos*, Puerto Piramides, Argentina (the Salina Grande salt railway on Peninsula Valdes in Patagonia. No. **4**'s original boiler is now on no. **6**.
5	w/n 2030	Built 1906 for Argentina. James Waite reports [11] that this locomotive carries a plate "Orenstein & Koppel - Arthur Koppel, Buenos Aires" which is not appropriate for it. It may have come from Nº 6 (4922/1911)
22	w/n 4124	Built 1910. Worked at the Port of La Paloma, cab only survives for certain but there is a suitable chassis for it as shown. 40hp.
24	w/n 4153	30hp. Supplied to O&K, Buenos Aires for stock in 1910.
6	w/n 4922	Built 1911, and delivered to O&K lager (stock) at Buenos Aires.
15	w/n 5835	Coal fired. Built 1913 for Bonneu Ibero Parodi & Figini, Argentina. d/w 20", cyls. 6x12", b/p 150 psi., TE 2,600 lb. and 20 HP.
7	w/n 10766	Wood fired. Built 1923 for Ernesto Quincke of Montevideo. 20hp.

No. **2**, O&K 1755 of 1906.

No. **3**, O&K 1784 of 1906.

No. **1**, O&K 1785 of 1906.

No. **4**, O&K 1923 of 1906.

No. **5**, O&K 2030 of 1906 on left, with another unidentified O&K on the right.

No. **22**, O&K 4124 of 1910.

No. **24**, O&K 4153 of 1910.

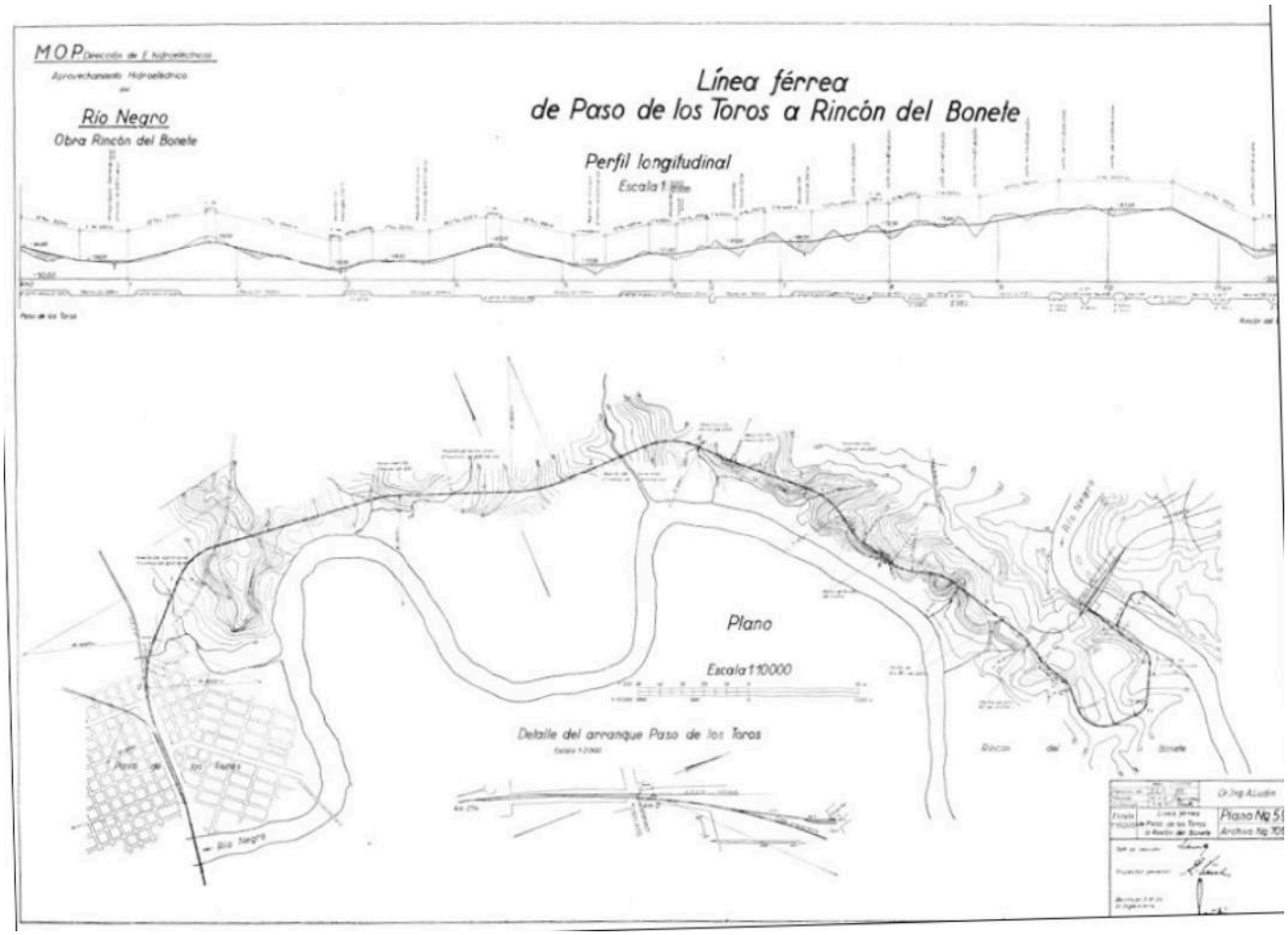
No. **6**, O&K 4922 of 1911.

No. **15**, O&K 5835 of 1913, the sole loco on site in working order.

9.6.4 The Rincón del Bonete dam project

Background

This dam and hydro-electric power scheme on the Rio Negro, upstream from Paso de los Toros, was initiated in 1937 by a German consortium which was to be paid in exports of meat, wool and leather, but was completed by the Americans in 1945 after the war had prevented the Germans from continuing. Whilst the railway systems on site included 60 cm gauge (without steam locomotives) and 3' 0" gauge, there was also an 11 km branch built from the CUR at Paso de los Toros which presumably was of standard gauge.



The thick black line shows the standard gauge branch to the dam site, with its steep 180 degree curve down into the valley at the northern end. The location of the narrow gauge is not currently known.

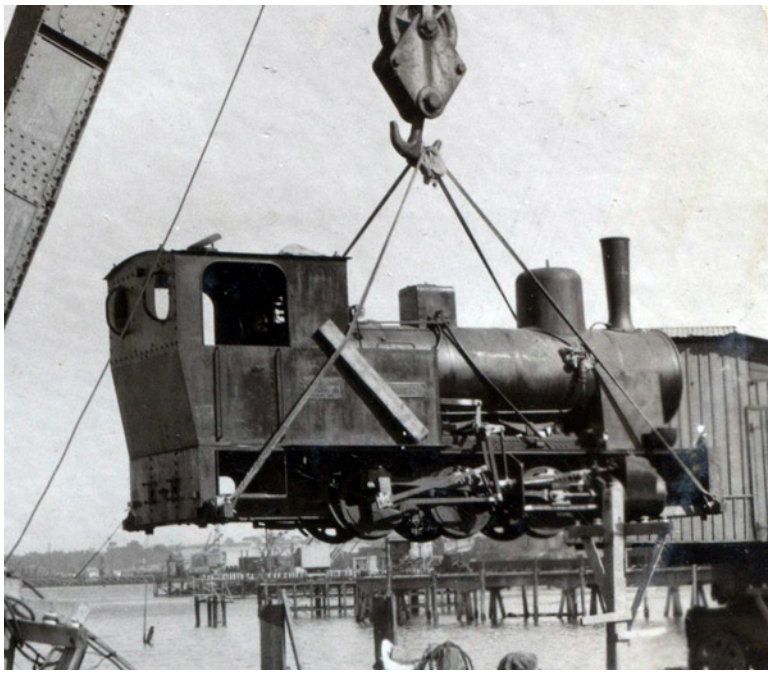
0-6-0T d/w ?, cyls. ?, built by Henschel in 1926 and ?

These 3' 0" gauge locos bore plates of the *Cía. General de Obras Públicas*, which was a member of the dam-building consortium, and had clearly been used on earlier contracts probably in Argentina. A photo below shows that there were at least three of this type of engine brought in for this contract, and probably five locos in total. Other Henschel 0-6-0Ts for the 75cm gauge had been delivered via the Ferrostaal agency but the final purchasers are not identifiable.

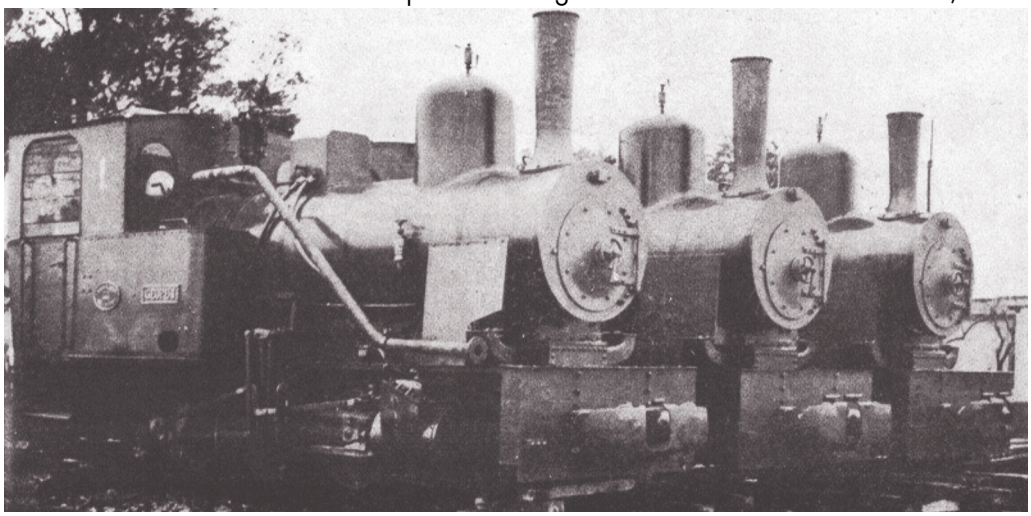
'GEOPE 1' w/n ?

'GEOPE 4' w/n 20750 Delivered new to the *GEOPE* in Buenos Aires in 1926.

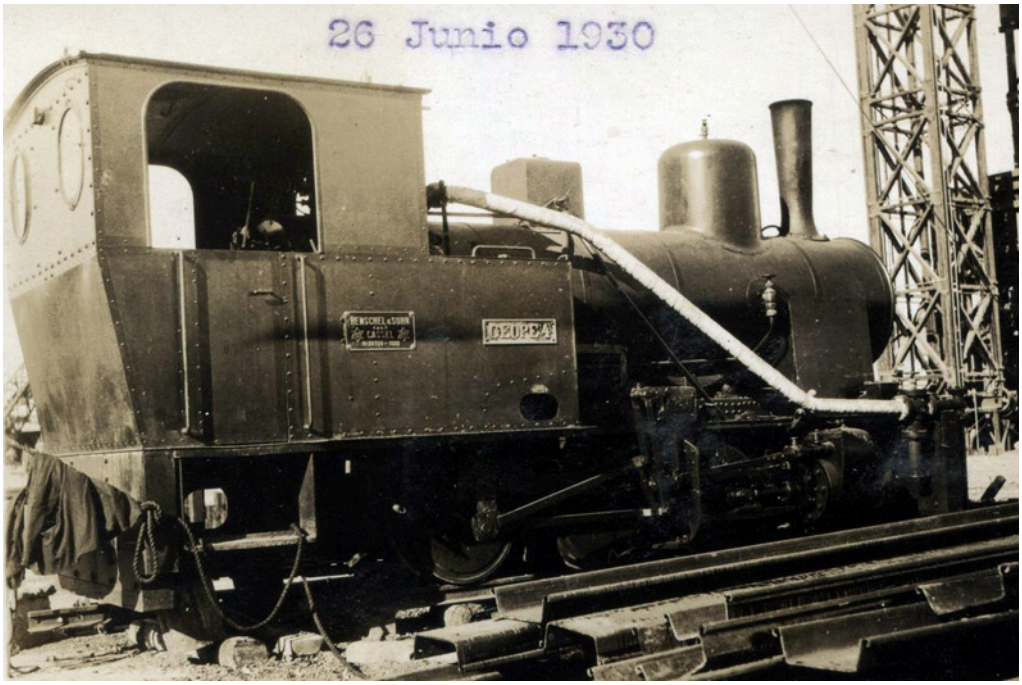
? w/n ?

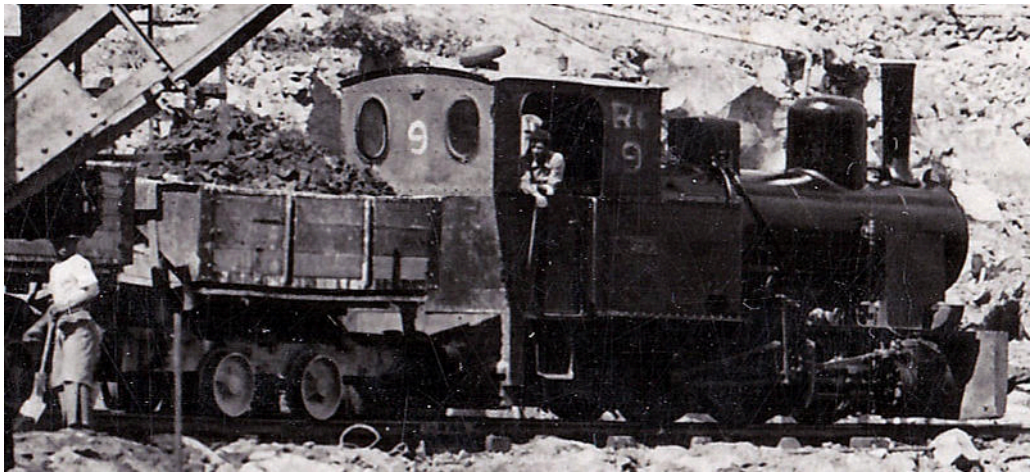


These Henschel 0-6-0Ts with plates bearing the initials GEOPE and a number,



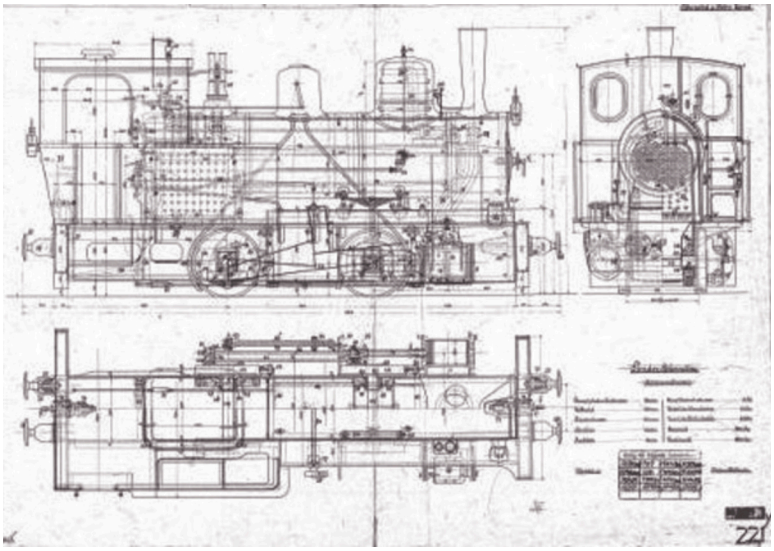
GEOPE 1 is the nearest of the three locos above, whilst **GEOPE 4** is seen below.
The white lagged pipes resting beside the boilers are not permanent fittings on the engines, but were fitted when the engines were used as stationary steam generators for other equipment as was happening in the picture below.





This cropped image, from the *Museo Rincón del Bonete* page on Facebook, shows one of the Henschel 0-6-0Ts bearing the running number **9** on cabsides and rear. It is seen in use in an area of excavation with a large DEMAG excavator to the left.

This company also had purchased Henschel 20880 of 1927, a 75cm gauge 0-4-0T of the Helfmann type. A drawing of the Helfmann type is illustrated below.



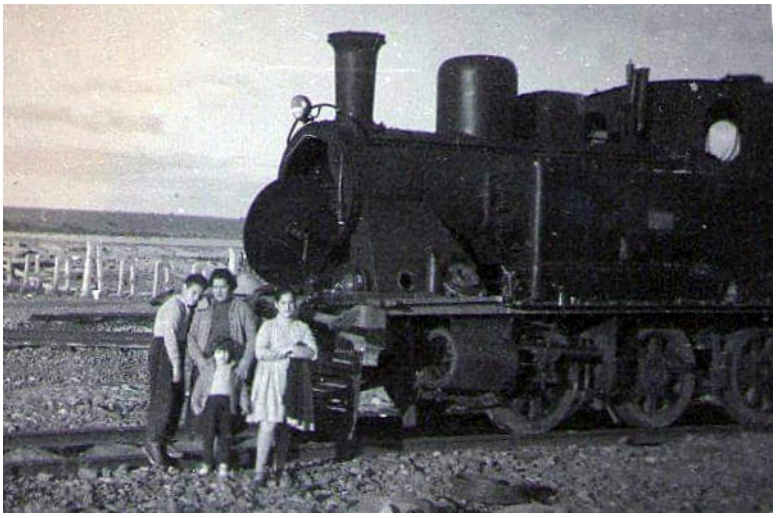
Whilst the photo below, supposedly taken during the Rincón de Bonete contract, does not show this precise design, it is possible that the wrap-over cab roof and the side tanks were later variations on the basic design. The dome is also further back than in the drawing.

This picture, also from the Facebook page of the Museo Rincón del Bonete, shows three steam engines working in an excavation site of some kind. The resolution of the image was not particularly high but it was possible to see that the nearest loco, probably the second one just to the right of the big excavator, and possibly even the third one up on the ledge at the back, were of the 0-4-0T Henschel Helfmann design illustrated above.

0-?-0T d/w ?, cyls. ?, Built by ? in ?

At least one standard gauge tank loco was used on the branch from Paso de los Toros, but few details are known.

? w/n ?

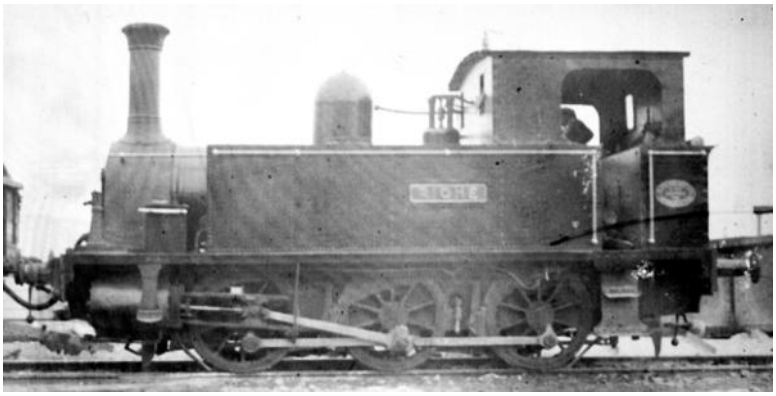


This photo posted on the *Ferrocarriles Uruguayos (A.T.U.)* Facebook page by Horacio Rodriguez in March 2021, apparently shows a derelict loco at the Rincon del Bonete dam site sometime after 1959. It would appear to be a German-built 0-6-0T and is not one of the 3' 0" gauge engines shown above. The wooden stakes in the left background were apparently the remains of a 3' 0" gauge bridge, and it is that which enabled the dating of the photo.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

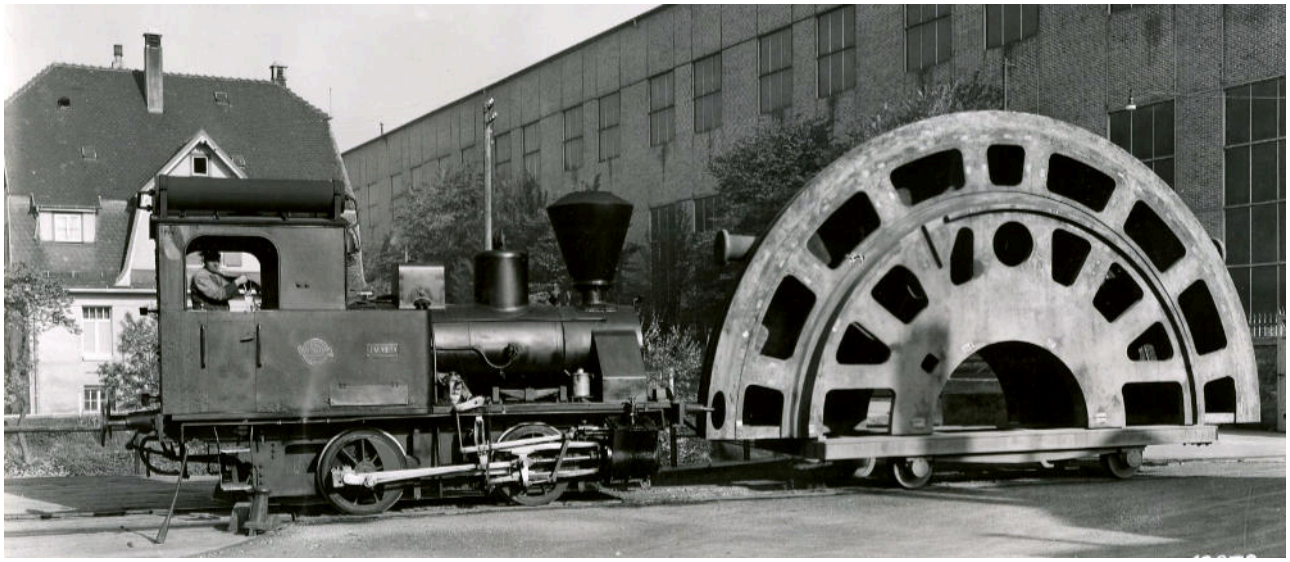
The photo below shows one of this ex Midland Railway pair bearing the name **'RIONE'** and supposedly working at the Rincon de Bonete site. My guess is that this was no. 922 which had moved on from the Midland to the *FC y Tranvía del Norte*, and then on to the *FFCC del Estado*, for no. 923 which had gone to the CUR had received minor modifications in the course of its life such as a new front spectacle plate with round rather than rectangular openings, and a different chimney.

? 'RIONE'	w/n 922	Originally **1 'QUEGUAY'** of the Midland railway. Sold on to *FC y Tranvía del Norte*, and then on to *FFCC del Estado*. Ownership whilst working here unknown.



A misleading image

Whilst the following photo was also displayed on the *Museo Rincón del Bonete* page on Facebook, it is rather misleading. The locomotive is one of the three O&K 0-4-0Ts that were used by J. M. Voith Maschinenfabrik at their Heidenheim plant in Germany. These were O&K nos. 1789, 2008 and 2505 of 1907-7. Whilst first sight of this photo imspired speculation that possibly Voith had brought a locomotive to the Rincon del Bonete site to assist in the construction work, the house in the background looks very Germanic and it is much more likely that this merely shows parts for the Uruguayan contract being moved around the Heidenheim factory.



9.6.5 The T. A. Walker Co. quarries and town at Conchillas

Background

In 1880 work started on the creation of a new artificial port for Buenos Aires, which did not have a large natural harbour like that at Montevideo. Much of the work was contracted to the T. A Walker company, which after Thomas Andrew's death in 1889 became C. H. Walker and Co. Materials were gathered from all over the River Plate area including from Uruguay which possessed more abundant suitable rock than the Argentine side of the estuary.

A particular focus was the area known as Conchillas, about 33 km NW of the city of Colonia and 50 km NE of Buenos Aires. A company town grew up there under the Conchillas name, with subsidiary settlements at Puerto Ingles on the coast and at Pueblo Nuevo and Cantera no. 5. Activity continued right though until the Walker company pulled out in the early 1950s. Conchillas today is something of a heritage destination, for many of the 'English town' features still remain.

A substantial standard gauge railway system developed to transport stone to the coast, with a narrow gauge network for the sand that was also needed. As [6] states, "*Estas vías férreas eran la comunicación con el Puerto Inglés para el transporte de la piedra desde las distintas canteras y posteriormente el transporte de granos desde el comercio del Sr. Evans, socio de la Empresa y abastecedor de mercaderías a la misma, de la población de Conchillas y de toda la zona.*

Disponían de cinco locomotoras de 6 ruedas a vapor de alta potencia denominadas "Curva del Llano", "Parish", "Chavarría", "Thorton", y "Gogland". Además había 4 de 4 ruedas de mediana potencia:"Irigoyen", "Ortiz", "Gilmore" y "Zabalía", (Figuras 4 y 5) que se complementaban con 300 vagones de distinta función para distintas cargas. Las rocas eran extraídas mediante el uso de barrenos de pólvora, de las canteras creadas en bruto con destino a la construcción del puerto de Buenos Aires. Hoy es posible ver todavía estas construcciones y los denominados Polvorines a unos 4 km del pueblo."

Standard gauge locomotives

These have been identified by correlating the names listed, not always accurately, above, with the engines supplied with similar names to T. A. Walker by Hunslet and Manning Wardle. These were in the main shipped first to Buenos Aires where Walkers had several dozen locos in service. Onward movement to Uruguay was merely in the nature of an internal company arrangement and no doubt some stays were of longer duration than others. These engines correlate almost perfectly with a Conchillas fleet list provided by John Poole to P. C. Dewhurst in 1945.

0-4-0ST d/w ?, cyls. ?, built by Hunslet in 1887 and 1888

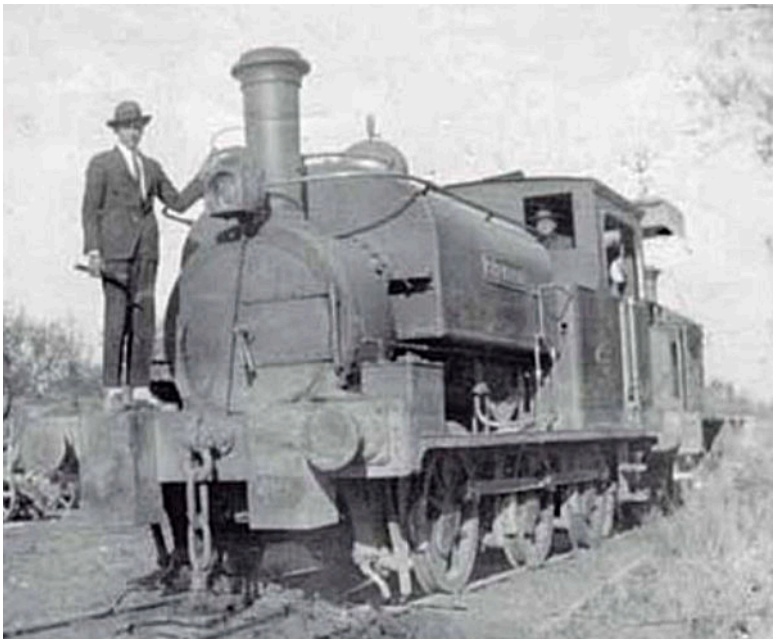
Ordered by T. A.Walker & Co. for their Buenos Ayres contract.

'ZAVALLÍA'	w/n 419	Note that whilst Brian Rumary's Hunslet list confirms that 419 was ordered by T. A. Walker, it names the loco as **'AYUDANTE'** and then says it was operated by Charles Walker & Co. Ltd. of Water Orton as their no. **2 'AYALIA'**.
'GILMOUR'	w/n 443	

0-6-0ST d/w 37"?, cyls. 13x18"?, built by Hunslet in 1888

Ordered by T. A. Walker & Co. for their Buenos Ayres contract.

'CHAVARRÍA' w/n 465

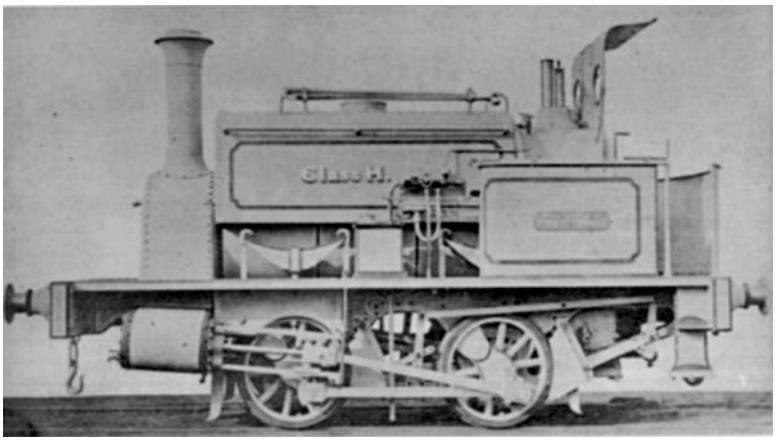


A Hunslet 0-6-0ST pictured at Conchillas in source [6]. Note that there is an unidentified side tank loco immediately behind.

0-4-0ST d/w 36", cyls. 12x18", Built by Manning Wardle in 1887

Ordered by T. A. Walker & Co. For Liverpool, presumably for shipment to Buenos Aires. MW class H. Despatched 16 April 1887.

'YRIGOYEN' w/n 988 Rebuilt by MW in 1913 according to a list in a 1945 letter from John Poole to Paul Dewhurst.

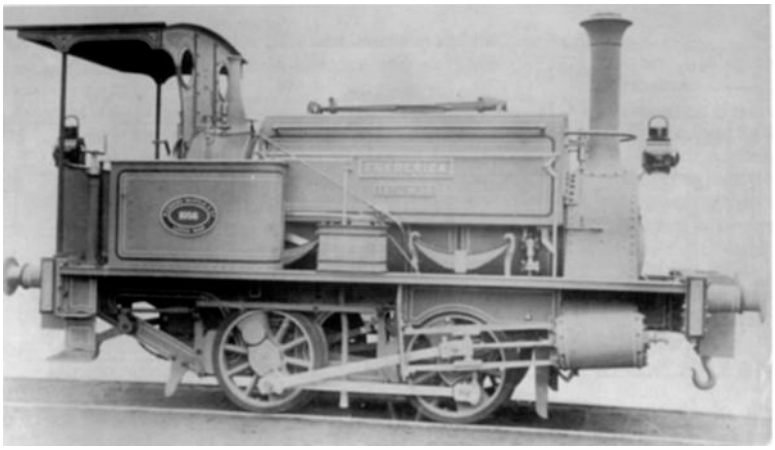


A standard MW class H loco.

0-4-0ST d/w 33", cyls. 10x16", Built by Manning Wardle in 1887

Ordered by T. A. Walker & Co. for Buenos Aires. MW class F. Despatched 26 April 1887.

'ORTIZ' w/n 1015

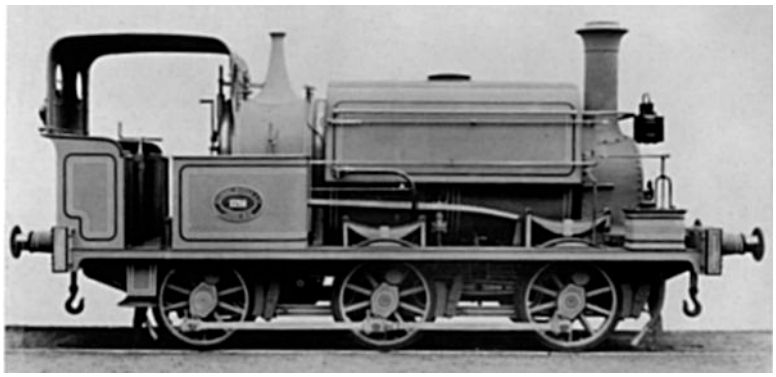


A standard MW class F loco.

0-6-0ST d/w 36 or 37½", cyls. 12x17", Built by Manning Wardle in 1888

Ordered by T. A. Walker & Co. for Buenos Aires. MW class K. Despatched 25 January 1888.

'THORNTON' w/n 1032



A typical MW class K loco. Note the smaller splashers than on the Old Class I locos used by the Uruguayan mainlines.

0-6-0ST d/w 36", cyls. 13x18", Built by Manning Wardle in 1888 and 1889

Ordered by T. A. Walker & Co. for Buenos Aires via Liverpool. MW class M. Despatched 15 August 1888 and 28 June 1889.

'RUIZ de los LLANOS' w/n 1093 Rebuilt by MW in 1913 according to a list in a 1945 letter from John Poole to Paul Dewhurst.

'COCHLAN' w/n 1113

A typical MW class M loco, in this case as supplied to T. A. Walker for use in the UK. Whilst first glance this appears to be almost identical

to the loco above, note that this class of engine has no splashers above the driving wheels.

The loco is '**COGHLAN**', MW 1113, though it is uncertain as to whether the location is in Uruguay or Argentina.

0-6-0ST d/w 42", cyls. 14x20", Built by Manning Wardle in 1889
Ordered by T. A. Walker & Co. for Buenos Aires. MW class Q. Despatched 26 June 1889.
'PARISH' w/n 1104

Other locomotives

The nine engines named in the reference quoted above have all now been identified here. Of course there may also have been others brought over from T. A. Walker's large fleet at Buenos Aires. Whilst the majority of these will have looked like one or other of the engines illustrated above, T. A. Walker also purchased custom-built side tank locos from Manning Wardle. One of these, **'PELLIGRINI'** MW no. 1006, is illustrated below to aid identification in case any of them should crop up in photos taken in Uruguay.

MW 0-6-0T 1006 **'PELLIGRINI'** supplied to T. A. Walker at Buenos Aires.

Narrow gauge locomotives

60 cm gauge. Whilst no direct information has been found about narrow gauge engines at this location, the Couillet list is evidence that at least one of their locos may have come here:

0-4-0TT d/w ?, cyls. ?, built by Couillet for Decauville in 1886

Ordered for the Decauville dealer *Portalis Freres Carbonnier et Cie.*, Buenos Aires, for the *Carrières de la Con-*

chillas, ie. the quarries at Conchillas.

'CONCHILLAS' w/n 864 (Decauville w/n 45) Delivered with blank name-plates.

0-4-0T d/w 600mm?, cyls. 185x300mm, built by O&K in 1910

The photo below seems to show a very small O&K, reputedly at Conchillas. However, whilst it has not been precisely identified, the O&K list does include

? w/n 4222 A 40hp loco built in 1910 for 60cm gauge, for Maffei y Cia., Conchillas, Argentina.

9.6.6 Uruguayan Portland Cement Co.

Background

3' 0" gauge. Location was at the Cantera del Verdúm (sometimes written Verdún), otherwise known as the minas Lavalleja, west of the town of Minas. These are still in operation, with a branch from the standard gauge route west of the Minas terminus. In the 1910s the site was owned and operated by the Metzen - Vincenti company mentioned earlier, and they are supposed to have had at least one 60cm gauge loco there until 1919 when the business was sold. During the 1920s the new company had purchased three petrol/gas/nafta locos from Plymouth and VIW, nos **1-3**.

0-4-0T d/w 24½", cyls. 7x12", built by Vulcan Iron Works in 1930

4 w/n 4099

Later had Henschels from the Rincon del Bonete scheme, but of a different gauge?

9.6.7 Goldfields of Uruguay Ltd
San Gregorio mine

Background

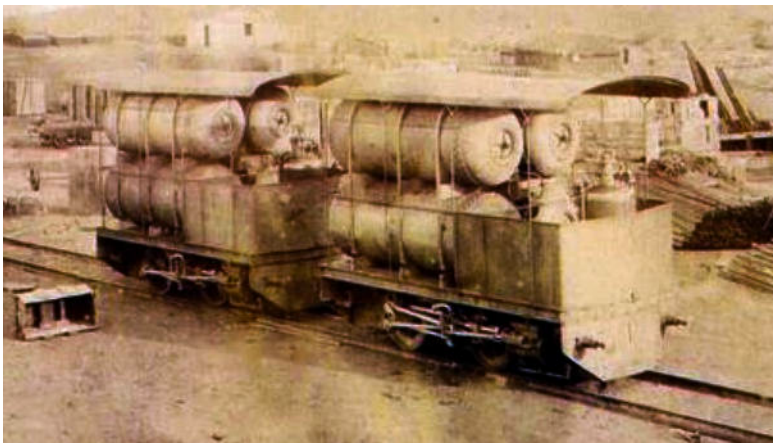
2' 0" gauge. This mine, which was still being exploited until very recently, is in the north of Uruguay, about 50 km east-north-east of Tacuarembó. Prior to operation by this company, the mines had been run by a French company, *la Compañía Francesa de Minas de Oro del Uruguay*, using a pair of Mekarski patent compressed air locos.

0-4-0CA d/w ?", cyls. ?", built by ? in ?

Ordered for ? None of the obvious internet sources of information about Mekarski, or about compressed air locomotives generally, show up any clues as to the builder of these locos.

? w/n ?

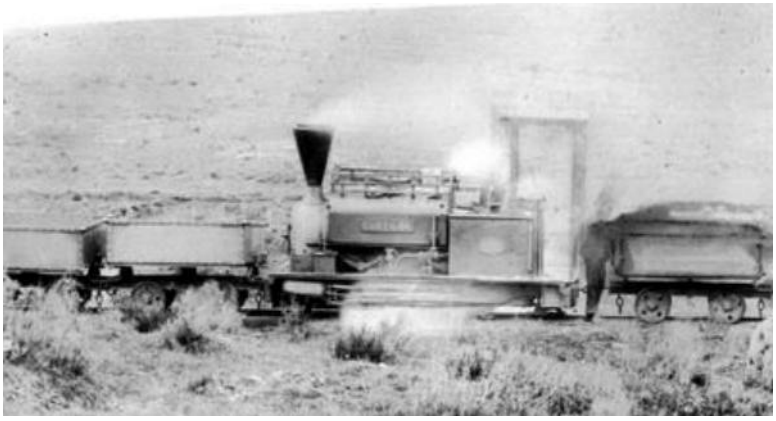
? w/n ?



0-4-0T d/w 20", cyls. 6x10", built by Black Hawthorn in 1888

Ordered for Goldfields of Uruguay Ltd., San Gregorio Mine.

'CLOTILDE' w/n 943



This small saddle tank loco is supposed to be **'CLOTILDE'**.

9.6.8 Metzen, Vincenti y Cia. Montevideo

Background

In 1909 Metzen & Vincenti purchased the *Cantera del Verdúm* at Minas, see below. However, in 1919 the whole business passed to the International Portland Cement Corporation of the USA. The local assets were formed into the *Cía. Uruguaya de Cemento Portland* or *CUCP*. The company presumably must have had other activities and locations, for it is unlikely that the locos below worked at Minas.

60 cm gauge

0-8-0T d/w ?, cyls. ?, built by O&K in 1908

Purchased via Ernesto Quincke, agent, for Metzen-Vincenti & Cia, Montevideo, Argentinien

?	w/n 2856	50hp.

O&K	w/n 2856	1908	50 PS	Dt 600.05.1908

0-4-0T d/w ?, cyls. ?, built by O&K in various years

Purchased via Ernesto Quincke, agent.

?	w/n 5633	Built 1912.
?	w/n 5837	Built 1913.
?	w/n 5838	Built 1913.
?	w/n 5999	Built 1913. 40hp.
?	w/n 10512	Built 1924.
?	w/n 10766	Built 1923.
?	w/n 10767	Built 1923.
?	w/n 11014	Built 1925.
?	w/n 11201	Built 1926.
?	w/n 11366	Built 1927.
?	w/n 11611	Built 1928.
?	w/n 11652	Built 1928.

75 cm gauge

0-4-0T d/w ?, cyls. ?, built by O&K in 1910

Purchased via Ernesto Quincke, agent.

?	w/n 3725	
?	w/n 4741	40hp.

9.6.9 *Puerto de La Paloma*

Background

This was the starting point for the Uruguay Railway inland to Rocha. The only real evidence that there was a narrow gauge port line at this location is that *Indare SA* no. **22** is supposed to have come from there.

0-4-0T d/w ?, cyls. ?, built by O&K in 1910

?	w/n 4124	40hp. Later to *Indare SA* at Boca de Rosario, where it still exists as their no. **22**. See section 9.5.2.
?	w/n 4999	

9.6.10 A timber railway at Haedo near Fray Bentos

Background

Nothing is known about this enterprise apart from the photo below, which supposedly shows a loco at Estación Haedo in 1942. Haedo is a couple of stations north-east of Fray Bentos on the Midland Railway branch. The engine is clearly a small O&K, probably 20hp and on 60 cm gauge track. The wagons in the original larger photo were loaded with fire-wood.

0-4-0T d/w ?, cyls. ?, built by O&K in?

? w/n ?

9.6.11 Civil engineering contracts and contractors

Mauá bridge construction

Background

The Barón de Mauá bridge links Uruguay and Brazil across the Río Yaguarón, between Río Branco in Uruguay and Yaguarón in Brazil. It carries a rail route as well as a road. Construction was between 1927 and 1930. The loco below was pictured during the project. It may have belonged to a Brazilian civil engineering company carrying out the work.

Dirección de Vialidad

Background

60 cm gauge. National roads authority. Usual O&K list only specifies *Direccion de Vialidad* for first batch, but not which country. For second batch it gives *Empresa Constructora Costamalle*, Uruguay, as the purchaser.

0-4-0T d/w ?, cyls. ?, built by O&K in 1924 and 1929

? w/n 10513
? w/n 10514
? w/n 10515
? w/n 11869
? w/n 11870

In 1927 the *Dirección de Vialidad* at Montevideo purchased three replacement boilers '*ersatzkessellen*' from O&K, nos 11532-4. This might imply that they also owned earlier O&K locos.

CUR construction of Eastern Extension Railway

Background

50cm gauge. (Written as 1' 7 11/16" in Bagnall list).

0-4-0T d/w 19", cyls. 5x7½", built by Bagnall in 1909

Ordered for the CUR Eastern Extension Railway, presumably for construction works. *The Locomotive* magazine of May 15th 1916 commented:

"TANK LOCOMOTIVE, CENTRAL URUGUAY EASTERN EXTENSION RY. WE illustrate a special small locomotive built by Messrs. W. G. Bagnall, Ltd., for the above railway to the inspection of Messrs. Livesey, Son & Henderson, consulting engineers to the line. As will be seen from the photo. it is a remarkably neat design for so small an engine, and it is fitted up in quite main line style. The following are the leading particulars:— Cylinders, 5-in. diameter by 7½-in. stroke; wheels, 1-ft. 7-in. diameter; wheel base, 2-ft. 6-in.; gauge, 50 c/m; total height, 7-ft. 3-in.; width, 4-ft. 9-in.; length over central buffers, 11-ft. 3-in. Boiler barrel, 1-ft. 9-in. diameter by 4-ft. long of ¼in. steel plate with 34 solid drawn brass tubes, 1½ in. diameter outside. Fire-box shell 2-ft. 3-in. long by 1-ft. 1 1/8-in. wide; 5/16-in. plates; copper firebox, 1-ft. 10 1/8-in. long by 1-ft. 5¼-in. wide by 2-ft. deep; 3/8in. copper plates. Tube plate 9/16-in. where tubes pass through, 7/8-in. copper stays at sides. Roof stayed by solid wrought iron girder stays. Heating surface: 56.9 sq. ft. in tubes; 11.5 sq. ft. in firebox; total, 68.4 sq. ft. Grate area, 2.1 sq. ft. Working pressure, 140 lbs. sq. in. Ramsbottom safety valve, 1¼-in. diameter. Side tanks have a capa-city of 70 gallons and bunkers hold 3 cwt. of coal.

The locomotive is fitted with Dewrance's water gauges and pressure gauge, etc., Gresham's No. 2 m/m injectors and all the usual boiler mountings. The valves are placed on top of the steam chests and are operated by Bagnall and Price's valve gear. Hand sanding gear is fitted, the boxes being neatly placed between the boiler and tanks. The weight in working order is 4½ tons."

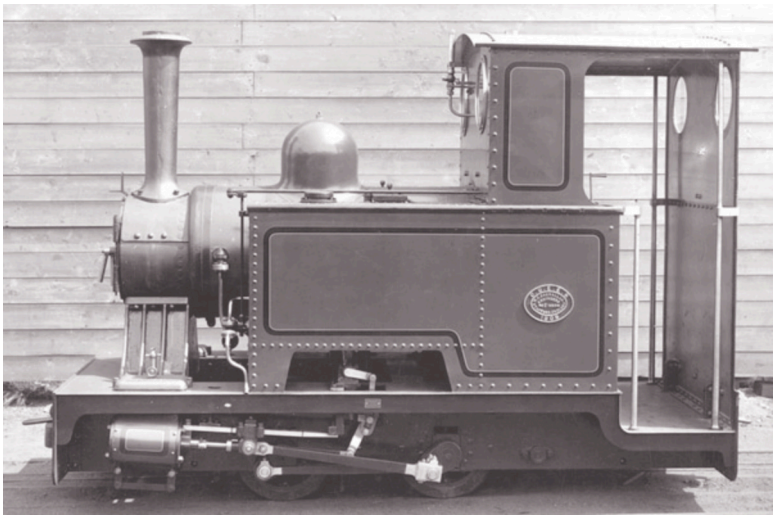
? w/n 1896

? w/n 1897

? w/n 1898

? w/n 1913

Fabian Iglesias Pérez has suggested [on the *Ferrocarriles Uruguayos (U.T.E.)* Facebook page] that these engines moved to Argentina after the EER had had been completed. However, he also says that the track panels and possibly some other locos were sold to *La Floresta SA* which began the construction of a forestry business and associated company town on the coast east of Montevideo.



Two of these Bagnalls at work tipping spoil to build up an embankment on 'the 33 line', the Eastern Extension Railway route to Treinte y Tres.

Perry Cutbill de Lungo & Co.

Background

Contractor, built a number of lengths of railway in Uruguay. Went bankrupt in 1891.

0-6-0T d/w 42", cyls. 12x20", built by Black Hawthorn in 1887

See Midland Railway section for the origin of this loco. After use on the construction of the Midland it came to Perry Cutbill de Lungo for the building of the Northern. It moved on with the contractor and never entered the Northern 's regular operating fleet.

2 'DAYMAN' renamed **'SAINT EUGENE'** w/n 923 The name was later translated to **'SAN EUGENIO'.** Later sold to the CUR, in 1896.

Empresa Constructora Costemalle

Background

This was clearly a big civil engineering contractor, for the name crops up in a number of railway building projects. One source suggests that a long 600mm line may have operated from Nueva Palmira to Bizcocho on the CUR Western Extension, but that is difficult to believe.

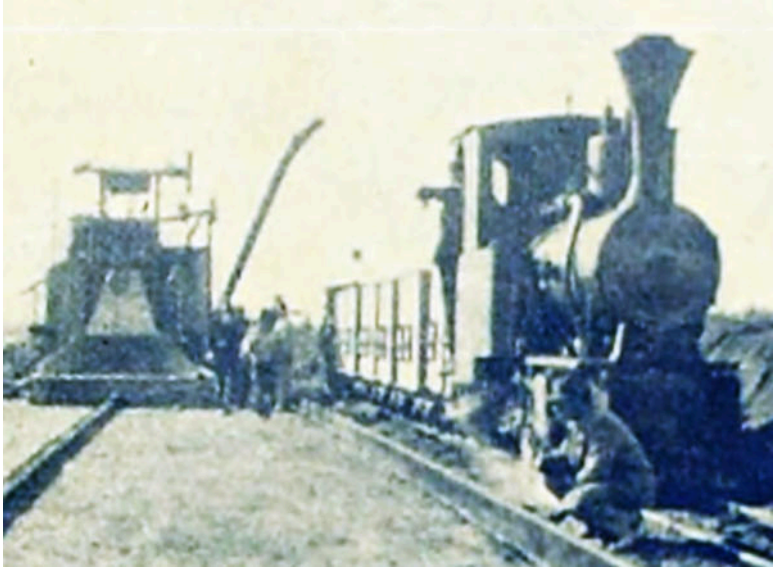
0-4-0T d/w 600mm?, cyls. 210x300mm, built by O&K in 1929

?	w/n 11869
?	w/n 11870
?	w/n 11971
?	w/n 11972
?	w/n 11973
?	w/n 11974

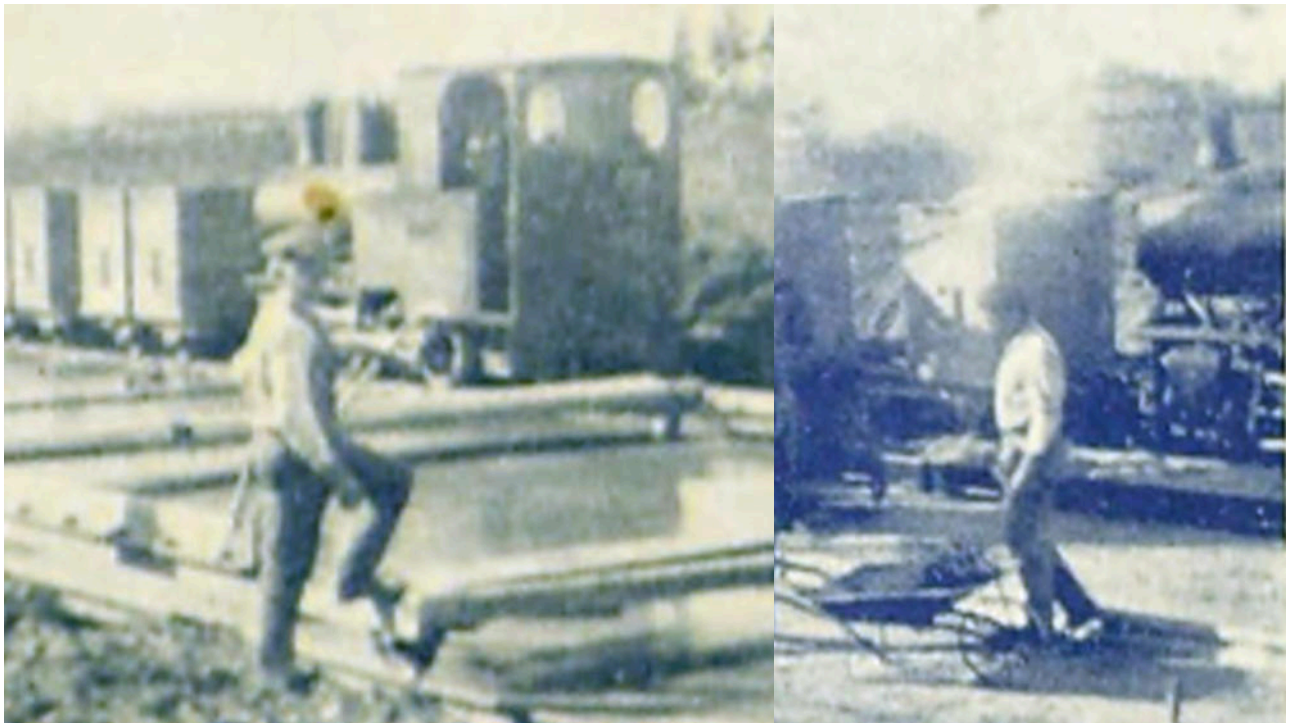
Building the *Ruta 1* road in 1930

Background

Ruta 1 is the main road linking Montevideo with Colonia de Sacramento, 110 miles west along the coast. Contemporary photographs show two small German-built tank locos bringing wagons of concrete to the point where the new carriageway was being laid. One is definitely by O&K, whilst the other



The O&K brings a train of concrete containers up to the machine spreading the liquid concrete to create the new carriageway.



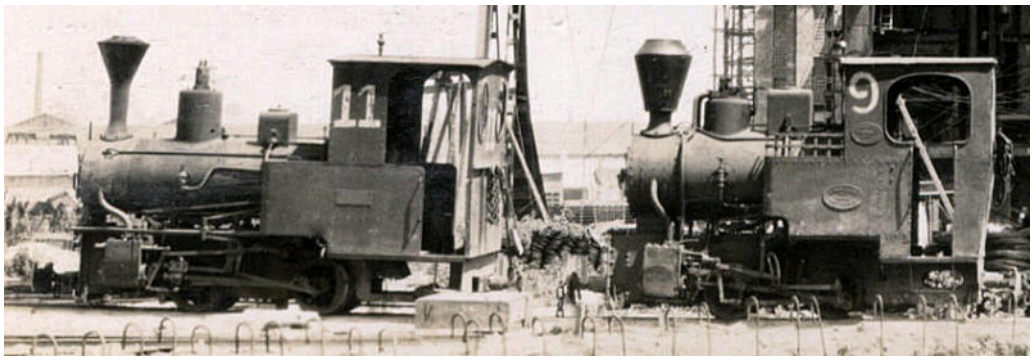
The other loco seen in these press images of the time was probably by ??? The right hand partial image is included here as it showed the front of the engine (and only the front) rather more clearly than did the other photo.

Construction of the power station *Central Termoeléctrica José Batlle y Ordóñez* in Montevideo, from 1930 onward

Background

The *Central Batlle* is a major thermal power station in Montevideo. It is still in operation today. The photo below

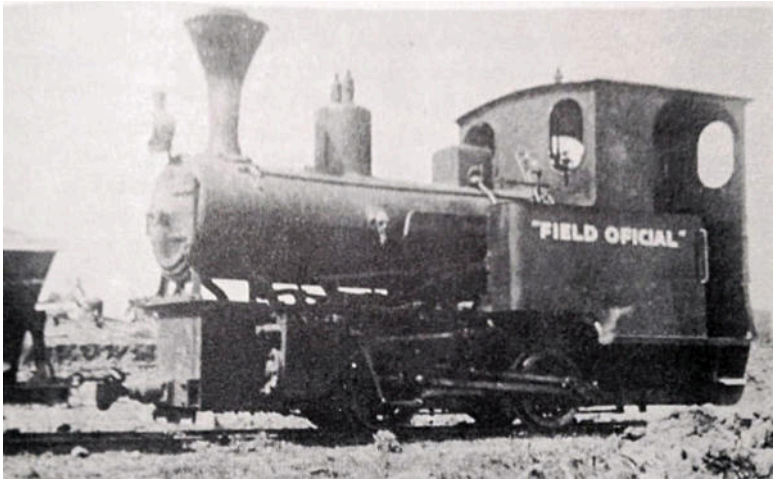
was dated 1931 and shows two steam locos in use during the plant's construction. As these are numbered **9** and **11** it seems likely that the project used a large fleet of locos. The gauge was probably 60cm.



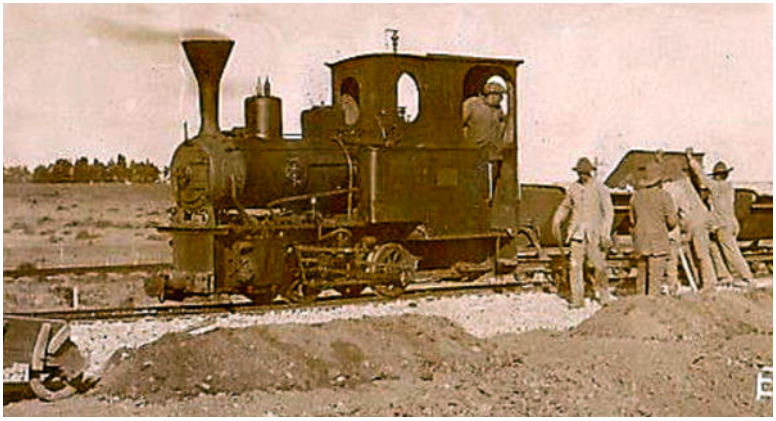
On the left is an O&K 0-4-0T, whilst that on the right is by Henschel.

Construction of the Centenario stadium in 1930

The following photo appeared in a magazine *Medio Siglo del Estadio Centenario* produced in 1980. The image was passed to the *Ferrocarriles Uruguayos (A.T.U.)* group on Facebook by courtesy of José Enriquez and Mathias de Souza. The Centenario stadium is located in the Parque José Batlle y Ordoñez in eastern Montevideo.



The engine is clearly an O&K 0-4-0T almost certainly on 60cm gauge track. However, its identity has not been discovered and nor has the significance of the inscription on the cabside.



9.6.12 Other quarries and sandpits

Arenera Willat y Cía at Villa 25 de Agosto, Florida

Background

This sand quarry opened in 1914. The town of Villa 25 de Agosto is just north of Santa Lucía on the CUR mainline. The operator from 1914 to 1929 was the Empresa Willat y Cía.

These three images come from a short video at
https://www.youtube.com/watch?v=PcpgUQqZL_k

Cantera Parada Sur

Background

This was on the south bank of the Río Negro about 3 km south of Paso de los Toros. It had been use as a ballast quarry by the railway for many years but in the 1930s it gained its own 60 cm gauge rail system.

0-4-0T d/w ?, cyls. ?, Built by O&K in 1906

LVD 1	w/n 2029	The initials LVD stand for 'Locomotora de Vía Decauville' Converted to oil firing in the 1970s, and with a fuel tank mounted above the boiler. The loco is now preserved by *CEFU* at Peñarol.

The Canelones sandpits

Background

Fabián Iglesias, in source [25] tells of four sand quarries in the vicinity of Canelones which supplied sand not least to the CUR for loco use. These were apparently in the following locations:

1 South of Santa Lucia station, known as El Rincón.

2 North of Santa Lucia station, known as Paso del Soldado.

3 and 4 in town of 25 de Agosto.

Sr. Iglesias states that they used diesel locos, but given that they were in operation from the 1920s or earlier presumably steam might have been used originally.

Cantera Isla San Gabriel

Background

The presence of stone suitable for construction purposes had been known about since before the last quarter of the nineteenth century. The development port of La Plata required the supply of stone which could in part be met from here and in 1883 when the first map of the island was produced it showed two quarries linked to a muelle by railway lines. It is not known what form of traction was used. A personal account of of the quarries in the late 1930s suggested that two wagons operated on the railway, but from the views dating from 1931, by which time a reinforced concrete muelle had been provided, would suggest that what had been meant was two locomotives.

Cantera Oroná at Colonia

Background

In the reference noted, it was recorded that there was a sand quarry on land belonging to the Oroná family. The prime market was Buenos Aires and it was recorded that in the 1920s it was equipped with a modern Decauville system; presumably this also connected the quarry to a *muelle* in Colonia. The site of the quarry has not been established.

Cantera del Cerro Carmelo

Background

Cerro Carmelo is an outcrop of granite at Puerto Las Vacas which was worked for the production of paving setts, mainly for the Buenos Aires market. The owners were O'Connor and Pons. In 1895 the river Vacas was dredged to its

nearest point to the quarry, and a *muelle* built to allow gabbards to load. Eventually in 1912, a manually operated swing bridge was provided on the road leading in to Carmello where it crossed the river. It is not know if steam locomotives ever operated there.

Antonio Ferro e Hijos

Background

60 cm gauge. This was an Argentine company, but the locomotives were used for sand extraction in Uruguay. Location unknown. The owners also extracted salt at the Salina Grande on the Peninsula Valdes in Patagonia.

0-4-0T d/w ?, cyls. ?, built by O&K in 1904 and 1906

?	w/n 1351	20hp	
?	w/n 1923	20hp	This loco later moved to Indare SA, see above, where it became no. **4**.
?	w/n 1924	20hp	

Arenera del Norte at Punta Dorada in Colonia

Background

60 cm gauge? Little is known of this location, but an O&K tank loco survives, supposedly "at the entrance to Nueva Helvética on Ruta 1".

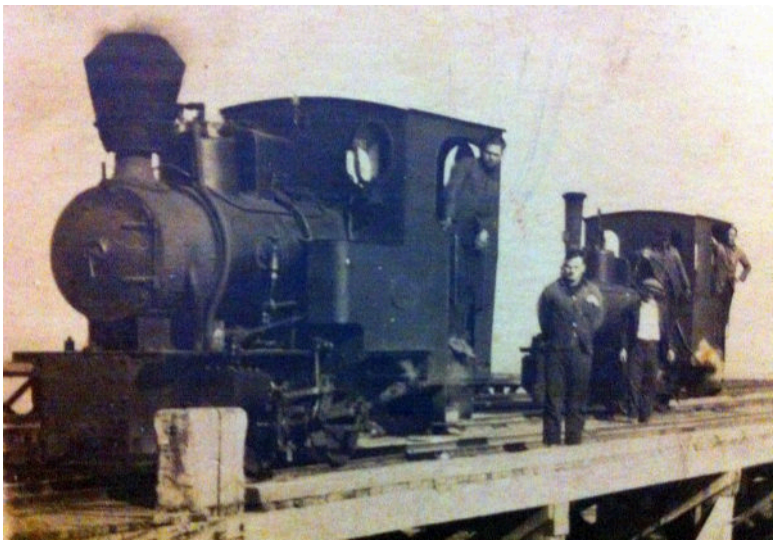
0-4-0T d/w ?, cyls. ?, built by O&K in 19??

?	w/n ?	??hp

One of three images posted to the Orenstein & Koppel (OP&K) Steam Locomotives page on Facebook by Sr. Joselo Damico.

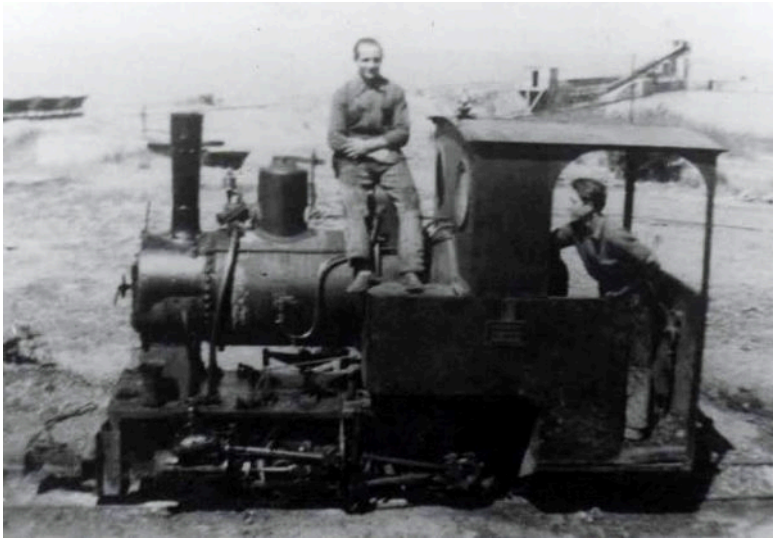
Unidentified sand quarry locos

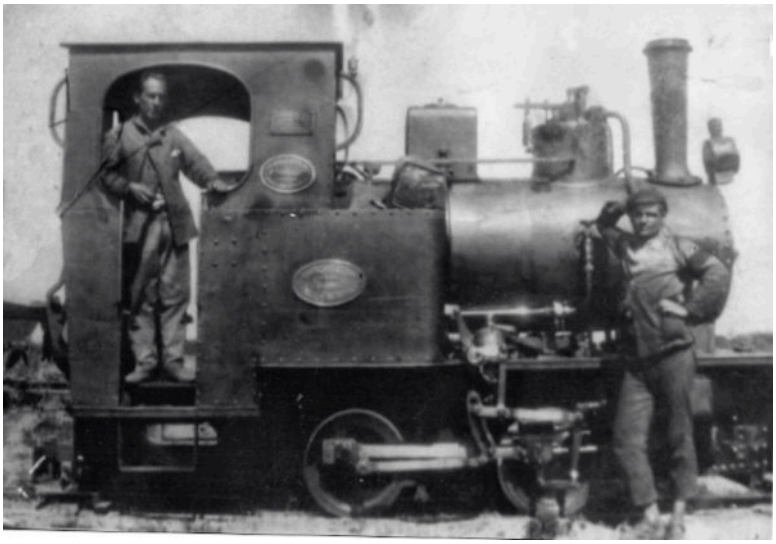
The following photos show a numbers of narrow gauge engines working at Uruguayan sandpits or on jetties. None of these have yet been pinned down to a specific location, though clearly in some cases they could have been taken at one of the sites mentioned above.



The right hand loco is an O&K whilst the left hand one is probably a Henschel.

These two pics seem to show Krauss 0-4-0Ts at coastal sites. The locos differ in their buffer beams and in other details.





A small Henschel, probably readily identifiable by having three plates on the cab and bunker sides.

9.6.13 Leibigs Extract of Meat Ltd. at Fray Bentos

Background

Standard gauge. This was the main meat processing plant at Villa Indepencia, later called Fray Bentos. The location was initially developed to produce Liebig's Extract of Meat, only later diversifying into the production of Fray Bentos corned beef The Chaplin loco mentioned below seems to have been sent out for the duration of the building work but then to have been returned to the UK. The sole source of information so far is an article on Chaplin locos in *The Industrial Locomotive* issue no. 53.

0-4-0VBT d/w ?, cyls. ?, built by Alexander Chaplin & Co. in 1860s?

Ordered by ?

?	w/n 708	By 1870 returned to UK and being used by Oswald & Co, shipbuilders, of Pallion, Sunderland, and then by 1874 was at Kilsyth Coal Co.

9.6.14 James Perry & Co.
during construction of the Uruguay Northern Railway

Background

Metre gauge. James Perry & Co. wewre contractors for the building of the Uruguay Northern Railway.

0-6-0ST d/w 42", cyls. 12x20", built by Black Hawthorn in 1888

Ordered for James Perry & Co.

?	w/n 959	Then sold to Medici y Cía. for the Puerto del Sauce to Cantera Minuano sand railway, See section 9.3.1.

9.7 Unidentified locos

Henschel

0-4-0T	"	19254	1922	600mm	For Uruguay
0-4-0T	"	19255	1922	600mm	For Uruguay
0-4-0T	"	19256	1922	600mm	For Uruguay

Kerr Stuart

0-4-0ST d/w ? cyls. 6x9" Wren class 2' 0" gauge. Supplied to or via Wilson Sons & Co. Ltd., Montevideo.
4294
4295

Kitson

2668-73 1884 Std. 4-4-0 d/w 6'0" inside cyls. 17½x26" Great North of Scotland Railway, **63-68**
Supposedly built originally for Uruguay, but this is not certain.

Manning Wardle

956 1886 0-6-0ST Standard gauge For Lucas Gonzales y Cía, Concepción del Uruguay.

O&K

0-4-0T	O & K	2029	1906	20	600mm	To Uruguay
5831	1912	20 PS	Bt	600	12.1912	Lager Montevideo
10973	1925		Bt	600		Lager Montevideo
11012	1925		Bt	600		Ernesto Quincke, Montevideo
11100	1926		Bt	600		Lager Montevideo
11339	1927		Bt	600		Lager Montevideo
11416	1927	Ersatzkessel				Cia Materiales de Construc, Montevideo

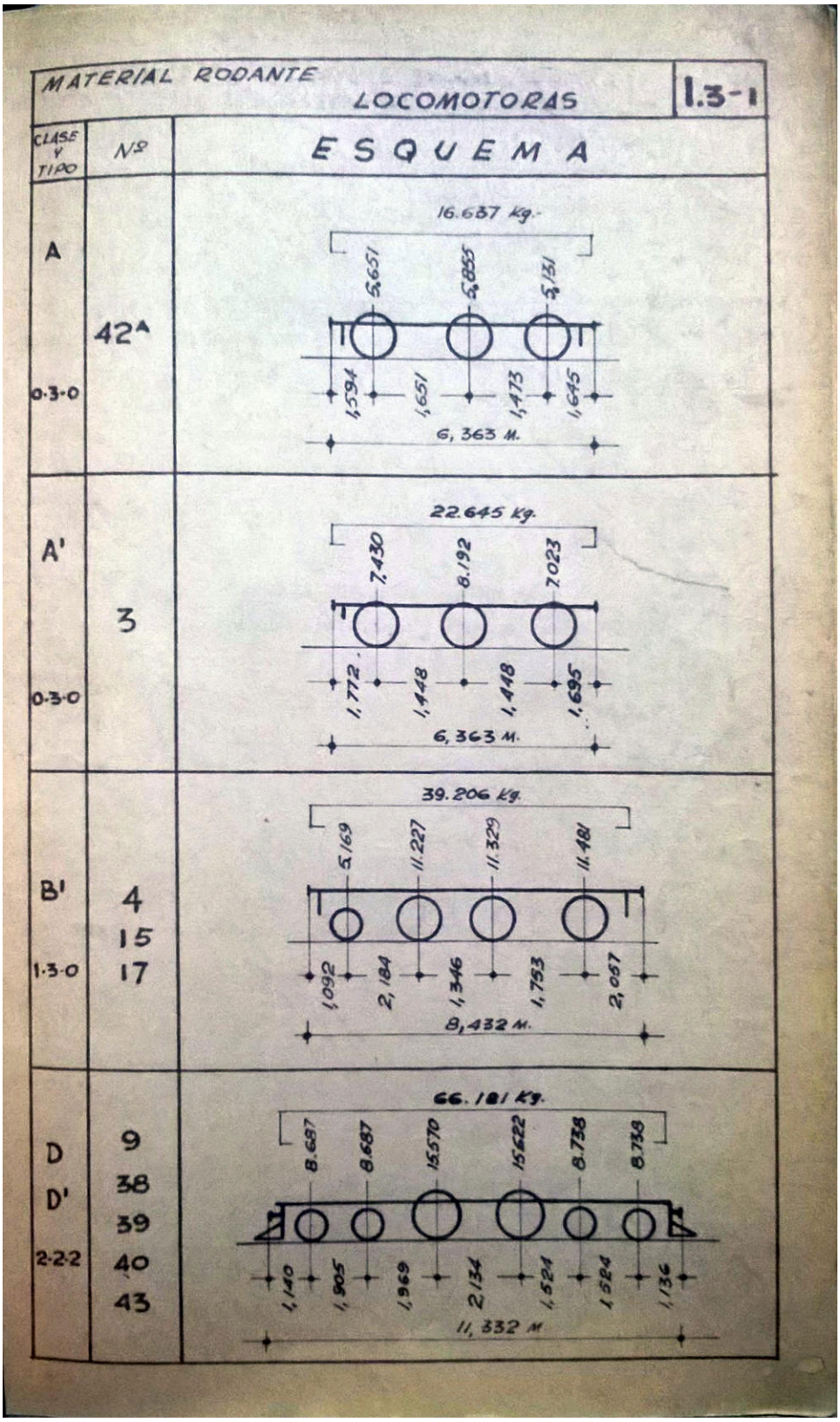
0-4-0T O&K 1925 ex Northern Sand Quarry at route 1 near junction to Nueva Helvecia, said to be in poor condition in early 2005:

A.U.A.R. also owns a narrow gauge (600mm) 0-8-0T 2 (Henschel, 1928, former *Compañia Nacional de cemento* railway). This loco will be used in a tourist railway in the west of Montevideo.

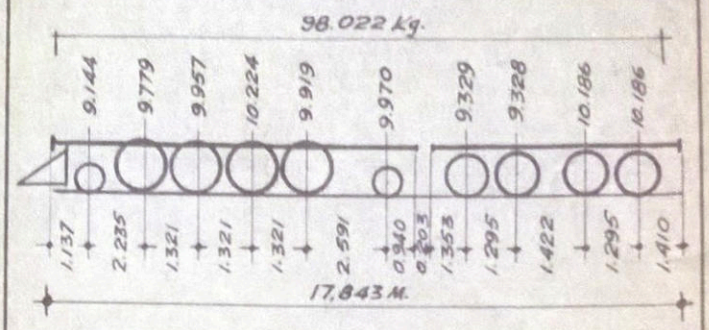
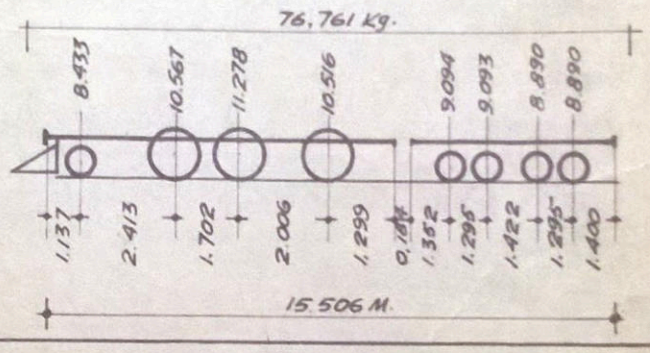
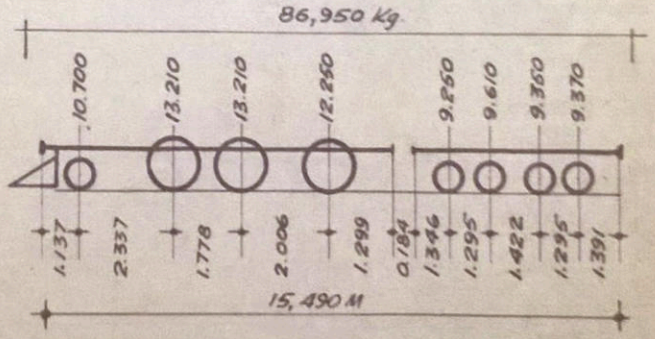
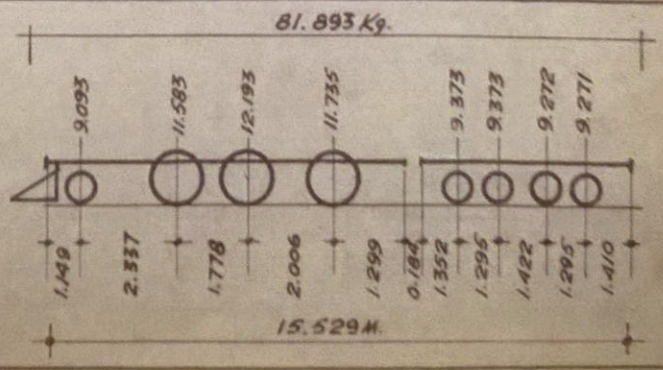
9.8 Appendices

9.8.1 *AFE* diagram sheets

Railway diagram sheets are intended to give basic information about the dimensions and weights of locos and rolling stock to anyone who might need such details. As such the drawings displayed are often of a fairly basic quality. The *AFE*'s diagram sheets shown here take this to a whole new level, however, showing only the wheel arrangement, lengths and axle loadings.



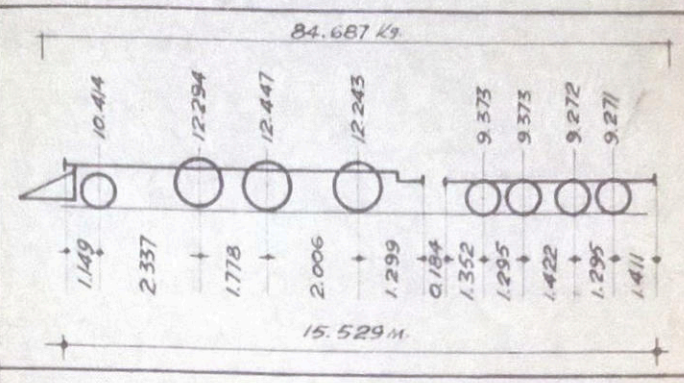
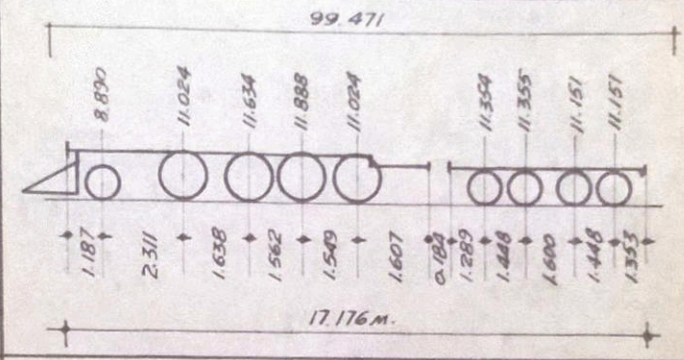
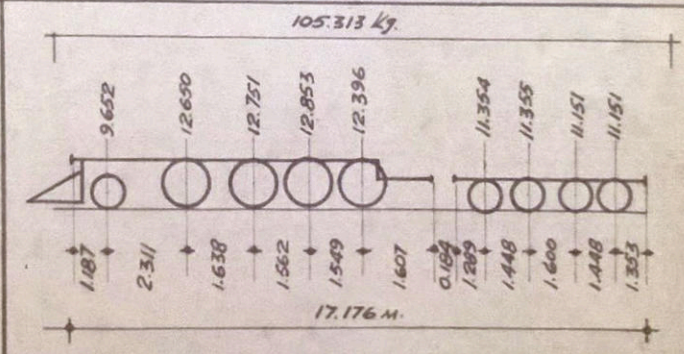
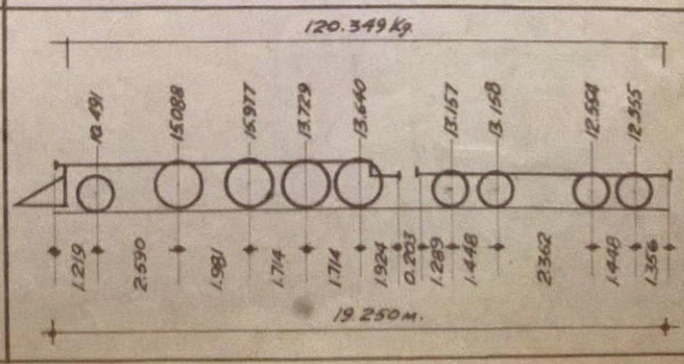
MATERIAL RODANTE — LOCOMOTORAS — 1.3-2

CLASE Y TIPO	Nº	ESQUEMA
H' 1-4-1	22 Y 24	
L 1-3-0	64 65 67 72 76	
1-3-0	222 AL 227	
Ns 1-3-0	88 AL 108	

MATERIAL RODANTE

LOCOMOTORAS

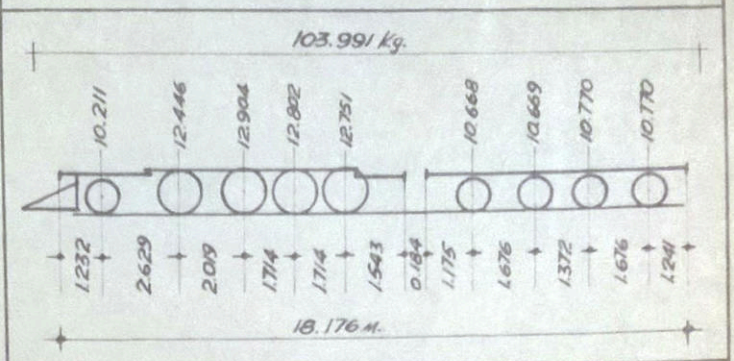
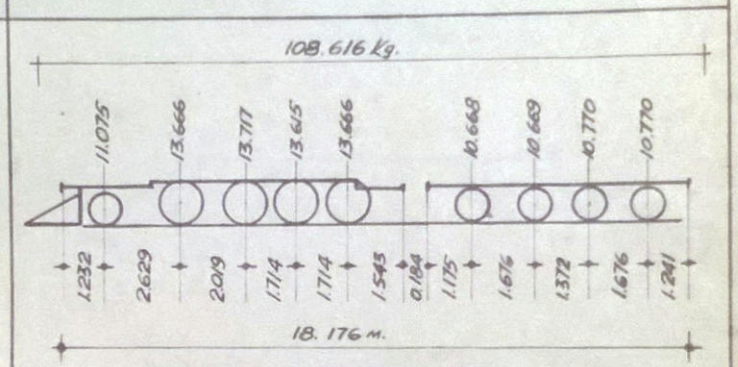
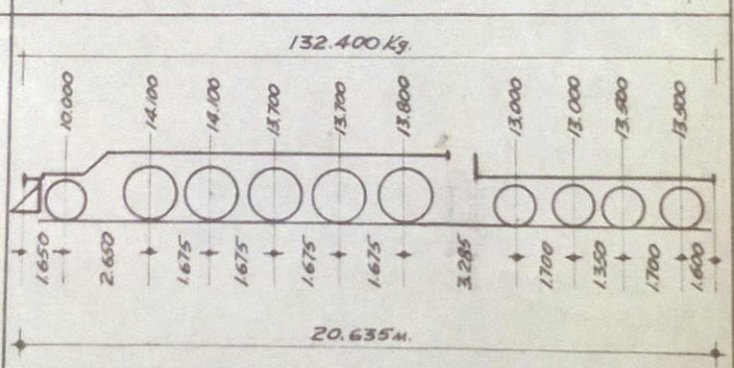
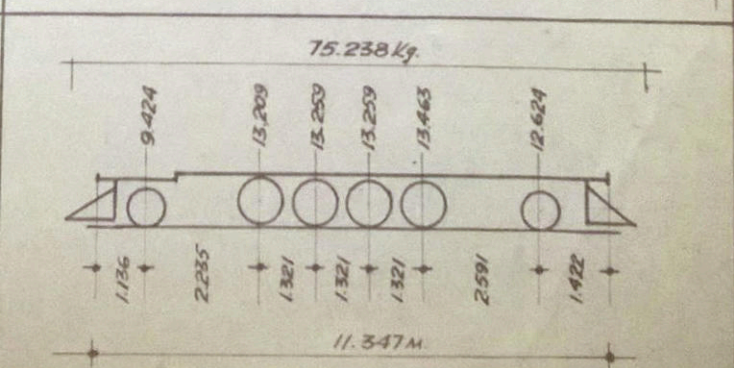
1.3-3

CLASE Y TIPO	Nº	ESQUEMA
N^2 1-3-0	118 Y 121	
N^3 1-3-0	115 116 117 119 120 122	
R^1 1-4-0	112 113 114 123 124 125	
R^2 1-4-0	126 AL 131	
R^4 1-4-0	109 110 111	
S 1-4-0	142 AL 151	

MATERIAL RODANTE

LOCOMOTORAS

1.3-4

CLASE Y TIPO	Nº	ESQUEMA
T 1-4-0	132 AL 139	
T' 1-4-0	140 Y 141	
V 1-5-0	156 AL 160	
W 1-4-1	23	

9.8.2 The 1893 CUR fleet list

This list was published in source [32], *Treatise on the South American railways and the great international lines*, Castro Juan José, 1893, *Ministerio de Fomento*.

— 116 — — 117 —

Central Uruguay and Allied Railway Cos.

LIST OF LOCOMOTIVES.

CLASS.	No.	MAKERS' No.	DESCRIPTION.	CYLINDERS. DIAMETER. Ft.	ins.	STROKE. Ft.	ins.	DIAMETER OF WHEELS. Ft.	ins.	WEIGHT. ENGINE. Tons.	cwt.	qrs.	lbs.	TENDER. Tons.	cwt.	qrs.	lbs.	TOTAL. Tons.	cwt.	qrs.	lbs.	PROPRIETORS.	MAKERS.	DATE.
A	1	235	6 wheel coupled, saddle tank.	"	11	1	6	3	6													C. U. Railway Co.	Manning, Wardle & Co.	1867
"	2	300	" "	"	"	"	"	"	"													"	" " "	1870
"	42	1045	" "	"	"	"	"	"	"													North Eastern.	" " "	1888
"	43	1148	" "	"	"	"	"	"	"													Northern Extension.	" " "	1869
"	44	1149	" "	"	"	"	"	"	"													" "	" " "	"
B	3	245	6 wheel coupled, 6 wheel tender.	1	4	1	10	4	6													C. U. Railway Co.	" " "	1868
"	4	251	" "	"	"	"	"	"	"													"	" " "	"
C	47	2705	4 wheel coupled, compound passenger, 4 wheel bogie, & bogie tender.	Ft ins & Ft ins 1 11 " 1 4		5	10	5	0	37	13	2	8	27	19	3	20	65	13	2	0	"	R. Stephenson & Co.	1891
"	48	2706	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	49	2707	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	Eastern Extension.	" "	"
"	50	2708	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" "	"
"	51	2709	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" "	"
"	52	2710	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" "	"
"	57	3295	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	C. U. Railway Co.	Beyer Peacock & Co.	"
"	58	3296	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" " "	"
"	59	3297	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" " "	"
"	60	3298	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" " "	"
"	61	3299	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" " "	"
"	62	3300	" "	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	" "	" " "	"
D1	6	1081	4 wheel coupled, 4 wheel bogie, 6 wheel tender.	Ft 1	ins " 2	1	" 8	5	" 7½													" "	R. Stephenson & Co.	1867
"	7	1082	" "	"	"	"	"	"	"													" "	" " "	1870
D2	38	630	4 wheel coupled, 4 wheel bogie, bogie tender.	1	" 2	2	" 0	5	" 3													" "	Taunton Mfg. Co.	1873
"	39		" "	"	"	"	"	"	"													" "	" " "	"
"	40	629	" "	"	"	"	"	"	"													" "	" " "	"
"	41		" "	"	"	"	"	"	"													" "	" " "	"
E1	5	1919	6 wheel, 4 wheel coupled, 4 wheel tender.	1	" 3	1	" 8	5	" 0													" "	Sharp, Stewart & Co.	1869
E2	8	675	" "	1	" 2	1	" 10	4	" 6													North Eastern.	Vulcan Foundry Co.	1873
"	9	673	" "	"	"	"	"	"	"													C. U. Railway Co.	" " "	"
"	10	674	" "	"	"	"	"	"	"													" "	" " "	"
"	11	677	" "	"	"	"	"	"	"													" "	" " "	"
"	12	676	" "	"	"	"	"	"	"													" "	" " "	"
"	13	635	" "	"	"	"	"	"	"													" "	" " "	"
"	14	681	" "	"	"	"	"	"	"													" "	" " "	"
F	17	1424	" "	"	"	"	"	"	"													" "	Beyer Peacock & Co.	1874
"	18	1425	" "	"	"	"	"	"	"													" "	" " "	"

CLASS.	No.	MAKERS' No.	DESCRIPTION.	CYLINDERS. DIAMETER. Ft.	CYLINDERS. DIAMETER. ins.	CYLINDERS. STROKE. Ft.	CYLINDERS. STROKE. ins.	DIAMETER OF WHEELS. Ft.	DIAMETER OF WHEELS. ins.	WEIGHT. ENGINE. Tons.	ENGINE. cwt.	ENGINE. qrs.	ENGINE. lbs.	TENDER. Tons.	TENDER. cwt.	TENDER. qrs.	TENDER. lbs.	TOTAL. Tons.	TOTAL. cwt.	TOTAL. qrs.	TOTAL. lbs.	PROPRIETORS.	MAKERS.	DATE.
G1	19	2111	6 wheel coupled, 2 wheel "Bissel" bogie, 6 wheel tender.	1	"	41½	2	"	0	4	"	6										" " "	" "	1881
"	20	2112	" "	"	"	"	"	"	"	"	"	"										" " "	" "	"
"	21	2113	" "	"	"	"	"	"	"	"	"	"										" " "	" "	"
"	25	2966	" "	"	"	"	"	"	"	"	"	"										" " "	" "	1888
"	26	2967	" "	"	"	"	"	"	"	"	"	"										" " "	" "	"
"	28	3030	" "	"	"	"	"	"	"	"	"	"										Northern Extension.	" "	1889
"	29	3031	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
"	30	3032	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
"	34	2916	" "	"	"	"	"	"	"	"	"	"										North Eastern	" "	1887
"	35	2917	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
"	36	2918	" "	"	"	"	"	"	"	"	"	"										" "	" "	1888
"	37	2943	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
G2	27	2998	6 wheel coupled, compound, 2 wheel "Bissel" bogie 6 wheel tender.	Ft ins. 2	1 &	Ft ins. 1	5	"	"	"	"	"										C. U. Railway Co.	" "	1889
"	31	3033	" "	"	"	"	"	"	"	"	"	"										Northern Extension	" "	"
"	32	3034	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
"	33	3035	" "	"	"	"	"	"	"	"	"	"										" "	" "	"
G3	53	2701	6 wheel coupled, compound 2 wheel bogie, & bogie tender.	"	"	"	"	"	"	"	"	"												
"	54	2702	" "	"	"	"	"	"	"	"	"	"												
"	55	2703	" "	"	"	"	"	"	"	"	"	"												
"	56	2704	" "	"	"	"	"	"	"	"	"	"												
H	22	2512	8 wheel coupled, 2 wheel "Bissel" bogie, 6 wheel tender.	Ft. 1	"	ins. 6	2	"	0	3	"	10												
"	23	2513	" "	"	"	"	"	"	"	"	"	"												
"	24	2514	" "	"	"	"	"	"	"	"	"	"												
Y	15	594	4 wheel coupled, 4 wheel bogie, & bogie tender.	1	"	0	2	"	0	4	"	6												
"	16	592	" "	"	"	"	"	"	"	"	"	"										North Eastern	Taunton Mfg. Co.	1873
K	45	2711	6 wheel coupled, saddle tank.	1	2	2	1	"	8	4	"	0												
"	46	2712	" "	"	"	"	"	"	"	"	"	"						30	7	0	16	C. U. Railway Co.	Stephenson & Co.	1891
													38	16	6	4	27	19	3	20	66	Eastern Extension.	Stephenson & Co.	1691
													"	"	"	"	"	"	"	"	"			
													"	"	"	"	"	"	"	"	"			
													7	"	"	"	"	"	"	"	"			
													41	"	"	25	25	"	"	66	66	C. C. Railway Co.	Beyer Peacock & Co.	1884
													"	"	"	"	"	"	"	"	"			
													"	"	"	"	"	"	"	"	"			

Central Uruguay Railway.

DESCRIPTIVE TABLE OF THE LOCOMOTIVES, GIVING THE MAXIMUM SPEED ALLOWED ON THE INCLINES AND THE MAXIMUM LOAD ALLOWED FOR EACH CLASS WITH THE DIFFERENT CLASSES OF TRAINS.

		A.	B.	C.	D.		E.		F.	G.		H.	I.	K.
				(Compound).						(Simple.)	(Compound)			
Number of each class. .	...	5	2	12	6		8		2	20		2	2	2
Numeration of the engines of each class	...	1 and 2	3 and 4	47 and 52	6 and 7	38 to 41	5	8 to 14	17 and 18	19 to 21 25 to 26 28 to 30 34 to 37	27 31 to 33 53 to 56	22 to 24	15 and 16	45 and 46
		42 to 44	...	57 to 62	...	...	...	...	...			...	...	...
Number of coupled wheels.	...	6	6	4	4	4	4	4	4	6	6	8	4	6
Diameter of do	inches.	40	54	60	67 1/2	63	60	54	54	54	54	46	54	48
" " cylinders . .	"	11	16	16 and 22	14	14	15	14	14	16 1/2	17 and 25	18	12	14
Stroke of pistons	"	18	22	22	20	24	18	20	20	24	24	24	24	20
Highest pressure allowed.	(pounds.)	120	120	170	120	120	120	120	120	160	170	160	120	150
Maximum speed allowed on inclines	milles.	...	30	45	40	40	35	35	35	30	30	25	40	...
Maximum load allowed including weight of wagons.	(tons.)	...	280	250	180	180	220	220	200	350	350	450	180	...
Number of cattle wagons plus 2 brakes and wagons for horses (without cutting).	...	...	12	10	8	8	9	9	9	15	15	20	8	...
Do. do. (cutting the train on steep inclines) . . .	...	...	15	13	9	9	11	11	11	18	18	24	9	...
Goods trains (without cutting) N.° of vehicles allowed.	...	...	28	23	18	18	22	22	20	35	35	45	18	...
Mixed trains (heavy) coaches and brakes . .	...	...	5	5	5	5	5	5	5	5	5	...	5	...
Do. do. do. wagons . . .	...	...	20	18	6	6	12	12	10	25	25	...	6	...
Do. do. (light) coaches and brakes	...	...	...	7	7	7	7	7	7	7	7	...	7	...
Do. do. do. wagons . . .	...	...	. .	10	3	3	6	6	5	16	16	...	3	...
Cattle wagons allowed with mixed trains. . .	...	...	8	7	3	3	5	5	5	11	11	...	3	...
Passenger trains only . .	...	...	According to time table special orders.				...	...	...	...	...	...	...	...

9.8.3 AFE Manual of steam locomotives for drivers and firemen

The original Spanish text of the *AFE* steam locomotive manual is available via the Facebook page *Ferrocarriles Uruguayanos (A.T.U.*). Go to their files page where you can download the file entitled AFE - Manual para Locomotoras a Vapor (Para Maquinistas y Foguistas).docx The following direct link might work: https://www.facebook.com/groups/1439339249643202/permalink/2731722517071529 Whilst there is no specific publication date mentioned, there is a reference to the class V locomotives being new, ie. in the early 1950s, and to the locomotives of the Central Uruguay Railway which suggests that an earlier version of the text might have originated from that source.

A rough English auto-translation of the text follows. Note that the diagrams referred to in the text have not be seen, and thus some of the more technical sections, such as that describing the action of types of valvegear, has not been compared to those diagrams and may therefore be incorrect at present, This appendix is in the process of preparation and translation.

A F E
STEAM LOCOMOTIVE MANUAL
FOR DRIVERS AND FIREMEN

First descriptive part

The locomotive. - The steam locomotive consists of a frame on which the boiler is mounted and to which all the locomotion mechanism, cylinders, wheels and movement is secured. See plate No. 01 and references.
The boiler or steam generator consists of a barrel or cylindrical body, a firebox and a smokebox. The barrel contains a series of tubes secured between the tubular plates of the fire and smokeboxes through which the combustion gases pass from the first to the second and from there through the chimney to the outside air.
All this material is generally mild steel.
The firebox is a (rectangular?) hearth where the fuel is burned, it consists of a front plate, a rear plate and a roof plate called *cielo de hogar* (the wrapper). The construction is such that when the boiler has its proper water level, all the plates, even the roof, are covered by this liquid. In coal-fired machines, the floor is made up of a set of bars that make up the grate, and in oil machines, by a floor of refractory bricks that are part of the ashpan.
Likewise, the tubes are surrounded by water throughout their circumference.
The smoke box is the front space*, of the boiler, where by appropriate means a vacuum is created that (draws) gas from the firebox, then passing through the chimney to the outside.
During normal operation, the surfaces of the firebox and interior of the boiler tubes absorb the heat of the gases and then the water that is in contact with the other side of the sheets and tubes is heated by evaporating and transforming into steam. that accumulates within the top of the barrel. The steam is used to drive the machine through the cylinders, extracting it from the highest part of the barrel, that is, what is called the dome.

Boiler accessories. – The boiler is equipped with the following accessories:
1st Injectors
2nd Safety valves
3rd Regulator valves
4th *Cano horizontal* (dry pipe)
5th Superheater
6th Level glass
7th Steam pressure gauge

8th Fusible plugs.

Injectors -–The common injector placed below the level of the water that supplies it and illustrated in sheet N ° 2 is made up of a body that has two inlets and two outlets, that is, cold water inlet, boiler steam inlet, cold water drain and hot water outlet or introduction to the boiler.
Inside the injector body there is a fixed vapor cone, a fixed mixing cone, a convergent movable cone, and a divergent fixed cone.
When opening the water handle of the tender, the water enters the convergent mobile cone, moving it forward and draining through the cold water outlet pipe.
Here the steam valve is slowly opened, allowing it to enter through the steam cone and colliding with the water in the mixing cone, yielding much of its temperature and energy and giving it great speed in the movable convergent cone to pass through the divergent cone where the speed decreases and the pressure increases, which makes it possible to introduce it into the boiler.
There are types of lifting injectors that are placed at the height of the driver and at a higher water level than the water of the tender. In these types, an extra cone is inserted which, when producing a vacuum in the water pipe, makes it lift (the water) to the body of the injector from where it follows the same course as in the case of the common or primitive injector.
Regulator valve – It is the isolation valve between the boiler and the driving mechanism of the cylinders. It can be placed in the dome, at the end of the so-called horizontal pipe or in the smoke box at the outlet of the steam superheater. Its actuation is generally carried out through a bar which in the first case is inside the boiler and in the second case outside which ends in the regulator lever actuated by the driver.
Regulator valves can be flat, cylindrical, or multiple, (balanced) or not.
Safety valves – Their elements generally are loaded by means of springs that allow them to be adjusted appropriately and that actuate when the vapor pressure rising above the normal pressure overcomes the mentioned springs, then finding a free outlet to the outside and eliminating the possibility of an explosion by normal evaporation.
***Cano horizontal* (the dry pipe)** – It is a pipe inside the boiler that communicates the steam space in the dome with the collector and that in the case of a regulator valve in the dome is subjected to the steam pressure on the outer wall when the regulator is closed.
The superheater – It consists of a collector that receives common or saturated steam from the boiler through the horizontal (dry) pipe and directs it towards the reheater elements, where the temperature of the same, at the pressure of the boiler, is high, eliminating moisture and water particles that could drag, and receives it again reheated to finally send it to. the regulator valve.
Level glass – There are two of these placed on the front of the boiler that show the water level in the boiler at any time and indicate to the crew when they must introduce water into the boiler.
Steam pressure gauge – Indicates the pressure at all times of the steam in the boiler and is marked with a coloured line (showing) the maximum pressure to be used and at which the safety valves discharge.
The loco crew must always be attentive so that the pressure is kept almost to the maximum allowed, but without allowing the safety valve to open.
Fusible plugs – They are screwed steel caps in the (firebox) roof and filled with lead that melts when the boiler lacks water, and causes the steam to put out the fire.
Types of locomotives – There are tank and tender.
The tank is called- thus, the fuel and water tank is placed on the frame of the machine and forms a fixed part of it.
The tender machines are provided with a separate tender which contains the water and fuel tanks and which is coupled to the machine by means of a drawbar.
Both the tank and tender machines have coupled and pony or bogie wheel sets depending on their power, weight and use.

The choice of type depends among others on the following factors:
1st Services.
2nd Distances between water and oil reservoir.
3rd The permitted axle-loads.

Characteristics of the road.
For service where it is not convenient to be stopping often to get water and in those points where good water is distant from each other, the tender machine is used due to its water capacity. Also when the engine (is at the maximum possible weight?) it is not possible to add the weight of water and fuel on its frame and axles. In the case of very small machines, tank machines are necessary to increase the weight on the driving wheels and thus obtain a satisfactory adhesion on the wheels.
The frame – It is the "chassis" or resistant structure of the locomotive. In our case, it is generally made up of two mild steel sheets suitably reinforced by transverse stays on which the boiler rests and to which the valve and cylinder mechanisms are attached. The boxes that rest on the axles of the wheels in the case of drive wheels and that support the entire weight of the locomotive are attached to the frame by springs and spring hangers.
There are ‘bar’ frames which are generally cast in steel in one piece.
The new (class) V machines have a bar frame.
Valves and pistons – The valve is the mechanism that, activated by the valve gear movement, distributes the steam from the boiler to the cylinders.
The pistons work driven by steam inside the cylinders and transmit the movement to the crosshead and from there through the connecting rods to the driving wheels.
There are two types of valves generally in use:
1st Slide valves
2nd Piston valves
The flat valves work on a (polished surface) with the ports and are held in place by means of springs and is so generally offset. It is actuated by an (eccentric?) that is part of the valve gear.
In cylindrical valves the orifices are arranged around the circumference of a small cylinder (called the sleeve) and the valve consists of two pistons fixed to each other with rings and actuated by the valve handle. The valve handle that operates the valves, both in the case of flat valves, and in that of cylindrical ones, it is in turn actuated and controlled by the valve gear.
Valve gear – The most common are the Walschaert type and the Stephenson type.
The valve gear allows the distribution of steam to be controlled according to the needs of the service, already regulating the entry of steam to the cylinders according to the characteristics of the service, and allowing you to move forward as well as in reverse.
Lubrication – The lubrication of the valves and cylinders is carried out by means of displacement lubricators or hydrostatic lubricators or positive injection lubricators.
The hydrostatic lubricator. Just as a cork immersed in water tends to rise to the surface and exerts a pressure against an object that prevents it, in the same way, in hydrostatic lubricators the drops of oil are driven by the difference in weight with the water to be introduced into the lubrication pipes. In these cases there is also another driving force, which is the difference in steam pressure in the boiler and in the valve box.
Its construction allows the number of drops per minute that is being distributed to be visible to the crew.
The shutter valve is located at the lubrication discharge point, which serves so that the oil distribution is constant with the regulator open or regulator closed.
The most common types of sight lubricators are the Detroit and the Wakefield.
The mechanical lubricator – It distributes the oil by means of pumps activated by a lever mechanism. This type of lubricator is used to distribute the oil both to the valves and pistons and to the axes of the machine.
In the case of mechanical lubrication for the valves and pistons, the pipes are provided with anti-carbonizing

devices that emulsify the oil with steam and water, facilitating its dispersion in the steam pipe and its dragging by the same steam towards the valve box. .
The most common types of mechanical lubricators are Wakefield and Peñarol.
Brakes – There are three main classes of brakes:
1st) The handbrake that consists of a simple shaft actuated by hand by means of a handle or flywheel and that by means of a system of screws, chains, gears, or a combination of the three, actuates on the rims of the wheels and with their friction it manages to reduce the speed of the vehicle until it stops.
2nd) In the same way as the handbrake, there are automatic vacuum brake systems, air pressure brake and steam brakes.
On the Uruguayan railways the locomotives are equipped with hand brakes, automatic vacuum brake for the engine and the train, and a shunting brake (*macaco*).

Second part

Technical

The locomotive – The design and power of the locomotives are subject to:
1st) The type of service they will perform.
2nd) The characteristics and condition of the road.
Among other things, the speed of the trains that will have to run and the gross weight of the trains must be taken into account, as well as the steepness of the hills that the train will have to climb in its run, and their length.
Knowing the maximum tractive force necessary, knowing the chosen boiler pressure and the diameter of the chosen driving wheels, it is possible to determine the diameter and stroke of the cylinders to achieve that tractive force.
To decide the diameter of the wheels, on the other hand, the speeds to be developed must be taken into account in order not to exceed the maximum speed of a given revolution, while keeping the speed of the piston in the cylinders within adequate values.
In order to obtain the necessary tractive effort, it must be taken into account to have a certain weight on the drive wheels, which, if insufficient, would cause the machine to slip. This adhesive weight could theoretically be placed on a single axle, but at this point it is necessary to take into account the road conditions that do not allow loading an axle with more than a certain weight, which in our case and for steam engines it does not exceed 15,500kg per axle. These latter circumstances make it necessary to distribute this adherent weight over a greater number of axles, arriving at machines with 3, 4 and 5 coupled axles, as in our case the machines recently acquired will do.
Next, I give the main data of three types of machines of the Central Uruguay Railway.
Class S – A type of three-cylinder machine for passenger trains up to 80 kph, and goodscargo, agricultural and mixed trains up to 60 kph, with a weight of 230 tons for passengers, and around 600 tons for freight. .
The 5' diameter of the wheels allows it to develop a speed of 80 k.p.h., without difficulty.
Class R 1 and 2 – With two cylinders for heavy freight trains of no more than 50 kph, and with about 500 tons of train.
The diameter of the wheel 4 '6" does not allow it to develop higher speeds satisfactorily since the revolutions per minute would be too high.
Class D – Two-cylinder for light local trains with maximum speeds of 80 kph, and 80 tons of weight.
The diameter of the wheels with very light trains, allows you to accelerate comfortably and its weight of adhesion on the drive wheels and coupling is enough to prevent slipping.

Details

(Loco class)	S	R.2	D
Tractive effort in pounds	30,460	22984	

13930				
Adhesive weight in kilos	57,500		44,500	
30,550				
Number and diameter of cylinders and stroke in inches		(3) 175x26	(2) 19x24	(2)
16 x24				
Pressure of the boiler in pounds		180	160	160
Driving wheel diameter.	5' 0"	4' 6"	5' 0"	
Total weight of the machine without tender, in kgs.	67,800		53,000	
65.000				
Maximum weight per axle in kgs.	15,700		11,700	
15,250				

Tractive effort – Knowing on the other hand the diameter of the cylinders, their stroke or piston course, the pressure of the boiler and the diameter of the driving wheels, it is possible by applying a simple formula, to calculate approximately the maximum tractive effort that a machine is capable of. to develop. This formula is for a 2 cylinder machine.

$$\frac{d^2 x P x S}{D} = \text{Tractive effort in pounds.}$$

Where d^2 is the square of the cylinder diameter measured in inches,
D the diameter of the driving wheels in inches,
S the stroke of the piston in inches or in other words double the radius of the crank pins and finally P a pressure in pounds per square inch.

If the entry of steam into the cylinders occurred during the entire stroke of the piston and if there were no pressure losses between the boiler and the valve box, that pressure P would be the boiler pressure indicated by the manometer, but since this is not the case, it has been agreed to take 85 percent of the boiler pressure as the pressure P to take into account the losses.

The same formula gives the tractive effort in motion, but the pressure P must then be the effective mean version throughout the piston stroke.

Knowing then the tractive forces that the machine is capable of at different speeds and taking into account the different resistance accumulated by friction, slopes, curves and acceleration of the trains, it is possible to draw up the tables of speeds and drag tonnages that allow the different duties to be subsequently prepared.

Water condition – The water level in the boiler must always be in the middle of the glass and it is necessary to work the fire accordingly.

If the level is too high there will be a danger of causing a rise or falling of water which, instead of superheated dry steam will be saturated at the cylinders, or even water, which would cause a large loss of power causing in serious and serious cases damages and breaking of valves and pistons and loosening of the piston rod or its twisting.

Also a small rise of water can bring as a consequence an involuntary application of the brake by losing efficiency of the vacuum ejector, which is designed to work with dry steam.

It may happen that due to impurities in the water or its hard location there is a tendency to rise even with the indicated level. For this purpose the quality of the water is constantly monitored. and its density is controlled so that it does not pass a maximum of 1%, that is, it does not contain suspended solids in greater quantity than 10 grams per litre (1000 gm.)

Boiler blowdowns specifically try to expel as much suspended solids and semi-settled sludge as possible. For this reason, it is important that they are not long, but that they are frequent instead.

The same amount of water purged once or twice will be much more effective in cleaning the boiler in the latter case.

But much more important is not to allow the water level to drop dangerously and to fall until it disappears from the glass. Which can make the firebox roof dry. In these conditions, the ceiling plate could no longer transmit to the water the amounts of very considerable heat that it is receiving from the fire and that heat, when stored in the plate, will increase its temperature very quickly, deforming it and even making it lose its resistance by softening it. which can cause a dangerous explosion.
The waters of Uruguay, coming from natural rivers, are generally soft and comparatively pure and cause little difficulty in service according to the above-mentioned indications.
An important part in maintaining the water of the boiler in good condition is washing it out periodically, and following the routines established in Uruguay at intervals of 3,000 to 5,000 km. of travel.
Fire management – Both in machines that consume oil, as in those that consume coal or firewood, it is necessary to maintain a uniform pressure in the boiler, as close as possible to the maximum allowed to obtain the maximum performance and what is so important to avoid sudden changes pressure that are harmful to the tie rods, tubes, plates and stays.
In order to maintain the highest production of the boiler, try to keep the temperature of the grate and the flame as high as possible. This is achieved naturally by burning all the fuel (combustion without smoke or with just a noticeable light gray smoke), but without introducing an excess of air that is not necessary for combustion and consequently causes a cooling of the flame and the hearth, because there is no more fuel to burn while unnecessarily increasing the amount of hot gases that come out of the chimney and that means a loss of heat.
The sudden excess of air, on the other hand, produces sudden cooling of the metal walls of the firebox, causing thermal contractions of the sheets that are the main cause of losses of the stays and cracks in the tube sheets.
It is also necessary to avoid throwing unburned fuel up the chimney (black smoke). That problem may come from working with too little air or from the fact that due to dirt or poor conduction of the burner it does not atomise or pulverize the oil sufficiently fine. In these circumstances and even when the oil drop is dragged through the air, it takes a long time to burn, resulting in that before being completely burned it collides with the relatively cold walls of the firebox or penetrates inside the tubes where it fatally burns., it goes out and is thrown unburned up the chimney.
This last circumstance ends up dirtying the surfaces that absorb heat with soot, isolating them from the hot gases and reducing the production of the boiler.
In oil-fired machines, good cleaning of the firebox oven and vigilance over the behaviour of the burner in case it has any dirt is extremely important. Also the accessories of the smokebox must be controlled by making sure that there is no air intake through the door or floors and that the 'jumper' works without difficulty. The use of the blower should be as little as possible.
For the operation and diagram of the burner, see sheet no. 1.
In the coal-fired machine, the good condition of the grate is of primary importance; the ashpan must be continuously wet and the dampers tightly closed. The maintenance of the fire is something that experience only makes perfect, but in general it is true that with moderately good coals a light fire is more difficult to cause difficulty than a heavy one and in the case of bad coal that produces a lot of clinker, a heavy fire can easily cause the lack of air intake through the grate with disastrous results. Tube cleaning is essential and similarly the lack of air leaks in the smokebox.
It is also necessary to keep the spark arrestor very clean in the smokebox so that there is no obstruction to the exit of the gases and to make sure that the mesh is intact, thus avoiding the passage of large sparks that can cause fires.

Boiler ancillaries
Introduction of water to the boiler – The injector is the most common type of accessory for introducing water to the boiler and its operating principle has already been described. The pressure type is illustrated in

sheet N ° 2.
There are pressure, lift and exhaust injectors.
The first two work as already described and are illustrated in plate No. 2.
The exhaust injector – Works with exhaust steam from the cylinders when the machine works with an open regulator and with live steam when it works with a closed regulator. Its operation is described in sheet N ° 3.
When the regulator opens, steam from the boiler is introduced, through pipe A towards the supplementary cone B (this cone only uses 2½% of the steam necessary to introduce the water and while the injector works both with exhaust steam and with steam from the boiler its role is to impart the necessary extra speed to the water)
Also the live steam from the boiler passes to the water control valve M and opens it admitting water to the injector.
At the same time steam from the boiler in pipe A passes through duct G to chamber D and F controlled by mushroom valve H.
With the regulator open, the steam from the intake pipe enters the chamber indicated in the diagram and lowers the valve I to its seat at the same time also making the valve H seat in its lower seat. In this way, the live steam from the boiler that enters through pipe A and conduit D continues through passages F to the exhaust steam control valve J, without passing through chamber C to the injector.
The exhaust vapour control valve J presses on the reservoir K and opens the valve VI. When the valve V 1 is opened, the exhaust steam enters, opening the valve V 2 and from there to the injector and in this way it works with exhaust steam.
When the regulator closes, there is no pressure in the chamber indicated in the drawing and valve H goes to its up position, actuated by the steam from the boiler by H 6 and D.
This closes the steam passage through F to the exhaust steam control valve J and the spring L closes the valve thus interrupting the communication between the exhaust steam pipe and the injector.
At the same time steam from the boiler passes through C and this comes to replace the exhaust steam and in this way the injector works only with live steam from the boiler.
As you will see, the action of the injector is automatic, changing from exhaust steam to live steam according to the movement of the regulator.
Safety valves – Its object has been explained.
Two more well-known types are used. The Ramsbottom valve and the more modern Ross valve.
The adjustment of these valves must be carried out by competent personnel, otherwise it may be incorrectly graduated and cause damage to the boiler.
While traveling, it is necessary to make sure that the safety valves open or blow at the maximum pressure marked on the pressure gauge and do not allow it to rise due to a failure of the safety valve. It is possible that the defect is in the pressure gauge, but in any case, safety (must be considered) above all, since it is preferable to work with less pressure than the maximum than with a pressure higher than the allowed one.
The types of valves are illustrated in sheet No. 4.
Fusible plugs – As the safety valve ensures that a dangerous pressure does not occur in the boiler, the fuse plugs are a security so that the boiler does not burn due to lack of water.
Fusible plugs are simple; steel plugs screwed into the roof plate of the hearth. They are perforated in the centre from side to side and filled with lead. As the plugs penetrate the ceiling plate and enter the boiler water, the fire does not melt the lead as long as the water level is correct, in the same way as you can boil water in a paper cup over direct fire.
When the water level in the boiler is allowed to drop too low and the tip of the plug is exposed to water, the overheating melts the lead and the steam and water enter the firebox and extinguish it, thus avoiding the danger of explosion and excessive heating of the firebox roof.
However, if the fire continues for some time without going out, the plates and pipes can suffer serious damage. It can sometimes happen that the water is low, but covering the plugs and making a sudden stop or

going up or down a slope reveals one of the plugs.
The melting of the fuse plugs is one of the most embarrassing mishaps that can happen to a crew and it is not authorised at any time to let the water go down, although to maintain the level it is necessary to lose time and even stop the train.
When entering and leaving service or when being relieved or relieving, it is the duty of every engineman to check if all the plugs are intact and without the slightest loss, because when leaving with a small loss, he runs the risk that this loss is exhausted by a previous heating. and let the lead fall while traveling.
Regulator valve – Already described and illustrated in plate No. 5.
It cannot be stressed enough recommending that in all possible cases (locomotives) should be worked with the regulator fully open. In saturated steam engines, the regulator should be fully open while the expansion period is equal to or less than 75% (25% admission) and in superheated steam engines when the expansion period is equal to, or less than, 80 or 85% (15 to 20% admission.) In most machines, one point of the lever means 15 to 20% admission. It is necessary to try to open the entire governor as soon as it is necessary to move the lever more than one point at any point, of both senses during normal gait.
A half-open regulator valve means, especially with a large steam demand, a pressure drop in the horizontal boiler in such a way that the pressure available in the cylinders is much lower than that available in the boiler, which constituting an unnecessary loss.
Working with the smallest possible cut-off (lever as far to the centre as possible) and the throttle valve fully open, the expansive possibilities of steam are fully utilized and the performance of the machine can be increased and consequently the consumption of fuel and water is reduced in percentages. very large that easily reach 15 and 20%, In this way the steam is expelled from the cylinders almost completely dead, naturally without this meaning that its exhaust back pressure is so little that the exhaust ejector does not produce the enough draft for the steam production that is needed.
The superheater – The operation of the steam reheater is illustrated in plate No. 6.
The fluid that the steam locomotive uses to transmit the energy of the fuel to the cylinders, transforming the thermal energy into mechanical energy, is water in a liquid or vapour state.
The greater the capacity of a kilogramme of fluid used to absorb heat, the greater the possibilities of providing work to the cylinders of that kilogramme of fluid.
Water to become steam at a given pressure absorbs a considerable amount of heat, but it is still capable of absorbing more if we increase its temperature, converting the already dry steam into superheated steam.
For the same boiler pressure, one kilogramme of superheated steam is capable of providing more mechanical energy than one kilogramme of dry steam, although it was naturally necessary to technically use more fuel to produce it.
However, taking a complete balance it can be shown that the performance is higher with superheated steam than with (saturated) steam, which ultimately means that more energy can be developed with the same amount of fuel or in other words that to do the same work there will be fuel economy.
The steam at the outlet of a boiler generally has a moisture content, that is to say, water not evaporated at the pressure of the boiler. This steam is introduced into the superheater, where out of contact with water, the small moisture content that it still had to evaporate ends up evaporating. Then continue to increase its temperature by absorbing more heat, turning into totally dry and reheated steam, that is, at a higher temperature of the boiler water.
When opening the regulator valve in the dome, the saturated steam goes to the collector, enters through several pipes, placed inside smoke pipes in the boiler and returns again to the collector, entering through other pipes and from there to the steam pipes at valves and cylinders. As it passes through the pipe inside the smoke tubes, it is superheated and its temperature is generally high, about 180 ° C, as has already been explained.
Level glass – One of the most common causes of serious damage to boilers is working with too low a water level.

The engines are equipped with two level glasses to indicate the water level in the boiler. See plate number 7. As there are two separate glasses, the driver can check if they are working properly, since if the level in one is different from the other there is a defect. The most common defect is the partial obstruction of the boiler ducts, which causes a higher level than the real one and, consequently, very dangerous. On the other hand, a tap level that leaks, will generally show a lower level than the real one.
As can be seen in the no. 7 sheet, the taps have their guage glass protector to save the crew in the event of an explosion of over and at intervals during the trip, it is the duty of the driverto bleed the taps to make sure that the passages are clear.
The level glass is one of the best lookouts for the machinist because it shows as accurately as possible the level in the boiler by marking the water level, which is clear because the steam in the glass is colorless.
When the water in the boiler is somewhat light and when it is dirty, the water level in the glass rises somewhat when opening the regulator and this must be taken into account when traveling before closing the regulator again.
Steam pressure gauge – This instrument is constructed of a tube placed in a circular shape inside a bronze box and the one that expands or contracts according to the steam pressure applied to it. Being in communication with the steam from the boiler, it expands and contracts according to its pressure.
As the tube contracts or expands, it operates a needle by means of a gear and this marks the pressure on the face of the pressure gauge that has been duly calibrated and marked.
Each pressure gauge is marked in red for the maximum pressure it should carry.
Fire as it is necessary to carry it taking into account the vapor pressure and the water level.
The distribution of steam – In the first part of this manual, the work of the steam was superficially explained.
Now we will enter the more detailed aspect of the problem.
When the steam reaches the steam chamber next to the cylinders, it must be directed to act in such a way on the pistons of the cylinders that they move in the direction and with the desired power.
For this the mechanism called (the valve gear) is necessary.
The valve gear is a mechanism that regulates the entry of steam and its direction, which determines the direction of travel, and whose mechanism is actuated by eccentrics that receive their movement from a shaft of the machine.
In plate N ° 8 a simple flat external intake valve is illustrated that distributes the steam to the cylinder on the outer side and sends it to the exhaust on the inner side, that is, the centre and of which its functioning.
The valve in fig. No. 1 is in its center position opening the cylinder port and the piston is at the end of the cylinder.
Figure N ° 2 shows the corresponding position of the were that in neutral back or C1, and the eccentric also in the position corresponding to this neutral, 90 ° advanced, that is, at point E1.
If we move the valve to the right, the left port will be closed up, steam entering through A and it continues to open until it is completely open and the eccentric has reached position E2.
The piston is now in position C.
The eccentric following its circular movement goes from E to E3 moving the valve back to the left and closing the steam inlet at E3 at the same time being about to open the exhaust at B.
The position of the piston is now C3, that is, having changed direction.
As the eccentric follows its movement, the valve continues to the left and reveals the exhaust ports for half a revolution and returns to its original place.
In this way, during the first half revolution of the piston, the cylinder received steam throughout the piston flow path and this steam was also released throughout the return course.
This way of using steam in the cylinder is obviously uneconomical since technically at the end of the piston stroke the steam is in the same state, that is, at the same pressure and temperature as when it entered the cylinder. In other words, the property that vapours and gases under pressure have of expanding developing

work is not used at all, that is, of returning another part of the heat energy that was expended to bring them to that state.
This system is the primitive one and does not allow the steam to be used expansively. In this way a very large quantity of steam is used and is released to the exhaust while it is still in working condition.
For this reason the valves have been modified so that they make the steam work expansively. That is, making a quantity of steam enter the cylinder during part of the stroke and then closing the inlet and outlet for another part of the stroke during which the steam will continue to exert pressure on the piston without further consumption during that stroke.
This is caused by the expansive property of steam and working in this way is called working the steam expansively.
The advantage of always working with the (reversing) lever as far to the centre as possible is now clearly appreciated, since in these conditions of reduced intake we are making the steam work to the maximum, taking advantage of its expansive conditions that we would otherwise waste.
Flap. - To make it work expansively, an extension called a flap is added to the valve. (See plate No. 9).
In the case we are studying, it will be clearly seen that by having the valve flap and moving to the right, the valve will have to move a distance S before the port is uncovered and steam can enter the cylinder.
But since to move the valve it is necessary to move the piston and thus actuate the eccentrics, it is arranged so that when the piston is in neutral rear C, the valve is about to open at A and for this the eccentric is arranged is advanced from the vertical and at this moment is in position 0 1, corresponding to the movement from 0 C1, to 0 E1, to the width of flap S.
Having now started to move the piston to the right, the valve also moves to the right by means of the eccentric until the maximum of its course is E2, and the tank is at C2.
The piston continues to advance, still receiving steam through port A, the piston continues its course, but the valve after the eccentric passed E2, begins to close and finally closes when it reaches E3, that is, directly in front of E1.
At this moment the piston is at C3, and the cylinder does not receive any more steam and from this point to the end of the course in dead point C4, the piston is driven by the bottled steam in the cylinder that continues to exert pressure due to its expansive property .
In addition to the above, the movements are designed in such a way that by means of the position of the eccentrics it begins to enter the cylinder before the piston has reached the end of its course in order to avoid a strong blow to the connecting rod. In the cases of machines running at speed this is of great importance and the "straight feed" (which is the term given to this arrangement) will affect whether the machine runs free or not.
The explanations given so far have referred to flat-type valves (illustrated in sheet No. 10).
In the modern locomotive, however, the piston valve type has been adopted today, which is illustrated in Plate No. 11.
The difference between a flat valve and a piston valve is only one of design and construction and the different stages of work are carried out in the same way.
The piston valve is the one adopted exclusively today for its superiority in terms of maintenance and especially for its reduced friction since it is automatically compensated.
There are also locomotives equipped with a mushroom valve, operated by valve lifters and eccentric shafts following automotive practice.
They are highly efficient, but in Uruguay they have not been adopted.

Types of valve gear

Stephenson type motion – Looking at sheet N ° 12, 13, an exact idea of the operation of this distribution movement is given.
It consists of a link L to which two eccentric rods called forward and reverse are coupled, which receive

their movement from two eccentrics themselves that are attached to the driving axle.
In the illustration the path of these eccentrics is shown by the circle in whose path points E1 and E2 are seen.
The link is suspended by two suspension arms S, attached to a reversing shaft which is actuated by the reversing lever through the reversing rod.
The sector has a hole inside which the die D that is coupled to the valve rod and this rod in turn to the valve.
Examining the plate N ° 12 it is seen that the lever is fully forward and in this position it has made the link go down to its maximum point, which results in placing the die at the highest point of the link where it is under direct influence of the forwardeccentric through the corresponding eccentric rod, coupling points E1 and A.
In that position with the wheel crank in neutral position up C, the valve allows the admission of steam, as shown, at the rear of the cylinder, which moves the piston and the machine forward.
Note that the exhaust port is open for the cylinder from the front.
Turning to sheet N ° 13, we see the lever in the centre of the toothed arc and the sector die in the centre of it, which makes the valve only move the distance corresponding to the flaps and therefore there is no steam movement.
Finally, in sheet N ° 14 we have the lever in reverse gear, the link die at the lowest point of the same where it is under the influence of the reverse eccentric and therefore the steam is admitted to the front part of the piston producing the backward motion of the machine.
By means of this movement it is seen that by placing the lever at different points of the toothed arc, it is achieved that the steam works more or less expansively due to the variation in the course of the valves.
Walschaerts valve motion –
Walschaert valve gear consists of only an eccentric, that is, an eccentric crank coupled to the power crank.
Its introduction was driven by the manufacture of machines with external cylinders and valves where the provision of eccentric types *polea* and *estrobo* would have been difficult to place.
Plate N ° 16 explains the different pieces that make up this movement.
The valve movement is obtained through two independent mechanisms.
From the crosshead and its couplings travel equal to twice the lap is achieved and the rest of the movement is produced by the eccentric crank and its linkage.
The crosshead has an arm that connects in Z to link4, which is connected in S to the combination lever. This is coupled to the T-valve puller and by means of the radial arm at B to the sector socket, coupling to the eccentric crank by means of the eccentric arm at E and X.
The radial arm is D-coupled to the suspension arm, and is driven up or down, moving the die in the same direction in the sector, through a set of bars and levers controlled by the reversing lever.
In the diagram we discussed, the crank pin is in neutral at the bottom and the return crank is 90 ° behind the crank. In this movement, no advance angle is needed since the movement equivalent to the lap is produced by the set of advance levers, link and cross arm as explained.
The diagram shows the position of the valves (closed) and given (centre) corresponding to the reversing lever in the mid position.
Plate N ° 15 shows us the relative position of valves, die and lever in forward gear, and plate N ° 17 shows it relative to reverse gear.
The difference between the Walschaert and the Stephenson movement is that the advance in the Walschaert is constant, while in the Stephenson it varies, increasing when the lever is retracted.
The advantage of the increase in advance with the Stephenson distribution is that when running at high speeds with the lever well retracted, the back pressure caused helps the piston change direction at the end of its course as smoothly as possible, but so that this is not too much, It is necessary to set the minimum feed to a lesser amount than what can be done on the Walschaert or less than 1/8 ", which can influence the ability or ease of starting the machine.

Lubrication

Hydrostatic lubricators – Commonly called "sight feed"

Examining plate No. 18 we have a diagram of a hydrostatic lubricator.

The letters explain the main pieces. It is seen that by opening the steam valve C, steam is supplied to the condensing chamber D and also to the passage of the oil to the valves and pistons.

The pressure of the boiler also acts on the condensed water D that is in communication with the oil tank through valve E and we have a series of tanks, pipes and tubes in which the pressure is balanced. But on the oil in the tank there is the extra pressure that represents the weight of the water column in the condenser.

This then allows that when the regulating valve of the dripper opens, the oil moves through itself and continues through the passage towards the check valve and from there emulsified with the steam in the passage, to the valves and pistons.

It is extremely important that both the steam valve C and the water valve E are fully open to allow constant operation of the dripper.

In the outlet pipes of the lubricator as well as in the inlet to the valves or cylinders, it is necessary to place shutter valves1, which ensure a constant oil distribution despite the continuous variation of pressure in the cylinders.

The orifices of these valves are enlarged over time, which makes the graduation of the drippers static, so that when there is a variation in the passage of the oil drops, the attention of the consignment should be called.

To fill the lubricator. - Close valve C for steam and valve E. Pour a quantity of water through the drain valve equivalent to the oil to be installed.

Fill the tank through cap B and screw this cap on.

Open valve C and then valve E and when the condenser and porthole glasses show to be full, regulate the lubrication by means of regulating valve J and according to the needs of the service.

If the drop is not visible, clean the droppers using the cleaning valve H.

Mechanical lubricators – The most common type on the FC Central is the "Peñarol" which is illustrated in plate N ° 19.

Mechanical lubricator UPO Peñarol – It is a lubricator designed and built at the Peñarol Workshops.

It only has one pump for all dispensing spouts, which gives it great simplicity compared to the "Wakefield" mechanical lubricators that have one pump for each spout.

However, it has an important defect that must be taken into account and that is that if the lubricator is emptied, the pump takes in air and then does not supply more oil until the air has been extracted.

For this reason it is necessary not to let the lubricator drain and if for any reason it has emptied, the consignment must be notified immediately.

At the same time, knowing this detail, the cause will be seen because in each trip the test taps of each spout must be tested.

Referring to plate N ° 19;

The lubrication consists of a reservoir A and pedestal J the pump is made up of a piston shaft D that works inside a tube H that is built inside the cylinder W.

The piston shaft D is driven by transmission G by means of gear F.

The gears F make the piston-pin D rotate and when rotating it raises and lowers actuated by the eccentric disc B that works between the rollers1 C.

When the piston pin goes up, oil enters the cylinder H through the opening K and when it goes down it forces it towards the jets J through the holes L.

Although it is possible to show two holes in the drawing, there are four one on each side of the one you see.

Automatic vacuum brake – Description and functions.

The automatic brake stops the train running in the same way as the ordinary handbrake by means of shoes that are applied on the rims of the wheels, and by the levers of its mechanism that receives its movement by means of a piston that works in a cylinder driven by atmospheric pressure.

The brake is continuous because each vehicle is connected to a pipe that runs from one end of the train to the other through which its action is transmitted, the cylinders of each vehicle being in communication with the general pipe.
An ejector placed in the locomotive extracts the air from the general pipeline and at the same time from all the cylinders, and when the vacuum is established in this way, it releases the brake, which is tightened when the vacuum is destroyed, that is, when the air enters the main pipe and under the plunger of each cylinder.
The brake can be applied by the driver from the locomotive apparatus or by the brake guard from the valve of the van, its action being practically instantaneous since the air penetrates through the general pipe at a speed of approximately 16 km., Per minute.
The brake is also tightened automatically and almost instantaneously when the train is cut or when breakdowns occur in its parts that allow air to be admitted to the pipeline.
The action of the brake can be precisely moderated either to regulate the speed of the train or to make soft stops in the stations so that the pressure on the brake shoes can be increased or decreased at will without separating from the wheel, being able This moderates the action of the brake on slopes regardless of their length, easily and safely without reducing the power of the brake in the slightest, ensuring that it is always fully available for any quick tightening when urgent stops call for it
Main steam valve – The steam intake valve has only two positions: open and closed. It must always be fully open while the locomotive is in service and fully closed when it is in the tank or consignment, in order to avoid condensation in the steam intake pipe. By closing this valve the ejector can be examined, even though the locomotive is under pressure. When the steam valve is used to supply steam for the automatic brake and the. same time to heat oil, etc., it should be closed only when the fire is not lit.
Ejectors – The combined ejector, class "C", is made up of two concentric cones, one large and the other small, placed inside the one whose purpose is to suck the air from the pipe.
The small cone must work continuously, its action being regulated by a steam stopcock that allows the vacuum to be regulated.
The large ejector acts when steam from the boiler enters it through a valve located on one side of the appliance. This valve opens when the operating lever is placed in the "brake off" position by means of a vertical rod moved by an eccentric that has been fixed to the end of the shaft of said lever and of the distributor disc.
The two ejectors work in the same way, that is, the steam passes at high speed around the cones, dragging the air from the main pipe and the brake cylinders through the exhaust pipe, expelling it through the chimney of the locomotive.
In order to achieve the best degree of vacuum, it is necessary to adjust the steam input to the cones. For this, it is enough to slightly open the corresponding intake cock.
The operating lever is part of the distributor disc and has the following three positions: "brake off" "middle position" or "gear" and "brake on".
The "slack brake" position is the one in which the lever must be set to quickly release the brake.
In this position the steam is introduced into the large ejector as already mentioned.
In the "middle" or "running" position the steam intake valve to the large ejector is closed and the air inlet holes are covered by the distributor disc. The brake is slowly released by the action of the small ejector el which continues to hold the void.
The "on" position is used to fully tighten the brake. The distributor disc completely uncovers the air inlet holes and, passing this through the perforated part, is introduced into the general pipe and produces the tightening of the brake.
During manoeuvres with wagons without a brake coupled and by operating the ejector lever between the "middle" and "on" positions, the brake force can be adjusted, increasing or decreasing the amount of air that enters the pipe, even when this operation it is best done by maneuvering with the specially created auxiliary brake application valve.

From the combined ejector and parallel to the general pipe, another auxiliary pipe of smaller diameter starts that communicates with the brake cylinders of the machine and tender. When the operating lever is in the "brake on" position, this auxiliary pipe remains in communication with the small ejector, which consequently continues to constantly maintain the vacuum in the container, and in the upper part of the brake cylinders. tender and machine.
A loosening wrench, which is located under the machine apparatus, allows the driver to loosen the brake of the machine and stretch, being able also by means of this wrench to regulate the variation that may exist between the general pipe, the train cylinders and machine cylinders and tender, a difference that generally arises when the machine is coupled to a train.
The maneuvring lever of the large ejector must work without any obstruction and it must be ensured that the air inlet holes of the distributor disk are not clogged with dirt or foreign matter.
The spout and automatic drain valve must be kept clean so that the condensation water can be evacuated to the outside.

Dreadnought type combination ejector.
In order to respond to the work circumstances that the constant increase in the length of the trains requires, which necessarily results in a much greater volume of air to be extracted from the cylinders, tanks and brake pipes, it has been adopted the improved "Gresham Dreadnought" type of ejector whose advantage is that it is not only interchangeable with the "C" class combination ejector, but is also made up of the same parts with few exceptions. These exceptions are mainly the steam cones or pipes and the small check valve placed between the large and small ejector.
In this type of ejector, the parallelism of the cone joints, which usually causes difficulties, has been eliminated; Now it is enough to screw the cones tightly onto their holes, an operation that does not require any trial and error or precision in the adjustment.
These cones are extremely simple in construction and their effectiveness no longer depends on a delicate fit to the ejector body.
This type of ejector is equipped with a newly shaped automatic vacuum graduation valve, and a self-closing release valve.
The vacuum graduation valve is designed in such a way that it does not open until exactly the specified degree of vacuum is reached.
The loosening valve has larger orifices, so it works faster and automatically stays on its seat, avoiding the risk of inadvertently leaving it open.
The check valve, placed in the upper part of the spout that connects the vacuum containers of the tender, with the machine, can be easily examined and kept in perfect working order without having to disassemble the valve body, or to make no board.
This check valve also makes it possible to remove the ball valve from the machine cylinders and to tender.
This combined ejector works the same with the high pressures of modern machines as with the low pressures, so it is adaptable to locomotives designed to run on lines that offer large gradients, which often causes strong pressure drops in the boiler.
The "Dreadnought" combined ejector has a small cone of 20 m / m. diameter and a large 30, a combination that experiments and practices have shown is the best result for two-inch general pipes.
In sheet No. 20 you can see the operation of this ejector.
Disc 2 actuates shaft 3 and lifts valve 6 allowing steam to enter larger cones 16 and 16a.
The steam passing between these two cones produces a vacuum that absorbs the air from the pipe inside the ejector body through suitable ducts and the air and mixed steam pass through pipe B into the atmosphere.
This as for the large ejector.
The small ejector activated by the handle No. 15 and shaft 10 allows steam to pass through the small cones 18 and 18a. and in the same way it sucks the air from the pipe through suitable ducts.

“Súper Dreadnought” ejector – This ejector meets the needs that have arisen with long trains where, although the pipe is in very good condition, there are always small losses that together affect the formation of a vacuum.
The Super Dreadnought ejector consists of a large cone measuring 30 m / m, and two small ones measuring 15 m / m each.
If the train is long and with very little loss, one of the small 15 m / m cones can maintain the vacuum on the journey by saving 44% of steam over the 20 m / m cone, from "Dreadnought", and if the losses are such that a 15 m / m cone cannot maintain, so it will do so with the two 3.5 m / m cones at the same time and representing an economy of 12% steam due to its better design.
Examining plate No. 21 can clearly see the passage of steam, air and steam and mixed air in this type of ejector which is of the same principle as the previous types.
Locomotive (shunting) brake valve, or *Macaco* – From the general pipe, underneath the braking device of the locomotive, there is a pipe with a smaller diameter that communicates with the lower part of the machine's cylinders, and a brake valve is placed at the junction of these two pipes to facilitate movement during maneuvers, a valve that is made up of a disc with a hole and a handle, commonly known as "Macaco".
By means of this valve, the driver can individually tighten the brake on the loco and run without destroying or altering the vacuum in the general pipeline.
When the said disc has the handle totally downwards, that is to say in the "brake off" position, its orifice is in communication with the general pipe and therefore in a condition to establish a vacuum in an ordinary way, while the air passage is intercepted. from the outside, but by raising the referred lever to its "brake on" position, communication with the general pipe is intercepted and the air inlet is intercepted (due to the arrangement of the holes), which by operating underneath the piston cylinders of machine braking and tending causes braking.
The air inlet through this valve can be easily adjusted so that braking can be done with great accuracy.
Automatic purging valve – This valve consists of a container that is placed in the lower part of the vertical pipe of the general pipe that descends from the combined ejector, said container collects the condensation water that may form and has an automatic ball valve, the which is fixed in a perforated cage, which must be kept clean for easy drainage of condensation.
When the vacuum is established in the general pipe, the ball is applied on its seat, but, as soon as it is destroyed, it separates and allows the water contained in the container to escape to the outside.
This valve must always be properly clean in order to prevent the accumulation of foreign matter from hindering its operation.
Creating vacuum – The engine is hooked to the train and all the brake hoses are coupled between the vehicles, making sure that the tail hose is in place; On the head end, the machinist will actuate the small cone, establishing in a short time a vacuum of more or less than 20 inches, this cone having to operate continuously in order to maintain the vacuum obtained.
The air that has penetrated the main pipe and under the cylinder pistons cannot pass to the upper part of the cylinder because it is prevented by a rubber rolling ring carried by the piston.
Except for urgent cases, the application of the brake must be carried out moderately, for this the driver must use the auxiliary air intake valve that allows him to regulate the action of the brake to make a smooth stop, also having the advantage of being able to form the simple vacuum again by completely stopping the train, giving in conditions to continue traveling immediately without using the large cone.
To loosen the brakes of a train uncoupled from the machine, the wires carried by the vehicles are pulled on each side. These wires are attached to the lever of the loosening valve and when the valve is pulled out of its place, allowing air to pass to the upper part of the plungers and when the same pressure is established on both faces, they go down under their own weight.
When the driver squeezes the brake abruptly, the van valve is lifted automatically and air is introduced at the

same time through this valve and through the locomotive's ejector, increasing the speed of braking, then closing under its own weight as the vacuum is completely destroyed. empty in its container.
Brake cylinders – There are two types of brake cylinders, those with a separate vacuum container used in machines and tender and the combined type without connection to a vacuum container and used in wagons.
Examining plate No. 22, we have the type of cylinder with a separate vacuum container that consists of a cylinder body (1) within which the plunger (2) works and with a cylinder cap (3).
The stem (4) is screwed into the piston, which is connected by rods and supports to the brake shoes. The stem works in a press composed of a guide (6), a press box (5) and a rubber bushing (11).
At the bottom is the loosening valve (12) with its diaphragm valve (13).
As you can see, the release valve has two pipes, one connected to the general pipe and the other to the vacuum container.
Also the plunger has a rubber rolling ring (9) and a ball valve (8).
Also, in the upper part of the plunger we have three little holes1.
The action of the cylinder is as follows: when a vacuum is formed by means of the ejector, the air is extracted from the convoy pipe and from the lower part of the piston through pipe B. The air in the upper part of the piston is extracted through the valve ball (8) and the holes A.
Being extracted all the air and therefore being balanced the pressure above and below the piston, it descends due to its weight and releases the brakes.
The application of the brake consists of introducing air into the pipeline through the brake apparatus in the machine.
The air is introduced to the lower part of the plunger, which rises under the pressure of the air. As the plunger begins to ascend, the rolling rubber closes the holes and the plunger continues its course upwards, tightening the shoes on the wheels through the mechanism of rods and supports.
Release valve – When it is necessary to unload the cylinders or that is to say to loosen the brakes without the help of the ejector, the release valve to illustrated in plate 22, No. 12 is used.
It is placed in the lower part of the cylinders, it consists of a rubber washer that is applied to the communication hole with the upper part of the piston.
The valve stem protrudes to the outside, passing through a rubber diaphragm held by its edges between the valve body and the valve cover, and carries a small lever at its end that can be maneuvered by means of the wires placed at the sides of the vehicle. By pulling these wires, the valve separates from its seat, freeing the communication between the general pipe and the upper part of the plunger.
When the vacuum is established in the general pipe, in the cylinder and in the valve itself, atmospheric pressure acts on the outer face of the diaphragm, returning the valve to its place, automatically closing the referred communication orifice. This valve does not work at all in brake applications or in re-establishing the vacuum, its sole purpose being to relieve the brake cylinder by hand.
Locomotive and tender brake cylinders do not need a valve for manual release.
This is obtained by means of a loosening key placed close to the combined ejector.
Vacuum canisters are used with separate canister cylinders in order to increase the volume of the upper chamber of the plunger, so that the greater the capacity of the container, the more effective the action of the cylinder. The loosening valve of the cylinders of separate containers, or the connecting piece put in place, has two branches, one for the communication of the general pipe with the lower part of the plunger lo and the other to connect the vacuum container to the upper chamber of the cylinder.
Looking now at Diagram (2) of plate 22 we have a combined cylinder as used in wagons.
The operation of the plunger is the same, but in this case it has a vacuum chamber around the body of the inner cylinder which acts as a vacuum container.
The description made refers to the most modern cylinders, called types E. The old type Cs are very similar, but they do not have the ball valve inside the plunger, and the release valve is a ball instead of a diaphragm.
Lately, cylinders are being used that instead of piston pistons have a rubber diaphragm. There are different

opinions as to the superiority of one or the other system.

Automatic vacuum gauge – The vacuum gauge for the driver has two needles: the one on the left indicates the degree of vacuum existing in the general pipe and in the brake cylinders: the one on the right indicates the degree of vacuum produced in the engine reservoir or tender.
When the brake is pressed, the left needle indicates the degree of vacuum that remains in the main pipe and below the cylinder pistons, while the right hand continues to show the vacuum existing in the engine container and the tender in the part. top of their corresponding plungers. The difference between the indications of its two needles thus reveals the energy with which the brake is applied. For example, if these indications were 10 inches of vacuum for the general pipe and 20 inches for the vacuum containers of the machine, the brake would be applied with a force of 10 inches or approximately half of its total power.

Brake van valve – The air valve of the van is placed in the upper part of an iron pipe that (connects) with the general pipe penetrating the van next to the place allocated for the guard; If you press the floor, it will open the valve, introducing the air into the main pipe and under the pistons of each cylinder, braking the train, it is enough to be stopped, even when the locomotive runs with the regulator open.
Talion This valve works automatically when the driver applies the brake abruptly, when the train is cut or when a major failure occurs in the pipes that admits the entry of air into any part of the train with violence.
The valve stem is drilled with a 1/16 "hole, the general pipe being in communication with the vacuum container, superimposed on said valve, passing through the diaphragm that closes the lower part of the container. which is produced vacuum when the air is extracted from the general pipe.
If the tightening of the brake is verified slowly, the vacuum in the aforementioned container is destroyed to the same degree as in the general pipe, in this case the valve does not work; but if the brake is applied quickly, given the smallness of the communication hole, the vacuum existing in the pipe and therefore under the valve disappears much faster than that existing in the container and then the external atmospheric pressure acts on the diaphragm by lifting the valve, which remains in this position until the vacuum is completely destroyed in the container.
The brake pressure gauge on the van is attached by means of a pipe to the upper part of the valve's vacuum container and, by means of a pressure gauge, marks the degree of vacuum set.
Emergency valves – A limited number of passenger cars have been equipped with special valves that in an emergency can be used to stop the train. These valves have pressure gauges to indicate the degree of vacuum that exists in the brake.
Each valve bears the following inscription: "To stop the train, break the glass with any object other than your hand." "Misuse will be punished as prescribed by law."
It will be the duty of the guard to ensure that passengers do not commit abuses by stopping the train without justification and in such cases the offender will be handed over to the police authority.
By breaking the glass of this valve, the air that penetrates causes the destruction of the vacuum and consequently the braking of the train, and the vacuum cannot be re-established if the inlet tap is not closed, thus rendering the valve useless.
This tap has a cut or scratch in the part where the guard key will be placed, when this cut is in a vertical position the tap will be open and therefore the valve in a position to operate, but when said tap is closed, that is, disabled said referred cut-off valve must be in a horizontal position.
Brake hoses –These parts are made of rubber tubes, reinforced with wire and lined on the outside, allowing the coupling between vehicles,
The upper end of the sleeve is secured to the tip of the vehicle's brake pipe near the head.
At the other end is the nozzle formed by a cast piece that has two protruding spikes or spikes with a groove between these two spikes while another crooked horn-shaped spike protrudes from the opposite side, devices that provide the coupling between the two hoses.

Each nozzle on its forehead has a rubber washer housed in a circular groove. These washers provide airtight gaskets in the coupling of the sleeves preventing the passage of air.
Any brake hose when fitted to vehicles must have the straight pins towards the top of the coupling and the horns downwards.
To connect them, they are first raised to a sufficient height, until the lower horns can cross and make a good joint.

Third part
Practice
Instructions for operating oil-fired locomotives
1st – Procedure for the lighting of the fire:
Before lighting the fire, it will be necessary to make sure that the boiler contains water, that the bottom of the firebox (in front of the burner) is free of bricks or any other obstacle that could intercept the free passage of oil, from the burner to the the other end of the firebox, and make sure that the brickwork in general is in order and that the traps are in perfect working order.
Then proceed as follows: -
1) Open the relief taps that exist under the tank, in order to drain the water that was in the oil tanks.
2) The reheater steam valve should be opened enough to draw the water out of the pipes through the reheater tap, which should be in the open position.
3) Once the aforementioned operation has been carried out, said valve is closed and the sprayer will be opened enough to extract the water deposited in the pipes.
4) Open the steam tap to heat the oil in the tank and also the reheater, letting the steam pass for a reasonable period before trying to light the fire.
5) Open the blower as far as possible, in order to create sufficient air draft between the boiler tubes and the firebox.
6) Open the oil valve gradually until the oil ignites, using for this purpose the lighter device already provided, arranging the flame so that the consumption is strictly what is necessary.
The lighter must be inserted into the firebox through the hole in the mouth of the hearth, keeping the door closed.
7) In this way, the boiler will be heated slowly as desired, because if the fire is pressed too much, it will produce a rapid expansion that will cause damage to it and loss in the tubes. The fire should stay that way, that is, as low as possible, until the pressure gauge reads 100 pounds.
During all this operation, it is of primary importance to adjust the air traps, since in order to carry out a complete combustion an exact combination of oil and steam in the sprayer with the correct air intake, the draft is graduated by means of the blower. Preferential attention should be paid to the following
a) Black smoke from the chimney indicates lack of air and poor combustion.
b) Yellow smoke, too much air.
Therefore, the best state of the fire is indicated by the exit of only a trace of smoke from the chimney.
The boiler must never be forced and for this purpose the time necessary to raise steam from the cold state must be around 3 hours long for large machines, that is, classes V, S, R and T, and 2 hours long for large machines. other machines.
It may happen that, when starting a cold machine, the fire goes out and therefore it will be necessary to monitor it until the machine has warmed up.
When relighting the fire in a hot machine, it will be necessary to make sure that the blower is wide open so as to expel the gases from the firebox and pipes, since any negligence in this regard can cause the explosion of the gases.
Whenever a fire is lit in a machine, it will be necessary for the person engaged in this task to stand to one side of the firebox door, in order to avoid an accident in the event of an explosion of the gases.

If in any case it is necessary to light the fire with wood, special care must be taken not to damage the brick oven or the burner.
After sufficient steam has been raised in the wood-burning boiler, all residues and foreign bodies must be removed from the firebox.
For greater safety against fires produced by embers of wood left in the firebox and sent by the chimney while traveling, it is necessary to make the machine work hard before leaving the consignment according to the instructions.

2 ° - Procedure for extinguishing the fire:
a) First, the oil valve placed on the tank must be closed, closing the valves in the following order; first the oil regulating valve, then the sprayer and then the ashtray traps, also making sure that the tank drain valve is closed. It is extremely important that the ashtray traps and the chimney lid are closed, to prevent the entry of cold air through the firebox and pipes while they are hot, after the fire has been extinguished.
When the engine personnel leave their locomotive at a point where there is no cleaner or person in charge of it, it will be their responsibility to put out the fire or close the traps, as well as cleaning the pipe and burner as indicated in section b) of this article, and cleaning the firebox.
When closing the steam regulator of the machine, you should reduce the fire and reduce the air intake through the ashtray traps as much as possible. When extinguishing the fire, you must completely close the ashtray traps and the chimney lid.
b) When storing an oil machine in the shed at the end of its service, proceed as follows to clean the pipe and oil burner.
The handles will be positioned as follows:
Oil Regulating Handle Closed
Oil valve in the tank. Open
Reheater valve. Open
Reheater drain cock. Closed
With the valves in this position, the valve to clean the burner will open and then the oil regulating handle will open fully.
The valves will be left in this position, until the passage of steam to the tank is heard; Then he closes the valve of this and then in successive order the regulating handle and the reheat valve, thus leaving the pipe clean.
As the valve for cleaning the burner is still open giving way to steam and the oil valve that works by means of the handle on the box is closed and steam going to the fire box through the oil passage of the burner thus cleaning this latest.
Finally, the valve must be closed to clean the burner, making sure that it is properly closed, otherwise it will hinder the action of the burner.
Once these operations have been carried out, the reheater drain cock will be opened.It is important to check the flexible pipes for oil between the machine and lay down every time the above-mentioned operations are carried out as well as every time the burner is cleaned in case there is loosening that may produce losses.

3rd - Burner Noise:
When the burner produces noise, this is due to the following causes: defects in the construction of the brickwork of the firebox carelessness on the part of the fire operator in handling the oil regulating valve when the machine works slowly finding the nozzle valve too much open or too much air is passing through the ashtray traps.
When working with local trains, bondholders must take great care in handling the oil regulating valve and sprayer in order to avoid inconveniences of this nature.

4th - Oil temperature:
To obtain economic results, the temperature of the oil inside the tank should not exceed 38 degrees Celsius since they are heated again in the king heater. This temperature is calculated by touching the oil pipe with your hand when it should feel very warm. When the oil is heated, it enters the deposit by direct value, it is of utmost importance that only the absolutely necessary steam is admitted, since the condensation can then hinder the continuous flow of the oil to the burner.
The machine personnel must carefully observe the chimney if the smoke is emitted by it irregularly it is an indication that the drain cock of the heater is closed or covered.
When this tap is closed, the steam that goes to the superheater from its valve condenses and fills the heater with water, which when cooling does the same effect on the oil pipe that passes inside the superheater, damaging the evaporation of the boiler. Therefore, it is necessary to keep the mentioned tap open and free of obstructions, it can also cause intermittences in the flow of oil the fact that there is a loss in the burner division between the oil and steam chamber or a loss of steam from the valve to clean the burner.

5th - Black smoke:
At all times, an attempt should be made to avoid black smoke, as it is evident proof that there is a defect in the construction of the brickwork, a bad method in handling the burner or bad handling of the air traps.
The soot formed by the smoke is a conductive frame of heat and will cause a machine burning oil to make steam, for this reason the frequent use of sand pipe cleaner (sausage) is recommended.
To carry out a complete combustion, an exact combination of oil and steam is necessary in the atomizer, with the correct admission and distribution of air. It is the duty of the fire operator to be prepared to carefully observe the way in which the driver works his machine, in order to properly regulate the fire and control the admission of air, according to the draft produced by the exhaust, in order to achieve a good combustion as indicated by the exit of a little smoke through the chimney, as already indicated:
1) Black smoke from the chimney indicates a lack of air or too much oil leaking into the firebox.
2) When there is no smoke or there is yellow smoke it indicates too much air.
The good handling of the clamps is of the utmost importance, as it has a decisive influence on the vaporization of the boiler and consequently on the economy of oil consumption and also tends to preserve the tubes and firebox.

6th - Handling the oil reheater:
When handling superheaters, special care should be taken to avoid accumulation of high pressure steam in them since this causes intermittence in the passage of oil to the burner. The trap should be fully open and the reheater valve slightly open to allow smooth passage of steam through the reheater.

7th - Precautions to avoid fires:
Foremen and machine personnel must take special care to avoid accumulation of carbonaceous materials in fireboxes, and thus the possibility of fires. When the machinists observe that the chimney emits sparks, they must report in their journal and write it down in the repair book.
Carbonaceous matters are formed by the following causes: on the side plates of the firebox, when the burner is not on line; air passes between the brickwork and the ashtray plates, or when there is any obstruction between the burner and the wall of the firebox.
These materials can later be thrown down the chimney, due to the pulling of the exhaust pipe, which can cause fires. Throwing pieces of tow1 or any other flammable material on the floor of the machine from where it can be carried into the firebox through its door, also facilitates the origin of fires.
The sand provided for cleaning the tubes should be carefully examined to ensure that it does not contain pieces of charcoal, wood, or any other flammable material. It will be the duty of the driver to inform about the condition of the sand, if he or she notices that it contains flammable materials.

8 th - Smoke that produces soot clogging the boiler tubes:
When the locomotive starts to move, the regulating valve should be opened gradually, taking special care to keep the temperature in the firebox as uniform as possible. Oil consumption should be increased gradually, according to the demand for the service. The fire should not be forced. If the pressure drops 5 or 10 pounds, the maximum pressure should be gradually restored.
Forced fire will fill boiler tubes with soot, overheat plates, burn rivet heads and stays, and cause boiler leakage.

9th - How to use the sand:
The tubes are prone to being clogged with soot and therefore must use sand to clean them. Cleaning must be carried out in appropriate places, the first of which as soon as possible after starting the trip and the last as close to the destination of the machine.
As long as there are quantities of black smoke, the use of the sand should be continued, giving the funnel a lateral movement, in order to clean the side and centre tubes.
The firemen must be careful when cleaning the pipes with sand, using the strictly necessary amount of this material. This work will be done when the machine is running and working hard enough to draw the sand through the tubes.
The drivers will make the machine work hard so that the draft can drag the sand through the tubes and thus fulfill the mission for which it is destined.
The crew must act according to their criteria when using the sand, avoiding that the chimney emits ignited soot when passing through places where flammable materials are stored. The use of sand under signal bridges and where soot can damage buildings is prohibited.
When cleaning the tubes, special care must be taken not to spill sand on the floor of the cab, as particles of this can get into the axle boxes of the machine and cause over-heating, and for more safety, before starting operations, place the bucket under the firebox door.
The correct way to clean tubes is to insert the funnel as far as possible into the firebox through the hole in the centre of the door by moving it sideways. In the machines that have a thermo-syphon in the firebox, the funnel with sand must first be directed on one side, it is filled again and the operation is repeated on the other side as it is necessary to prevent the sand from hitting the siphon.
When doing these operations, they must reduce the air intake to the firebox by means of the ashpan dampers.

10th - Insufficient oil flow to the burner:
Burners are prone to clogging with sand or other foreign substances that oil may contain. A partial or complete blockage of oil in the callus or in the burner can be removed using the valve to clean the burner as already explained. If the obstruction does not disappear, check the strainer inside the oil drainpipe and clean it if necessary.
To clean the reheater and the oil dispensing pipes, proceed as in the case described when turning off the machine. If the obstruction persists, it will be necessary to uncouple the burner pipes and make a careful examination of the burner and the pipes and reheater, in order to find the obstruction. Care should be taken that the valve to clean the burner is closed, except when it is used to clear pipes and burner because if it remains open or has a leak, it will prevent the free passage of oil to the burner, causing a series of explosions, such as also the emission of black smoke from the chimney.
In case of rupture of the oil heater pipe in the tank and it is necessary to heat it, this operation must be done by passing steam through the oil dispensing pipe, using the same procedure as to clean the pipe as indicated in subsection "B" of the Article N ° 2,

11th - Water in the oil:

In the event that the fire goes out due to unknown causes, the tank drain valve should be used to check if the oil contains water. There are times when water accumulates in oil tanks, due to the improper use of steam to heat it or when the machine has been idle for some time. The heater must be opened at once, heat the oil and close it again, the operation of which will be done frequently while the locomotive is stopped.
It is bad practice to partially open it to let it work continuously.

12th - Fall of the bricks or blows of fire against obstructions caused by the formation of slag:
A locomotive will not produce enough steam and will make excessive black smoke if the fire licks the bottom of the ashtray or hits the bricks, and any obstruction must be removed that will be noticed without loss of time being the best opportunity to carry out this operation, when they are standing at a station.

13th - Complete or partial opening of the burner mouth:
If the obstruction does not disappear when the burner valve is fully opened, the burner mouth should be cleaned, uncoupling it.

14th - Working the machine with the fire off:
Before moving the machine, it will be necessary to light the fire, in order to avoid the draft of cold air between the tubes, which causes them to lose. Great care must be deployed to avoid this irregularity.

15th - Tank cleaning:
If it is necessary to carry out any work inside the oil tanks, once they are empty, the tank must first be filled with water, then a few kilos of caustic soda must be placed inside it, then open the steam through the heating pipe until the water boils over the tank. top.
As oil contains a more or less high percentage of gases, which do not need a high temperature to explode, it is strictly forbidden for this reason to carry lighted lamps, lamps or lanterns inside the tank or near its openings, when these have oil content and as long as the tank has not been completely clean.

16th - Inspection that foremen must do to oil-burning engines:
When a locomotive that consumes oil arrives at the Remittance, the following detailed inspections will be carried out:
Inspection of brickwork to see if it is free of brick blockages or charring.
Examine the joints of the ashtray and firebox in order to verify that they are hermetically closed.
Make sure the burners are completely clean.
Let the wool1 of the burner spread out centrally.
That the smoke box is hermetically closed.
Steam pipes and exhaust pipes should be carefully checked.
Traps and openings for air intake should be thoroughly cleaned.
There should be no slack in the levers, bolts, etc., that make the oil regulator work to the burner.
The sand that is intended for cleaning the tubes must be fine, well shaken, dry and free of any foreign matter.

Summary of precautions
The blower should not be used louder than enough to clean the chimney of black smoke as otherwise it is an unjustified waste of steam for unnecessary noise and if slow combustion can cause losses in the tubes.
Before moving the machine, make sure that the fire is lit and the ashtray traps are in positions to prevent too much air from entering the box.
of fire because with little fire and a lot of cold air the tubes and sheets can suffer damages.
They should not approach a distance less than 3 meters from the lid or tank vents with a lamp or flashlight lit to ensure the amount of oil in the tank, the measurement made for this purpose will be used, and must be

taken after it is placed in the tank. to the light, in order to give the amount of oil that the tank still contains.
The air inlet must not be allowed to be obstructed by the accumulation of slag, sand or pieces of the brickwork falling in the center of the ashtray, obstacles that must be removed immediately.
He should not be thrown into the firebox at any time, mauleras, tow or any other foreign body.
The information on any oil loss that will be noted in the tender or annexes should not be omitted.
The fire must not be totally extinguished at a point where there is a cleaner who is in charge of the locomotive, who is responsible for taking it to the Remesa, putting out the fire in accordance with instruction No. 2.
The machine should not be left for some time with the fire out, without first placing a cover on the chimney, to avoid the absorption of cold air by the firebox and the pipes. In addition, all traps will have to be closed.
The measuring rod should not be wrapped with tow, as the tow can go into the oil tank and cover the pipes and burner.
It is not advisable to set the nozzle too low since it will allow the oil from the burner to fall in drops.
The oil valve should not be opened quickly and should be opened gradually.
The blower should not be used when the machine is working with steam

Automatic brake operation

Role of the crew. - Before leaving with a train, the driver must be absolutely sure that the automatic brake of his machine is working properly, since any defect can have serious consequences for the safety of the train he is driving.
The forward-thinking driver must never wait for the moment when his train demands the action of the brake to make sure that it is working. He has different means at his disposal to make him understand that the brake is in a position to respond widely when applied.
At the very least, he must be sure that the brake of his machine is in a position to respond properly when the case requires it and this will be achieved by testing it in the maneuvers he performs before the final coupling for the train's departure.
When taking over a machine, the driver must make maneuver the different parts of the braking device to ensure its operation; that the extraction of the air first, and the introduction later. It is carried out freely without being obstructed by foreign matter or dirt accumulated in different parts; Tender and machine brake cylinders are capable of responding broadly and vigorously in all applications.
It must bedriver must worry so that it is not the hitching or maneuvering laborer who notices defects in the brake sleeves, ovalillo, etc., etc., of the machine, since any defect noticed at this time will delay the train to repair it.
The driver, on his part, has to pay special attention so that his machine goes to the train with the automatic brake in the best possible condition.

Duties of the driver before starting the trip.

For this purpose, see what is stated in Article No. 281 of the General Regulations of the F.C. Central.
Before starting the journey, at the departure station and at all points where there has been a need to uncouple a hose, the driver must make sure.
1 ° - That the sleeve of your machine is properly coupled to the first vehicle of the train. In the case of coupled machines, this duty will correspond to: the staff of the second machine and the first one to make sure that the two machines are properly coupled.
2 ° - That the pressure gauge of the machine indicates at least 17 inches of vacuum after complying with the provisions of the previous paragraph.
Once the machinist observes that his machine is properly coupled to the first vehicle of the train, he must immediately initiate the establishment of the vacuum in the brake, opening the steam stopcock through the small conical, this ejector having to operate continuously to be able to sustain the vacuum obtained, that is,

to be able to continue to continuously extract the air that can penetrate through different parts of the general pipe, sleeves, cylinders, etc., etc.
If there is an urgent need, the driver can quickly establish the vacuum, giving way to steam from the large cone, maneuvering the lever of the air distributor disc up to the "slack brake" position.
When coupling the machine to the train for the first time, before departure or after taking a considerable number of vehicles in intermediate stations, the driver cannot know what degree of vacuum he will be able to sustain with the small ejector, hence this first operation has If it is for the machinist, as a test, so when using the large ejector he must do so prudently, letting it operate until the regulation 17 inches of vacuum is obtained, then he must allow the small ejector to operate, which will only establish the degree of vacuum that can hold.
In this first operation, once the regulation 17 inches of vacuum has been obtained with the use of the large ejector, you must move the lever to the middle position and if the vacuum drops, you can repeat the same operation again.
After this first operation, when the driveris already sure that the small ejector can sustain 17 inches of vacuum, then in subsequent cases, when there is a need to establish the vacuum quickly, he can operate freely with the large ejector until obtaining the required vacuum. large until you get the degree of vacuum that you can sustain with the small ejector.
The brakes of the engine are provided with a vacuum regulating valve, whose coil spring is adjusted so that when the vacuum rises to more than 22 inches, this valve opens giving way to air, thus preventing the vacuum from being sustained. in a higher degree.
Accordingly, the action of the large ejector has reached the end of its role when the driver observes that on the loco's pressure gauge, the vacuum has risen to 22 inches, so that when obtaining this degree of vacuum, the driver should not continue using this ejector, because the vacuum in the brake has already reached the maximum degree of completion and after this, the action of the large ejector is undue and counterproductive, since while the passage of steam through the large cone removes the air, this is penetrating through the vacuum regulating valve, thus causing a useless waste of steam.
When the driver observes that the vacuum in the automatic brake rises to more than 22 inches, it is proof that the regulating valve is not working properly and it should be checked immediately to correct the defect. This valve should be checked frequently to prevent dirt or foreign matter from causing it to wedge.
When, despite being properly clean, the valve does not work when the vacuum rises, and allows it to rise to more than 22 inches, it is likely that the defect consists in the graduation of its elastic. In this case, the driver must report the defect noting in his daily report and in the repair book.
The air distributor disk with the large injector operating lever must be examined by the driver in order to observe that it maintains its proper adjustment, without having greater slack than that necessary to provide a smooth movement in its handling, the use of wrench to tighten the axle nut, an operation that has to be carried out only with the pressure of the fingers as it must be taken into account that it has been enough to make a seal and prevent the entry of air between the disc and the body of the sector.
The surface in contact between these two discs must be accepted with cylinder oil, but in the least amount possible, taking care not to interpose foreign matter between both surfaces, which could prevent a good joint.
The driver must be absolutely sure that the air intake holes in the maneuvering disc are completely clean. how well they are before taking your machine to the train that the brake sleeves and ovals are in proper condition.
When the loco is attached to the train, it is not possible to obtain the regulatory vacuum in the brake, it is the driver's obligation to facilitate the task of the train guard by cooperating with him to carry out the brake test of the engine corresponding to the wagon makers and the placement of the wagon. perforated sheet (1/4 ”in diameter), in the brake hose to be attached to the train, either from the tender or the engine, the driver having to operate only the small ejector to establish the degree of vacuum and if it rises and held at a steady 17

inches without drawing air through the drafting valve on the ejector, it is proof that the locomotive apparatus is relatively good. Although this test can control the power of the loco apparatus, it is not enough to give us the assurance that the brake is in a position to properly extract the air from the main train pipe, given that any obstruction in the brake pipe of the engine, between the apparatus and the coupling sleeve that is not coupled to the train, can prevent the absorption of air. If it is found that the air absorption power through the perforation in the sheet is high, it is evident that there is no obstruction.
In the case of obstruction in the brake pipe of the machine, the test carried out with the perforated sheet is null, because the obstruction in the pipe has not allowed the free passage of air.
To make sure that this defect does not exist, it is necessary to carry out a second test in which regard the guard has instructions so that once the test with the perforated sheet is carried out, when it is withdrawn, one of the pressure gauges must be placed in the same brake hose. hand the one that saved small difference must use the same degree of vacuum as the pressure gauge of the machine.
If a positive result is obtained in these two tests, it is to accept that the brake of the machine is in good condition; but if this test with the hand pressure gauge gives a negative result, accusing that difference of consideration between this pressure gauge and that of the machine, it is to be assumed that there is an obstruction in the case of the brake. When this happens, the hand pressure gauge can be placed in the other sleeve of the opposite head of the machine as a supplementary test and if it is the revision or shipment of machines where the pressure gauges are kept, there are two sanitary pressure gauges1, one can be placed in the brake hose of the machine and the other in that of the tender, controlling the difference in vacuum that the three pressure gauges show.
For greater safety, in case there may be some defects in the hand pressure gauges, reverse their placement so that, if there is an obstruction in the brake pipe, the pressure gauge placed on the defective part, either on the machine or on the tender, will always show less vacuum.
While these tests are being carried out, it is strictly forbidden for the driver to make use of the large ejector, since it could impair the role of the wagon inspector, causing him to act under an erroneous basis.
If the test with the perforated plate is not able to sustain a firm 17-inch vacuum, this indicates that the machine brake is not working properly, in which case the machinist should immediately initiate a thorough check on all brake parts. .
It may happen that small foreign matters are deposited or adhered to the cones or nozzles of the combined ejector, in which case it will be necessary to clean both pieces, taking care not to alter their shapes and dimensions if the material is scraped.
Externally the sector must be kept clean, but it is advisable not to rub with oil because this facilitates the adherence of dust and other dirt that agglutinated form crust, obstructing the air inlet holes of the distributor disk.
Even though the existence of concentric cones is disappearing, there are still devices with cones of this type in service, which are the ones that require the greatest care for their disamantling and cleaning, so that when there is a need to examine to clean those of this type, at the beginning of the operation first extracting the small cone and once it has been cleaned before placing it, taking care to protect yourself from the escape of steam, it is advisable to open the steam stopcock of the small cone in order to discover any foreign matter that may exist, then it is placed in its place and the brake is retested and if it gives negative results it is proof that the defect is in the large cone.
At the least it is advisable to examine it, not being necessary to remove the two sets, it is strictly forbidden to remove the large sector when the small one is not in place, ifyou try to remove the small cone first and then the large one separately, you would run a risk that when making an effort to unscrew the latter it will be damaged and deformed; the nut and nozzle preventing this after the placement of the small cone. so that when the machinist has to clean cones of this type, he will first withdraw and clean the small cone and after it is properly placed back in its place, the large one will be extracted and cleaned.
If, when destroying the vacuum, it is noticed that the two needles in the machine's pressure gauge descend,

it is proof that there is an air passage in the vacuum containers or pipes derived from the machine or tender as it can also originate a passage of air by default in the ring rubber cylinder plunger.
Once it is certain that the brake of the machine is in good condition, the brake test on the train must be started immediately, carrying out a joint review, corresponding to the wagon inspectors, when there are no superior technical personnel, the Direction of this operation, the guards and maneuvering personnel having to provide help, distributing the personnel on both sides of the train so that each one can closely observe the brake cylinders, their hoses, valves, etc., etc. 9 pieces that are placed next to one of the sides of the vehicle.
In this first check it must be observed that the brake cylinders remain properly relieved, proceeding to release those that were not, pulling the wire belonging to the loosening valve.
When reaching the head ends between two wagons, they should approach the coupling sleeves and observe it, starting with the hoop, sleeve, coupling nozzles and ovals, taking care that there is no bending or slack in the latter, that all joints and couplings They offer hermetic joints and when the air passage is noticed, the reason must be duly specified, changing the pieces that were necessary either sleeves or ovals or disabling the brake cylinder when the case requires it.
If a positive result is not obtained in this first test, the section train test should be started as described in “The role of the wagon inspector”.
In the places where there are wagon inspectors, it will be their responsibility to organize the inspection of the train and carry out the necessary repairs, the guards and shunting personnel being obliged to assist them.
When the engineer locates a defective vehicle and cannot specify the defect it has, he must ask the guard to consult the station in order to see if it is possible to remove said vehicle from the train, with the understanding that this procedure must be done only when the driver does not find the defect or does not have the means to repair it.
If instead of one there were several defective vehicles, the train driver must also report the case to the guard who will consult the station which, in turn, after consulting the Train Comptroller Office, will say whether or not the wagons can be removed from the train and if there is an order to make them continue, proceed in accordance with the provisions of Article No. 286 of the General Regulations, for which purpose it is transcribed.

A COPY OF ARTICLE 286 OF THE REGULATION
Verification of the State of the Automatic Brake before leaving the train. -
Each train must be coupled at least 5 minutes before the departure time, in order to allow the driver to test the state of the brake.
Not being possible to create the minimum vacuum of 15 inches in the van and 17 inches in the machine, in accordance with the provisions of articles 280 and 281 of the General Regulations, respectively, the existing defect must be located to correct it, if possible, either eliminating or isolating the defective vehicle so that it does not influence the general vacuum of the train's main pipe.
In the event that neither one thing nor the other is obtained, the defective vehicle must be removed from the train and left at the station to be attended to by the competent personnel. -
If, for special reasons, it is essential that the affected vehicle continue on the same train and the defect still persists, it must be coupled last in the convoy, immediately ahead of the caboose, giving these two vehicles without engaging the automatic brake hoses. with the rest of the train. This procedure will only be allowed on trains that do not carry passengers and the guard must always travel in the caboose to apply the handbrake in case of emergency.
It is strictly prohibited to add more than one vehicle with defective brake to each train under the exposed conditions and in all cases the train must carry at least 50% of vehicles equipped with a brake cylinder as prescribed in Article 43 of the Regulations.
In cases where the difficulty in creating the regulatory vacuum is due to a defect in the locomotive apparatus and if it is not possible to repair it, the train may be driven to its destination or to the point where the

locomotive is changed under the control of handbrakes only, the driver must take the greatest precautions and the guard must be alert to apply the handbrake as soon as the driver indicates it by means of the whistle.
When the procedure determined in the fourth paragraph of this "Substitution" is applied, the guard will be exempted from doing the automatic brake test provided in the third paragraph of the Substitution of Art. 280 of the Regulation, but instead will have the obligation to verify personally what the sleeve of the last coupled vehicle is under the action of the automatic brake.
When in a station where there is no wagon inspector a train could not obtain the regulatory vacuum, due to defect or breakage of a part of the brake that would have to be changed to repair it, the driver must ask the guard to request authorization from the station to remove 11 na part of the vehicles deposited there in order to change the defective one.
The station will indicate to which vehicle the requested part can be removed and the driver must write it down in his travel book, to inform about it.
When the engineer is consulted by a guard or station regarding defects in the brake of a vehicle, whether or not it belongs to his train, he must do everything possible so that said vehicle is repaired, even if it is provisional.
In the case of mixed or passenger trains, the guard should check inside the cars to make sure of the state of the emergency valves, however, the engineer must keep this in mind in case the guard forgets it; corresponding to this the uselessness of said valves when they show a defect.
All temporary repairs carried out by the driver in a running gear, such as: brake pipes clogged with soap, patched coupling sleeves, unused cylinders, etc, etc., must be notified to the guard on the spot so that he can report the case.
The driver who does not make the aforementioned reports will be responsible for the disturbances that the (lack of) repair of the defect could cause in other trains.
A similar report must be made by the driver at the first check of wagons where he arrives and in case of being relieved during the journey, he must transmit the report to the relevant driver so that he can proceed accordingly.
These complaints must be inserted in the driver's daily report, citing the number of vehicles, defective part, repair carried out and if he continued the trip or (if) there was a need to leave the vehicle.
In the same way, the driver must record in the daily report any defect that is registered in the brake of the locomotive.

How to disable automatic brake cylinders.
Before disabling a brake cylinder, the driver must first ascertain what the defect is in order to be able to specify it in his daily report.
In the case of jammed cylinders, in no case should they be disabled without having first tried to bleed them by hand, opening the release valve, and if possible even making it work by means of different brake applications.
To disable a cylinder, the "English" key must be used, imprisoning the band of the sleeve at the end corresponding to the brake pipe and once the key is well tightened to the band, make a to-and-fro movement, as if to move the band and the sleeve. in order to detach it from the pipe until it is separated, then placing a plug or spike in the brake hose, adjusting it well until preventing the slightest air entry.
If the stopper is at hand to cover the straw, the operation of rendering a cylinder useless, in the aforementioned manner, cannot demand a time greater than 5 minutes.
In no case should a blind gasket be used between the valve and the cylinder cover to render the latter useless, as this practice is inconvenient not only because it may go unnoticed by wagon inspectors, but also because in most cases it does not nullify the existing defect, thus resulting in a trap for the machinists, since a large part of the brake cylinder defects is due to the passage of air due to defects in the valve diaphragm and if in these cases one proceeds to disable the cylinder by means of the aforementioned blind joint, the

existing loss would not be annulled in the slightest, which would continue to impair the maintenance of the vacuum, despite having the cylinder disabled.
The aforementioned blind gasket can nullify existing defects inside the cylinder and in the stem press rubber, but in no way can it nullify existing defects or leaks in the valves.
In the case of wedged cylinders, and the plunger offers difficulty in descending, once the loosening valve is open and the cylinder is rendered useless, force can be applied with a bar or wooden brace on the arm of the brake, until the plunger descends, taking care not to crush or touch the stem.
There are usually cases in which, due to a break in the rubber ring of the piston, it jams in such a way that it is not possible to make it descend, making it necessary then to remove the bolt that connects the rod to the brake arm in order to avoid, not only, that the brake pads apply pressure to the tires but also so as not to disable the action of the handbrake.
When this disengagement is made, the brake arm must be wired to prevent excessive lowering which could cause it to rub on the ground. And the cylinder must also be isolated in order to prevent it from subsequently suffering damage.
In all cases of wagons that are braked, the driver must specify the reason, always being aware that the difference in pressure in both stops of the piston can cause braking, not forgetting that this braking can also depend on the tightening of the brake by hand.
It is strictly prohibited to cut the coupling sleeves to render cylinders useless.
When, despite having a vehicle with a loose handbrake and the cylinder fully released, it is observed that the brake pads put pressure on the tires, it is probably an excessive adjustment of the brake, in which case the driver must loosen the nuts of the adjusting bars, enough to avoid the pressure or ce of the shoes, without excessively loosening said nuts in order not to nullify the action of the brake.
Whenever breakage or detachment of brake parts occurs during travel, and there is a need to secure them with wire, hold them with the same hangers or supports, or disassemble parts to remove them, it is the driver's obligation to render the brake cylinder useless, in order to avoid the operation of faulty parts that could become detached.

Use of the automatic brake. -
Except in urgent or dangerous cases, the driver must not apply the brake abruptly, but must use it moderately, using the auxiliary brake application valve, so that when the train comes to a complete stop, it can be restored. the vacuum. In this way, not only will the train come to a smooth stop, but it will make it ready to start the journey immediately without having to resort to the large ejector.
In this regard, transcribe Article No. 276 of the General Regulation:
Art. 276. "How to apply the brake" When it is necessary to use the automatic vacuum brake for the ordinary stop of the trains, the driver must open the air valve of the locomotive, but must do so gradually and never suddenly and with full force (except in cases of urgent distress) having to restore the vacuum by exhausting the air slowly during the time that the train comes to a standstill in order to avoid the backing of the carriages and to allow the driver to start his train again immediately after to receive the signal to do so.
According to this, at the complete stop of any train, the vacuum must be reestablished so that at the moment of stopping the pressure gauge shows at least 10 inches of vacuum.
In cases where it is necessary to use the large ejector to restore the vacuum and hastily loosen the brake shoes on the train, the engineer must be very careful that the vacuum does not rise to a higher degree than the small ejector can maintain. . If the vacuum, with the use of the large ejector, rises to more than that maintained by the small ejector and produces uneven pressure between the upper and lower part of the brake cylinder pistons, causing the piston to rise somewhat, causing braking, being necessary, to avoid this, vent the cylinders by hand.
When inexperienced drivers notice this braking, they usually attribute it to defects in the brake cylinders of the vehicles, when in reality the origin of this braking is due to bad maneuvres carried out on the brake from

the machine.
Due to this mismanagement of the brakes, it is received that there are sudden stops and starts of the trains and to avoid this it is necessary to take special care that the vacuum is restored in the pressure gauge when the train stops» and to avoid the need to resorting to abrupt applications» destroying all the vacuum it is necessary for the trains to enter the stations with a moderate speed» since it has been possible to verify that stopping in the mentioned way does not originate in the train shaking of importance.
As for the suddenness in the start of the trains, it is due to the lack of partial relief of the brake cylinders, frequently causing breakage of the coupling parts of the vehicles, especially in long trains» because when the trains between stopping stop momentarily the regulator is opened when the vacuum has not yet risen to the degree that was sustained in the journey.
Before putting the train in motion, it is not only convenient to obtain the degree of vacuum destroyed, but also to wait a moment in order to obtain a total relief in all the cylinders of the train.
The handling or application of the automatic brake in short trains is extremely easy because its action is partial, since the air is introduced into the general pipe not only through the apparatus of the machine but also through the valve of the van and even when the The train driver braked somewhat abruptly, the trailing vehicles did not suffer major backlash, since the application of the brake was energetic both at the head and tail of the train.
The same does not happen in long trains, where the action of the brake ceases to be partial because the air enters the main pipe solely through the apparatus of the machine, reaching the tail of the train so moderately that it partially destroys the vacuum in the container of the van's valve, canceling the operation of this valve. For this reason, in no normal case, should the brake be applied abruptly, totally destroying the vacuum.
The abrupt application of the brake will cause a strong braking in the vehicles close to the machine while those placed between the middle and the tail of the train will only receive a soft braking, giving rise to this rear part of the train putting strong pressure on the vehicle. the front part. This pressure originates the total compression of the spirals or stop elastics of the vehicles placed in the rear part of the train, a compression that cannot be sustained due to the lack of energetic restraint, immediately starting the depression of said elastics, causing the vehicles of tail back violently 1, 2 or 3 meters, thus causing a sudden forward and backward movement at the rear of the train.
In the case of long trains, the most appropriate way to stop them is by applying the first strong brake, suddenly destroying about 10 inches of vacuum, so that this has an effect on the entire train equally and then, being semi-braked, you can take the lever of the large ejector to its middle position, activated with the auxiliary valve to apply the brake, a matter of slowing down and restoring the vacuum so that when the train comes to a complete stop, the pressure gauge shows at least 10 inches of vacuum.
The abrupt handling of the brake is the one that generally causes breakage, in spirals, wedges, hooks, couplings and hitch bars, crossing or assembly of stop, also harming the treasury enormously when it comes to these trains giving rise to serious protests on the part of of the drivers of the treasury, to avoid these setbacks the use of the brake must be carried out extremely moderately and even when the train driver has controlled the speed of his train even when he goes between stops he should not normally destroy the vacuum abruptly do or rather he must graduate the stop of the train in order to always maintain 10 inches of vacuum, with this you will obtain a soft stop.
In brake applications, a bad practice on the part of some train drivers is usually observed, which consists in that after entering the train at a station when it continues to move slowly, the brake is usually applied, destroying the vacuum abruptly, because a station pawn from the platform He has made signs to stop due to secondary consequences such as loading packages in a certain wagon or van, etc. For this reason, when a train driver observes that the entrance of a train to a station is governed by hand signals, he must put it in a position to be able to stop when requested without having to resort to sudden cooling, as has already been said, it causes contraction in the upper part. rear of the train giving rise to breakdowns or referred crossings.
When a train is about to stop at a station or at the moment of stopping, it receives signals to continue

advancing for the secondary convenience of the station to load or lower points, for example, the engineer should not open the regulator until the vacuum in the brake is left. fully restored and it is still worth waiting a moment to get a partial brake release on the train.
In these cases of immediate stops and starts, the bad practices used by some drivers in April should be completely abolished at the same time regulating and passing steam through the large sector in order to gradually restore the vacuum while trying to move the engine forward or backward. train this bad practice tends to cause breakages in parts of the couplers when the train is advanced and crossed or assembling stops and back.
Variation of the vacuum in the automatic brake. The variation of the vacuum in the automatic brake establishes different pressures between the upper and lower parts of the pistons of the brake cylinders, this inequality being able to cause depressions, an original confrontation that, even when it is carried out with energy, except for excessive differences, enough to interrupt the smooth running of a train. and to command a useful consumption of steam and consequently of water and fuel, since the smooth cooling that occurs when the train departs tends to be accentuated at times due to the fact that the rubbing of the brake pads against the rims of the wheels causes the heating of this material which, as it expands, increases the degree of braking, requiring the locomotive to exert more effort than that required by the weight of the train.
It has been possible to verify that this defect has been a factor in many cases for one to ascend a slope and have had to cut between stations to be able to carry the train in sections and even when the weight of the train was far from reaching the maximum drag weight. stipulated for the locomotive, the engineers try to justify these stops and cuts made by attributing heavy trains and even though this is an erroneous excuse, the train is really heavy, not because of its own weight, but because it is heavy in drag because it runs carrying the vehicles that are braked. . Due to this circumstance, it should never be established with the large effector emptier than the child can hold.
Variation of the vacuum in the brake can also be caused when, for any reason, in a machine equipped with sector c, the pressure of the locomotive's boiler suffers a decrease of some consideration, in this case it will also decrease to vacuum and consequently the command cooling will start. to the locomotive greater effort precisely at the instant that it suffers exhaustion due to a drop in pressure.
It can also make it difficult to restore the destroyed vacuum, when the locomotive's boiler is excessively filled with water due to staff negligence, causing the passage of steam and water through the cones preventing the proper removal of air from the pipe.
When in a train (especially in the case of long trains) for whatever reason it is not possible to get the vacuum in the brake to rise and hold firmly at 17 inches», the drivermust pay special attention to the variation of steam that occurs when in the trains stations have to carry out shunting with a small number of vehicles coupled to the loco, it being very probable that in this maneuvre the vacuum can rise up to 22 inches, then when coupling the train again the vacuum will drop to its original state», thus leaving 5 or 6 inches of tight brake in all the brake cylinders of the vehicles that maneuvered coupled to the machine.
When noticing these cases of vacuum variation, it is the duty of the driver to call attention by means of the whistle to warn the train guard or crewman to proceed to release the brake cylinders by hand, pulling the wire of the slackening valve. of all those vehicles that maneuvered with the brake coupled to the machine
It is the duty of the guard or shunters to pay special attention to the indications they receive from the drivers in this regard, denouncing to them any difficulty that is observed in the relief of the cylinders.
When changing machines on a train, it will not be possible to be sure about the degree of ford in the brake that the other locomotive marked, it will correspond to the guard, in this case, by complying with what is stated in articles numbers 73 and 280 and circular of Superintendence of Traffic No. 1616, observe that all the brake cylinders are fully relieved by making those that are not relieved and if in this operation they notice any difficulty, they must report the case to the driver who is obliged to attend to it.
Cuando en este caso, el maquinista observa que el guarda no cumple lo referido, debe llamarle la atención por «e dio del silbato y advertirle al respecto, informando cada vez que note que no se ha cumplido lo

expuesto.
Según lo expuesto en esta parte, la variación más frecuente en el vacío del freno automático puede definirse así:
La variación del vacío en sentido descendente origina en frenamiento del tren, perjudicando no solamente su buena marcha, sino que puede dar lugar a que se originen desperfectos en el material rodante.
Que esta variación, cuando dependa del manejo del apara to de freno de la máquina, se debe a negligencia del maquinista, quien puede evitarla no creando con el eyector grande más vacío que aquel que pueda sostener con el chico.
Esta variación puede evitarse dejando accionar el eyector grande hasta obtener las 17 pulgadas reglamentarias, después debe accionar el eyector chico.
En maniobras el maquinista es el único indicado para notar variación del vacío correspondiente,, por lo tanto reclamar la intervención del guarda o personal de maniobra, para regular la diferencia de presiones en los cilindros de los vehículos que maniobraron acoplados a la máquina.
Que mientras el freno acusa variación del vacío en sentido descendente no debe mover su tren hasta después de restablecer el vacío destruido o haber sido desahogado a mano los cilindros de freno del tren.
Proceder a desacoplar las mangas de freno:
Al efecto transcríbase el Art. 274 del Reglamento:
Artículo 27. “Proceder al desacoplar la manga"
"Al desenganchar la máquina del tren los acopies deben siempre colocarse sobre los soportes provistos para el objeto.
Los vehículos sueltos siempre deben tener los acoples colocados en la misma posición.
Está terminantemente prohibido desacoplar las mangas hasta que .se haya destruido el vacío por medio 3e la válvula de la máquina o furgón.”
En muchas irregularidades del freno automático, se ha podido comprobar que son originadas por negligencia del personal de Tráfico al desacoplar las mangas de freno sin antes haber destruido el vacío, lo cual trae como consecuencia la introducción de cuerpos extraños, cómo ser estopa y hasta los propios ovalillos arrancados de su sitio. Esto ya sea en máquina o vehículo, perjudica el buen funciona - miento de distintas piezas del freno.
Esté proceder constituye una seria irregularidad y una grave infracción al mencionado artículo 274, por cuyo motivo es deber del maquinista informar con todos los detalles posibles todo acto en que los encargados de desacoplar vehículos lo hagan sin antes haber destruido el vacío en el freno.
Se advierte a los maquinistas, que el*personal de tráfico ha sido advertido que le queda terminantemente prohibido llevar estopa en las manos en horas de servicio, especialmente cuando efectúen desacoplamientos o acoplamientos de mangas de freno ya sea de máquinas o vagones, estando el vacío formado.
Queda completamente prohibido el uso de estopa a todo personal que efectúe revisación, reparación, limpiezas u otras operaciones en freno automático; como ser limpiadores de máquinas, aprontadóres, ajustadores de las remesas, maquinistas, foguistas, etc., etc., no admitiendo en ningún caso que el maquinista lleve estopa en la mano cuando efectúe manejo del freno.
Al detenerse el tren en una estación o al efectuar maniobras con el freno automático acoplado, es deber del maquinista prestar especial atención a fin de destruir el vacío si le fuera solicitado para evitar que se efectúe desacoplamiento sin destruir el vacío, lo que originaría el arranque de los ovalillos de su respectivo sitio.
Aun cuando la destrucción del vacío puede efectuarse des de la válvula del furgón, el maquinista debe estar siempre atento e informar cuando note que se efectúe desacopla miento sin destruir antes el vacío.
De igual modo debe informarse cuando durante el periodo de maniobra se observe que se efectúe acoplamiento de freno automático, antes de estar los vehículos definitivamente enganchados al tren, para cuyo fin se transcribe el artículo 282 del Reglamento General.
Artículo 282. 'Proceder al agregar o sacar vehículos1.1
En cualquier estación donde haya que agregar o dejar vehículos el maquinista tiene que destruir el vació

aplicando la válvula de aire del eyector.
Después de haber cortado la máquina de su tren para sacar vehículos de un desvío y agregarlos al tren, no se debe acoplar las mangas del freno hasta que el tren esté formado otra vez en la vía principal".
Cuando por cualquier circunstancia tenga el maquinista que desacoplar la máquina del tren, o cortar parte del tren, no deberá hacerlo sin antes haber dado aviso al guarda a fin de que éste tome medidas de seguridad aplicando los frenos a mano según lo requiere el articulo N° 284 - del Reglamento citado en "El cometido del guarda tren"
Con respecto al desacoplamiento de vehículos, cuando por cualquier motivo, esto suceda en viaje, el maquinista al notar descenso del vacío en el freno no debe obstinarse en restablecerlo, empleando el eyector grande, sino que debe tratar de inmediato de observar lo que sucede dejando detenerse el tren, dado que ha debido existir una causa especial para que el aire haya podido penetrar en la cañería. En viaje, dentro de lo normal, no hay motivo para que el maquinista tenga que recurrir al eyector grande para poder sostener el vacío, de modo que * cuando se observe el descenso de éste, debe ser una llamada de alarma al maquinista quien debe prestar atención al tren.
Acoplamiento del freno automático. - Cuando haya que efectuar maniobras en desvíos de balaceras canteras como ser en canteras de Verdum, cufré, balasteras de piedra y análogas y en todos aquellos desvíos donde existan pendientes fuertes se le prohíbe terminantemente al maquinista poner su máquina de movimiento sin antes haber recibido del guarda seguridad de que el freno automático en el tren o corte de vagones está debidamente acoplado, pues de lo contrario la rotura de una pieza de los enganches puede dar lugar a que quede sin gobierno un corte o tren originándose un grave accidente.
Cuando en una estación haya necesidad de efectuar maniobras con corte de vagones largos y pesados en los cuales forman tanques con petróleo vagones cargados con piedras, materiales de vías, cargas pesadas siempre que el maquinista lo estime conveniente para el gobierno de la maniobra puede pedir que se efectúe el acoplamiento del freno automático a fin de asegurar un movimiento moderado.
Distinto uso del freno durante el viaje. el empleo del freno cuando el tren de 100 de una pendiente debe efectuarse moderadamente y regulada a fin de no dejar tomar el tren más velocidad que la deseada empleándose la válvula auxiliar de aplicación del freno según el caso lo requiere quedando siempre en condiciones de restablecer el vacío inmediato.
Al descender una pendiente no es conveniente dejar que el tren corra por su propio peso con freno libre para después frenar enérgicamente pues esto puede originar separación en algunas juntas de las mangas de frenos. debe aplicarse el freno moderadamente hasta detener el tren en las pendientes en enfrentamiento debe iniciarse desde el principio de acuerdo con las velocidades estipuladas. véase artículo número 279 de reglamento general
Artículo 279 uso del freno en pendientes. Al bajar pendientes el maquinista de hacer uso del freno automático para reducir la velocidad cuando sea necesario con preferencia hacer uso del freno ordinario de manos. al entrar un tren estaciones terminales o desvíos ocupados el maquinista debe reducir la velocidad de su tren dominando la por completo a fin de poder parar con el uso del freno de la máquina solamente sin emplear el freno automático según lo exige el artículo 285 del reglamento general.
Artículo 285 precauciones al llegar a estaciones terminales o estaciones de cruces. Al aproximarse estaciones terminales y estaciones donde otro tren está parado sobre la misma vía no se debe usar el freno automático si no en caso de emergencia.
The driver must reduce the speed of his train in such a way that he can stop with the handbrake only.
When a train enters any terminus, guards should be ready to apply the brake by hand if necessary, not leaving their post until the train has stopped.
In all cases of applying the brake to avoid a personal accident or when you have finished stopping the train because of it before starting the trip, it is necessary for the train drivers to complete the following requirements, noting them in their daily part with the greatest care.
1° The degree of vacuum registered by the manometer before applying the brake.

2° Once the brake has been applied, leaving the ejector lever in the brake tight position, the driver must immediately check the train and note the number of all those vehicles that do not keep the piston in the brake tight position and after five minutes have elapsed. a second inspection and write down the number of all the vehicles whose cylinders have drained on their own, taking care of other people do not pull the valve wire loosening
3° This test should be carried out in the same place of the accident, the cost is provided for in paragraph 2, but in special cases it can be left to do it in the first station that is deemed appropriate, provided that this test is carried out before modifying the formation that the train retained at the time of the accident.

Attention of the automatic brake in trains of Tracks and Works.
When track and works trains work between stations where there are no wagon inspectors, it is up to the driver to take care of the brake throughout the train, ensuring that all its parts work properly, changing defective parts or disabling cylinders when the case requires it.
When the driver has had to carry out temporary repairs on the vehicles, such as covering brake pipes, disabling cylinders, etc., he must indicate the need to change the vehicle on some day, and it is up to the guard to pass the respective notice on the reported defect in accordance with the circular of the Superintendency of Traffic W.9/11» dated 6-12-22 whose content is transcribed in the "The role of the train guard".
In turn, the station will proceed to comply with what is stated in circular of the same Superintendency No. 2,800, which also transcribes the "The role of the train guard" so that the defective wagon is attended by competent personnel from the Engineer's department Mechanic, before going on to serve Traffic,
In the event of vehicle brake failures, when the driver is not sure how to proceed in accordance with what is indicated in paragraph number 2 of this chapter, he can request the intervention of a wagon inspector, but in the well understood that this will be done cynically in case of importance, when the driver is not qualified to decide on the matter.
In the event that the driver needed spare parts, such as brake hoses, ovals, etc. (You must request it from your respective consignment and if you tried to check the wagons if it was closer.
The train driver must note in his daily report all the attention he pays to the vehicles, citing the number, date, defect and repair carried out, if it is still in service or the guard was asked to remove it from the train and if it is noticed that the guard did not complies with your request, it must be reported immediately.
Any attention of the drivers to the trains of Vía y Obras does not at all exempt the responsibility that falls to the guard in the attention of these trains, who is obliged to comply with what is stated in article No. 73 of the General Regulations.

Defects observed in the brake. -
Every driver is obliged to report in his daily report, or to the station or guard, as the case may be, any defect that he notices in the brake, either on his machine or on the train, so that said defects are not assumed. larger proportions and may affect the running of other trains. For this purpose, the notice issued by the Traction Office dated 11-14-19 is hereby submitted.
Some drivers have recently entered in the corresponding consignment book defects that they have noticed in the brake apparatus of the machine, when such defects have assumed truly serious proportions, it is made clear to them that, from now on, whatever the magnitude of the noted defect, they must make the corresponding note as soon as possible, so that they can then proceed immediately to review the device and repair the defect.
It is understood that in a similar way they must report defects noted in the brakes of the vehicles that make up the train, while reporting these defects in the first inspection of wagons where they arrive so that they can be attended to immediately.

Upon the arrival of trains at points where there are wagon inspectors, the driver is obliged to give them all kinds of reports regarding the operation of the brake, citing the inches of vacuum registered on the manometer during the trip, whether or not there was difficulty in hold the gap and if so, it must specify from which point said defect was noticed, so that the inspector can control the defective vehicle, taking into account the vehicles taken at said points.
When a driver, while traveling, notices difficulty in maintaining the vacuum, he must take advantage of every opportunity that arises in order to be able to locate the defect, checking the train when it suffers delays waiting for crossings, free track or other causes, while the guard required to cooperate.
Any deficient coupling that is noticed on the train, the guard is responsible and it is to him that the driver must address.
When the driver wants to have the train with the brake tight, because it is convenient for good service, after having lowered the large ejector lever to the "brake tight" position11, he will raise it to its middle position and close the small ejector.
Once the steam stopcock to the combined ejector is closed and the steam stopcock to the small ejector is closed, to loosen the loco brake, the air inlet valve or valve must be opened at the top of the cylinders .

Modification to article 257 of the general employment regulations
Double traction. - In cases where it is necessary to use two machines on the same train, they will be at the front of the train, with the exception of helping to climb a steep gradient in which case one can be attached to the tail.
The driver who leads will be responsible for the general driving of the train, that is, he will give the regulatory exit signals, observe the semaphore and other fixed signals, control the operation of the brake and in any case he will be solely responsible for being equipped with the *via libre* ticket. However, it will be the duty of the personnel of the second machine to observe that all the signals are properly displayed and interpreted and in case of emergency to use the automatic brake.
The driver who goes behind will obey and respond to the signals of the one who goes ahead and in no way can the one who goes behind have the regulator open, when the one in front has it closed.
Every train that runs with two coupled machines and when they have to take water in any of the tanks of the line, must stop the train a short distance from the tank and before taking water, the machines must be uncoupled from the train by the guard or by the station laborer, as the case may be, the train staff being obliged to secure the train with the brakes by hand and with chocks if necessary, as well as to protect it with the corresponding signals if necessary.
It is recommended that maneouvering with coupled machines be avoided as much as possible, uncoupling one and leaving it on a siding while maneouvring with the other.

Addition to article 257 of the general regulations
Double Traction Trains – Each fireman will have the obligation to give water to their respective machine. When the tank is located between stations, it is up to the fireman of the second locomotive to cut these from the convoy and reattach them, after they have been supplied with water.
Before proceeding to uncouple the engines, the fireman must wait for the guard to destroy the vacuum, from the van, as an indication that the regulatory precautionary measures were taken.
Handlng the locomotive – In the second part of this manual it has been explained how the machine works expansively and therefore economically.
Now it is necessary for the machinist to always keep this in mind: He should always work with the regulator as far open as possible and the reverser as retracted as possible.
Having the regulator open as much as possible ensures that there is no restriction in the passage of steam from the cone to the cylinder and therefore the initial pressure of the same in the cylinder will be high and as a result the resulting power will be greater than the same amount of steam. .

The same happens with the reverser in that when having it raised the valves close the inlet of steam in each stroke of the piston earlier and then it saves steam by working it expansively and as a result fuel is saved.
On the care of the water and level in the boiler this has already been discussed so that it is not necessary to repeat it.
Lubrication care – The system of lubrication has been explained and it has been well established that the driver is responsible for the good lubrication of the machine in all its parts and that he can be assisted by the fireman under his care.
a) Axleboxes and (couplings?) – As the lubrication of these is automatic, the duty of the driver is to make sure that the mechanical lubricator is always filled with oil and that the pump works properly by testing the test taps every trip.
He must feel the hub of the wheels and if there is the slightest excess of temperature, feel the crown and try to find out the cause of the onset of overheating.
On machines with newly turned rims, it is common to find a bearing running hot against the hub, not the crown. This is because the diameter of the wheel is slightly larger and the wheel is pulled inward to match the opposite wheel. In these cases, by oiling between the hub and the wheel, it is possible to prevent the fever from exceeding the normal limits,
Another common cause of overheating is bitten by (?) and here the only remedy is to catch it in time – and place the candles of grease to continue to the destination and if the overheating is not enough with – change the(?) will be fixed.
In service where it is possible to check every so often, a box should never heat up to the extreme of having to leave the train.
They also cause overheating, from boxes the earth and sand and it is. It is necessary to monitor this point in connection with the arrival of sandbox deposits.
b) Connecting rods, bolts, etc – On the Central Railway there is little difficulty with connecting rods, bolts, etc. The eccentrics in intside valve gear machines have given some difficulties in previous years, especially with flat valve machines.
However, today with better lubrication this difficulty has disappeared.
Not for that reason, the staff is exempted from a review at each water intake.
c) Valves and pistons. Most of the machines being lubricated, with mechanical lubricators, the concern of the crew is to make sure that the material is not missing. It is also very necessary that the anti-carbonizing valve be tested every trip, in general be attentive to the softness of the lever and the presentation of the piston rod. A smooth lever and a clean stem are evidence of good lubrication. –
In the case of sight lubricators, it must be ensured that the drippers are working normally and in accordance with the service requirements.

Fourth part – DESCOMPOSTURAS
Question no. 1. What indication does the water level give when the upper tap is clogged?
Answer: it indicates more water than you actually have in the boiler.
Question no. 2. What should the driver do to note this defect?
Answer: you must dispense with the use of this by closing until the obstruction is eliminated because the lack of level indication can cause serious damage to the boiler due to lack of water.
Question no. 3. If he breaks the tubes of the water levels and does not having a spare to replace them, how can the driver know if he has water in the boiler?
Answer: You can easily find out by loosening the gland of the regulator and bringing the water level more or less to that height
Question no. 4. What is the deflector for on a coal-burning engine?
Answer: the deflector is to prevent air from entering the firebox while the door is open during the feeding of the fire.

Question no. 5. What should the driver do when a boiler tube breaks?
Answers: put out the fire, turn the injectors on and order another locomotive.
Question no. 6: what are the main causes that prevent the operation of the injectors?
Answers: there are different factors that prevent the operation of an injector, such as insufficient water in the injector, obstruction in the tank valve or in the sleeve strainer, loose or obstructed convergent cone, sleeve bent or preventing the flow of water, hot injector body either due to loss of steam intake or introduction valve, introduction valve with little inlet.
Question no. 7. What should the driver do if the injectors do not work?
Answer: the first thing you should do is make sure that the tank contains water and then see that it has reached the injector freely, by not reaching that point there is probably an obstruction, either the tank valve or sleeve strainer. The latter being removed and cleaned and if the defect is in the tank valve, steam is passed to this point, for this the discharge pipe is covered and the valve taken from the injector is opened. that way he goes because the tank dislodges any obstacle that is in the valve. On the other hand, if the defect is caused by dirt on the injector cone, it is cleaned with a thick wire rod that is inserted into the cone by removing the registration plug that the injectors are provided for that purpose. If the problem is caused by heating the injector due to losses in the steam intake and introduction valve, in the first case it is cooled down by letting the water run through the discharge pipe or it revokes daireaux and in the second case the male of the introduction valve, but in the case of having exhausted all the resources and having failed to make either of the two injectors work and therefore in the impossibility of being able to supply the boiler, the fire must be extinguished.
Question no. 8: Breaking the steam intake pipe of the regulator (?) valve, what should the driver do to avoid overheating of the elements?
Answer: You can continue your service without difficulty by closing the valve if possible.
Question no. 9: What should you do when a spring breaks?
Answer: If it is partial breakage then the leaves can be secured with a clamp, we proceed to do this with a clamp that the machines are provided with.
If the breakage is general, the (axle)box is fitted with the wooden blocks that the machines have, but in the absence of these, blocks must be improvised.
Question no. 10: Breaking a combined spring, what should be done?
Answer: The procedure is the same as with non-combined spring, but it is also necessary to wedge the combined box with the broken spring.
Question no. 11: Breaking an spring hanger or a compensating lever, what should be done?
Answer: The box is shimmed in the same way as in spring breaks.
Question no. 12: What precaution should be taken when having to wedge the boxes due to damage to the spring hangers or rocker arms?
Answer: When having to fit boxes, it should be observed that they keep the height of the others so that the weight does not suffer variation, because if any of the boxes is overloaded with weight, it is exposed to heating.
Question no. 13: Breaking the driving axle, what should be done?
Answer: By breaking the driving axle, the machine is unable to run by its own means, therefore, the fire must be extinguished. Then dismantle the necessary rods to leave the faulty axle independent in order to make the machine ready to be towed. Once the dismantling is done, the machine is raised a little by means of the jacks and the axle-boxes of the non-damaged axles are shimmed from the top and the springs are removed from the broken axle. Then by means of a jack lift the broken axle until the boxes touch the top of the frame. If the breakage has occurred in any of the boxes and therefore it is not possible to lift that part with a jack, proceed as follows: The machine is lifted, two wooden blocks are placed between the rail and the wheel of the broken axle; then the machine is lowered, and the wheels of the damaged axle resting on the blocks, bring the boxes to touch with the crown on the frame.

Once this operation is finished, a wedge is placed between the axleboxes and the guide tie of the damaged shaft so that it remains suspended.
If it is a type of machine that the wheels exceed the frame, as a safety measure, the dust guards are removed from the wheels of the damaged axle and a cross is placed between them and the frame, and the brake shoes must be removed from these wheels.
Question no. 14: Breaking the rim of a driving wheel, what should be done?
Answer: In this case, proceed the same way as in the breakage of a driving axle. If it is a simple break without missing a piece of tyre, you can continue until the next station and to a nearby engine shed, (moving the loco) on its own with caution.
Question no. 15: Breaking a coupled axle what should be done?
Answer: The connecting rods on both sides corresponding to that axle are dismantled, leaving it independent, lift it up and secure the axle in the same way as explained about the breakage of a driving axle. Once this operation is done, the machine is ready to continue on its own.
Question no.16: Breaking the rim of a coupled wheel, what should be done?
Answer: Proceed in the same way as explained about a coupled axle breakage.
Question no.17: Breaking a bolt of the central coupling bar between the engine and tender, what should be done?
Answer: In this case, not having anything else at hand, the bolt is replaced with a pinch bar with which all machines are provided.
Question no.18: Breaking the drawbar between the machine and the tender, what should be done?
Answer: The broken bar must be removed, and a chain must be placed in its place doubled several times, in addition, in the case of heavy trains, the weight must be reduced, and the driver will try to avoid jerks when starting and running.
When reaching a point where it is convenient to turn the machine, it is advisable to do so, continuing the journey tender first with caution.
Question no. 19: If a machine with a two-axle bogie breaks one of these, what should be done?
Answer: The machine is raised from the front, then a thick wooden block is placed in front of the centre of the bogie on the undamaged axle side, the chock being secured between the bogie table and the floor of the smoke box and taking all the weight.
The front coupled axle boxes are shimmed from the top and then the machine is lowered, leaving the damaged axle suspended so that it does not touch the rail.
Question no. 20: What is the object of the bogie?
Answer: The bogie is to facilitate the passage of the machine through the curves.
Question no. 21: How do you test valves and piston rings to 'know if they are defective?
Answer: Whenever it is necessary to check the condition of the distribution valves and piston rings »the machine should be positioned with the crank and the reverser so that the valve to be tested closes the two ports perfectly. that lead the steam to the cylinder; this is achieved at different points, with the exception of dead spots. But the most suitable and safest position to perform this test is to try one side at a time. Proceed as follows: Place the power crank on the side to be tested at the highest point of the wheel, that is, in a vertical position, the reversing lever is placed in the center of the toothed ark; in this way the cylinder intake ports are closed.
The steam regulator opens, and if steam comes out of the cylinder heads, it is proof that the valve is faulty. To test the piston rings, proceed as follows: With the machine in the same position as before, move the lever either backwards or forwards, the steam regulator is opened when all steam must discharge through the (drain cock?) on the side that is being admitted; If the steam exits via both drain cocks, it shows that the rings are defective, since they allow the steam to pass from one side of the piston to the other. It is also possible that the exhaust is direct to the chimney due to a broken valve ring. This test is applicable to all kinds of valves, be they flat or cylindrical, internal or internal shaft intake and also in three-cylinder

locomotives. When performing these tests the locomotive brake must be applied.
Question no. 22: In case of breakdowns, having to bypass one side of the machine, how is the distribution valve centred?
Answer: If you have to centre a distribution valve and the fault does not allow it to be closed by means of the lever, proceed as follows: the valve is placed all the way forward and the stem is marked next to the gland, then it is pulled back completely, the distance between the gland and the mark made on the stem is taken, taking the midpoint of that distance, the valve is brought forward until that point reaches the gland, in that way the valve is centered, that is, closing the two ports of admission of the cylinder.
The valve is secured by tightening the gland on one side only, leaving it crossed. Being a machine equipped with a valve stem support, it is secured by means of the pressure screw of the stem bearing, for this it is necessary to place a supplement on the tip of the screw, for this purpose a small nut can be used, or any other suitable thing. for supplement. Whenever running with a centered valve, the drain cocks for the affected cylinder should be left open.
Question no. 23 - Breaking an eccentric, what should be done?
Answer: The two collars on the faulty side are dismantled, the distribution valve is centered, the connecting rod is dismantled, the piston is secured back by shimming it with a piece of wood and a flange is placed on the driving axle crankpin. The cylinder drain cocks on that side are left open so that if the valve moves, it is noticed at the first moment by the steam coming out of them and the journey continues with only one side.
Question no. 24: - Breaking a driving axle crankpin, what is to be done? -
Answer: All the connecting rods on the damaged side and the coupling rods on the opposite side are dismantled, the valve puller is dismantled, if it is an inside valve gear machine, the distribution valve is centered, the piston is secured back and the trip continues with just one engine connecting rod.
Question no. 25: Breaking a driven crankpin, what should be done?
Answer: The connecting rod attached to the broken crankpin and the partner on the opposite side are dismantled.
Question no. 26: Breaking a connecting rod or a connecting rod joint, what should be done?
Answer: Proceed in the same way as for a coupled wheel crankpin breakage.
Question: no. 27: Why is it that when one or more coupled connecting rods are dismantled, is it necessary to also remove the ones on the opposite side?
Answer: This is done because the cranks can break or twist when the machine goes through a sharp radius curve or slips.
Question no. 28: Breaking a driving connecting rod, what should be done?
Answer: The valve gearis dismantled if the machine has internal motion, the distribution valve is centered, the faulty connecting rod is removed, the piston is shimmed at the back and it continues with only one side.
Question no. 29: Breaking a piston rod, what should be done?
Answer: The valve (motion) is dismantled, the valve is centered, the driving connecting rod is dismantled and (the engine)continues with only one side. If the breakage has occurred in the keyway of the rod and the front cover of the cylinder has been broken and therefore the piston has moved sufficiently forward leaving the course of the crosshead free, in this case it is not necessary to disassemble the entire connecting rod.
Question no. 30: In the event that due to the nature of a fault, a flat distribution valve cannot be centered, how is it fixed?
Answer: In this case, it is necessary to form a steam chamber, either in the back or in the front part of the cylinder, as the case may be, and for this we proceed as follows: To form a steam chamber in the part at the front of the cylinder, the piston is placed at the back of the (cylinder) and the valve is also placed in that position, in this way the front port remains open admitting steam to the cylinder, as the rear port is closed with the piston, the steam does not have an outlet and consequently the vapour chamber is formed.
If it is necessary to form the vapour chamber at the back of the cylinder, the position of the plunger and the valve is reversed, that is, placing it at the front.

Question no. 31: In the case of a cylindrical internal inlet valve, how is it made to form a vapour chamber?
Answer: In this case the position of the valve must be reversed in relation to the plunger, therefore, if a vapour chamber is formed in the front of the cylinder, the piston is placed back and the valve forward, this position is reversed if the vapour chamber is formed at the back of the cylinder, that is, the piston is placed in the front and the valve in the rear.
Question no. 32: Why is it not possible to form a vapour chamber with the internal inlet cylindrical distribution valves in the same way as with the flat valves?
Answer: This is because they work differently, since the internal intake cylinder valve when it goes forward, opens the port on that side, admitting steam to the cylinder and exhausts back. On the other hand, the flat valve when it goes forward admits steam back and makes the exhaust forward.
Question no. 33: Losing one side of the sector, what should be done?
Answer: Disamantle the valve puller and drive rod, centre the valve, secure the piston back, and continue on one side.
Question no. 34: By breaking the piston itself, what should be done?
Answer: The timing valve puller is dismantled, it is centered, the engine connecting rod is dismantled and the journey continues with only one side (working).
Question no. 35: Breaking an eccentric in three-cylinder locomotives?
Answer: Proceed in the same way as with two-cylinder machines.
Question no. 36: By breaking the loop of the distribution valve, what is done?
Answer: The valve puller is dismantled, it is brought forward completely, the driving connecting rod is dismantled and the piston is placed forward, thus leaving a steam chamber and continuing with a single *castado*.
Question no. 37: Breaking a distribution valve stem inside the box, what is done?
Answer: Dismantling is done in the same way as in valve loop breakage, with the difference that there is no stem left to secure the valve forward, but you can take advantage of the broken stem piece, or you can also ensure the valve by means of a wooden dowel that is passed through the hole of the press and to secure it is tightened with it.
Question no. 38: Breaking the reversing lever or lever bar, what should be done?
Answer: The tops of the bearings are removed from the motion shaft, then a rough insert is placed between them and the shaft. After the shaft is brought to a point where the movement gives an advance to the valve according to the path it has to travel, this can be between three or four teeth or more, depending on the case, the bearing screws are tightened , the axis of movement being secured by means of the supplements.
Question no. 39: If the regulator rod breaks and the valve remains open, what should be done?
Answer: In this case, the running of the machine is controlled by means of the reversing lever. To stop the train, the lever is placed in neutral and the brake is used, but it is always advisable to lower the pressure in the boiler a little when approaching the stations, as the lever is more easily operated.
Question no. 40: By breaking a distribution valve flap, what do you do?
Answer: In this case, it is tested whether the break has occurred in the front or rear flap, proceeding as follows: place the engine crank on the damaged side at the bottom, steam is applied with the brake loose and the reversing lever in neutral; if it is the back flap, the machine moves backwards and if it is the front flap, the machine moves in that direction.
In this kind of breakdown, a vapour chamber must be formed, continuing with only one side.
Question no. 41: Breaking a steam intake pipe, what should be done?
Answer: One of the joints is loosened and by means of a suitable sheet the pipe is rendered useless, leaving the machine in a position to continue with only one side once the driving connecting rod and the valve handle have been dismantled, but generally this will not be possible. Loosen the joint with the loco tools and it will continue to the next station.
Question no. 42: What are the positions that a distribution valve can be centered on the wheel turn?

Answer: The positions where the distribution valve can be centered, that is, the two ports are closed at the same time, not allowing steam to enter the cylinder; There are six of them, namely: The driving crank and the reversing lever are placed in the following positions: crank at the highest or lowest point of the wheel, lever in the neutral position of the toothed arc, crank a quarter up forward, lever back, crank a quarter down back, lever forward. crank a quarter up back, lever back.
In (any of) these positions, the flat valves and the cylindrical valves close.
Question no. 43: Having a continuous passage of steam to the exhaust, being the driving crank and the reversing lever in any position, what does it indicate?
Answer: This shows that the distribution valve has broken and in this case it is necessary to cover the steam inlet pipe in a joint, using for this a sheet of iron or other suitable material. The driving connecting rod and valve puller are dismantled, thus leaving the engine in a position to continue with only one side.
Question no. 44: Why is it that when an engine is dismantled to continue with only one side, the piston is secured with wood and a flange or clamp is attached to the driving crankpin?
Answer: The piston is secured in order to prevent it from causing damage by receiving a blow of steam if the distribution valve is moved from the centre where it is secured. The flange or clamp is attached to the motor crankpin in order tno. 45: How can one locate the breakage of a distribution valve stem inside the steamchest, the valve being flat?
Answer: The driving crank is placed at the highest point of the wheel. The reversing lever is positioned in full forward gear. In this position the valve is admitting steam to the cylinder at the rear. Opening the regulator will show that the steam is discharged from the cylinder vent on that side.
The lever is then placed in full reverse gear; If the stem is broken, the valve does not change position and remains admitting steam to the cylinder always from the back and therefore the steam discharge is done by the same steam trap.
Question no. 46: On an engine with piston valves, how is this test done?
Answer: The machine is placed on the side to be tested with the crank in the same position as in the previous test. The reversing lever is placed in full back gear, that way the valve is admitting steam to the cylinder in the front part. The regulator opens and you will notice that the steam is always discharged from the drain cock at the front of the cylinder. Then the lever is placed in the last reverse gear point (?) and if the stem is broken, you will notice that the steam is always discharged by the same drain cock, since the valve has not changed position when reversing gear.
Question no. 47: If the advance lever of the Walschaerts motion is broken, what should be done?
Answer: In this case, the hanger is disengaged from the radial arm, the distribution valve is centered, the eccentric connecting rod and the motion connecting rod are dismantled and the journey continues with only one side.
Question no. 48: Breaking the eccentric arm of the Walschaerts motion, what should be done?
Answer: I know how to dismantle in the same way as when breaking the advance lever.
Question no. 49: By breaking the link of the advance lever of the Walschaerts motion what is done?
Answer: The same disarmament is done as explained in the previous questions.
Question no. 50: Breaking the piston in a piston valve, what should be done?
Answer: If the break is small and the valve can be centered without losing a lot, it is possible to continue with one side to meet another locomotive.
If the break is large and the loss of steam is important, nothing can be done and you have to wait for a (rescue loco).
Question no. 51: Engaging the connecting bolt of the radial arm with the advance lever of the 'Walschaerts' motion, what should be done?
Answer: In this case, the two pins that secure the bolt must be removed because when it is free it matches at that point.
Question no. 52: How do you know when a piston is loose on the rod?

Answer: The loosening of the piston in the stem is difficult to occur because the nut that secures it has a pin and therefore it has to be broken and then the nut loosens. In the case of loosening, the piston on the stem produces a blow that is very different from the blows produced by the bronzes of cranks, axle boxes, cross-arms, etc., Because due to the conical construction of the stem, the piston produces a blow when the cylinder receives the steam from the back due to the steam hitting the piston against the nut. On the other hand, when the cylinder receives steam from the front, the piston returns to its seat without producing shock due to its conical construction. This defect is located in the following way: It is placed in the locomotive in the test position, piston rings and with the regulator open, the lever is moved back and forth when it will be noticed that when the cylinder receives the steam from the back it produces a blow inside it that is precisely caused by the piston hitting against the nut.

Fifth part

Duties of the driver

The following are unavoidable duties of the driver:

1st – Carefully check all the parts of the locomotive and tender, making sure that they are working properly.

2nd – Make sure that the reported repairs have been carried out and if it is verified that they were not executed, attract the attention of your superior immediately, and he will record the observations in the book before the departure of the locomotive.

3rd – Make sure that the locomotive be provided with sufficient fuel, water and sand, before starting the (allocated) service.

4th – Clean the interior and prepare the locomotive head lamps as well as turn them on and off at sunset and sunrise, respectively.

5th – Write down in the respective book at the end of his working day the necessary repairs to the locomotive he was in charge of.

6th – Sign the register when taking and leaving service, noting the respective time.

7th – As a general rule, give a reasonable advance notice (at least four hours) when, due to illness or serious causes, you cannot undertake your duty, in order to be able to make the necessary arrangements to avoid disruptions at work. . These absences must be duly justified in due course.

8th – In general, outside the shed, give water to the locomotive in your charge.

9th – Help the fireman to raise or lower the buffers.

10th – Deliver to whoever it may concern, at the end of each working day, the details that are required with respect to the service provided.

11th – Clearly answer the service correspondence addressed to him and make prompt reports, especially when it comes to accidents or train delays.

12th – Check that the locomotive has the complete set of tools and accessories and if this is not the case, notify the person in charge of any omissions that you notice.

13th – Upon arrival at the destination and before leaving the service and in cases where he leaves the service in the shed, he will ensure that the fireman keeps the tools and other accessories under lock and key in the locomotive, and must then hand over the keys to the person in charge of the shed in the place designated in advance.

14th – When being relieved in transit, the relieved engineer must deliver to the relevant (person) a note giving the repairs required in the locomotive that he delivers.

15th – The driver must keep a notebook in which he will write down the time of arrival and departure from stations with his train, and any other record related to his service.

16th – Direct and supervise the careful oiling of the locomotive, cooperating with the fireman in this obligation, being responsible for its result.

17th – Since the fireman is an agent who is under the orders of the driver during the service, the latter must make sure that he complies with all his obligations.

18th – He must always make use of the firebox reflector when burning coal; of the discharge taps, and complying with the instructions given in this regard.
19th – Cooperate with the other personnel to turn the locomotive in places where due to lack of traffic or where sufficient personnel can be constantly maintained.
20th – Obey, and abide by the orders and instructions regarding the handling and driving of the locomotive as given by his superiors, who will be responsible for the orders they give.
21st – It is the duty of the drivers to drive their charcoal or wood (-fired) locomotive with the spark arrestor in the smokebox in perfect condition, the ashpan well wet and the back (damper?) closed in summer, for which purpose they must carefully check these elements before leaving the shed, and in the event that he is not satisfied with its condition, will immediately call the attention of the person in charge to the damages found in them and will write them down in the repair book.
If there is grass on the tracks, he should remove it from the wheels and brake shoes of the locomotive, at all points where possible.
When arriving at the destination, it is mandatory to write down the condition of the appliances in the repair book. against fire in the locomotive.

Duties of the fireman
The duties of the fireman are:
1st – Clean and prepare all the lamps of the locomotive, except for the headlamps and the exterior of the side and tail lamps.
2nd – Take care of, store and maintain the tools and other accessories of the locomotive in a clean state.
3rd – Help the driver in the lubrication of the locomotive.
4th – Clean fire, smokebox and ashpan during the trip when necessary.
5th – Keep the front and inside of the locomotive cab in a clean state.
6th – Make sure the locomotive has its supply of sand.
7th – Raise or lower the buffers of the locomotive.
8th – Obey the orders received from the driver regarding the performance of the service.
9th – As a general rule, give reasonable advance notice (at least 4 hours) when, due to illness or serious causes, you cannot undertake (your) duty, in order to be able to make the necessary arrangements to avoid disruptions at work. These absences must be duly justified in due course.
10th – Cooperate with the other personnel to turn the locomotive in places where due to lack of traffic it is not possible to constantly maintain sufficient personnel.
11th – Cooperate in general outside the shed to supply water to the locomotive.

TRACTION OFFICE
MIMEOGRAPHIC INZAURRALDE Telephone 29 58 10 Legal Department 29.700/75.-

M A N U A L January 1976.-
"Steam locomotives for engineers and firemen" Alterations by way of "errata"
Pág.1- Descriptive - It should say: The locomotive. The steam locomotive consists of a frame on which the boiler is mounted and the entire locomotion mechanism secured; cylinders, movement, shock and traction devices, etc. See sheets N2 01 and 001
The boiler or steam generator consists of a barrel or cylindrical body, a firebox and a smokebox. The barrel contains a series of tubes secured between the tube sheets of the fireboxes and smokeboxes; through them the combustion gases pass from the first to the second, and from there through the chimney to the outside air
The firebox is the (rectangular) part (rear end of the boiler) where the fuel is burned. It consists of an outer sheet metal casing, attached to the grate (its inner part where the fire is produced) with bolts or boiler bolts, and roof screws, the casing and the grate consist of the following sheets: front, rear, left side, right side,

tending to the upper part of the wrapper, the roof, and of the grate, the sky. The enclosure and the hearth are joined at the bottom by the foundation ring, to which the ashpan is attached. In the "fuel oil" locomotive, the ashpan is the actual floor of the firebox, where the refractory brickwork is located, protecting the sheets and maintaining the ignition temperature of the "fuel oil" or petroleum. Both the firebox and the tubes are surrounded by water on their entire outer surface, during normal operation, from the inner surfaces of the firebox and the tubes the heat the gases is transmitted to the water which, evaporating, transforms it into steam that fills the top of barrel and firebox. The smoke box is the front part of the boiler, where by appropriate means a vacuum is created that produces the evacuation of the gases towards the atmospheric exterior.

Page 3 - Line 9 and following - It must say:

... smoke at the outlet of the superheated steam or in the same superheater. Its actuation is generally carried out through a bar that in the first case is inside and in others it is outside the boiler, and that ends in the regulator lever where the driver acts.

Line 16 - It should say:

Safety valves - With valves generally loaded by means...

Line 28 and following - It must say:

The envelope heater -. It consists of a collector that receives common or saturated steam from the boiler through the horizontal pipe; directs it towards the elements on heaters so that its temperature at the pressure of the boiler is high, eliminating the humidity and water particles that it had dragged, receiving it again already superheated to send it to the distribution valves in the cylinders.

Water level indicator - "There are two of these placed at the rear of the boiler that show the level of the water in it at all times and indicate to the personnel when they must introduce water.

Page 4 Line 6 - It must say:

the frame is the strong structure of the locomotive. ...

Page 6 - Line 11 - It must say:

Lubrication - The lubrication of the valves and cylinders is carried out by means of hydrostatic lubricators or by positive injection lubricators mechanically operated from the locomotive itself.

Page 7 - Line 17. It must say: - brakes, automatic vacuum and or steam.

In the A.F.E. steam locomotives are equipped with handbrakes, automatic vacuum brake for the machine and the train, and for shunting they have a valve (macaco) that allows to act in the vacuum of the machine and tender.

Class V locomotives have a steam brake on the engine.

Page 9 - Class D locomotives no longer exist in A.F.E., so they should not be considered.

Page 10 - Line 7 - It must say:

Being from the square...

Lines 10 and 11 It should read: ... double the crankpin radius and lastly P the average pressure in pounds per square inch inside the cylinders.

Line 20 - It should say ... then the mean effective pressure

Line 30 It should read: ... in the middle of the glass tube...

Page 13 - Line 12 It should say: ... state of the grills is ...

Line 14 - I must say: ...and the perforated traps well erased.

Line 20 - It should read: ... air through the grilles with disastrous results.

Page 32 - I can say: there are injectors for the impulsion and the exhaust.

Page 14 - Lines 3 and 4 - ... works with a closed regulator. See sheet N°3. They no longer exist in A.F.E. From line 5 to line 37 it is cancelled.

Page 15 - From line 1-to line 4 is cancelled.

'Lines 6 and 7 - Should read: The two best known types are the Ramsbottom type and the more modern "Ross" type.'

Line 18 - It must say: The types of valves mentioned are…
Line 32 and 33 - …they enter the home putting out the fire and in this way...
Page 16 - Lines 15 to 17 - It should say: ... trip. the fusible plug is illustrated on the sheet 5° Regulating valve - Already described on page 3
Page 17 - Line 9 - The steam heater envelope -
Throughout the chapter it should say: superheater for superheater.
Page 18 - Line 12 It must say:
Water level indicators - A...
The machines are provided with two glass tubes for ...
Line 18 - It should read: As there are two separate indicators...
Line 26 - It should read: ... from the explosion of the glass tube.
Line 31 - It should say: The level glass tube...
Line 34 - It should read: ... the vapor in the glass tube is colorless
Page 22 i From line 26 to line 30 it is canceled
Page 23 1 Line 5 - It should say: ... attached to the drive shaft of the machine.
Page 23 - Line 11 - You should say: ... by the gear lever...
Line 23 and 24 — It should read: Crank C with the wheel in the driving point up, the valve...
Page 24 - Line 11 - You should say: ... pulley and collar types would have been...
Page 27 - Lines 33 and 34 - It must say:
Automatic vacuum brake - description and operation. (See the "Regulations for the use of the F.A.V. approved on 4/4 79)
Page 32 - Line 24 - It should say: ... of steam through the small cone 18 and of ...
Page 35 -Line 13 - Drink say: ...in his container. (See the "Regulations for use of the F.A.V, approved on 4/4/74)
Line 16 - It must say: ... machines, tenders and some vehicles, and those of the type...
Line 18 - It must read: … wagons and cars in a more general way.
Line 20 - It should read: ... separate void, fig.1 that
Line 26 - It should say: ... press (5) and rubber packing ring (11).
Line 28 - It should read: ... rubber seat valve •• (13) 1 diagram prevents the entry of atmospheric air and gives enough flexibility to lift the valve and balance the chambers in the cylinder.
Line 35 - It should say ... little holes (A).
Page 36 - Line 3 and 4 — It should read: ... Pipe B. and the air from the upper part of the plunger is also extracted through the ball valve (¿) and the little holes A
Page 37 - Lines 14 and 15 It should read: ... plunger (T) and the other to join the vacuum container or the lower chamber of the plunger (V).
Line 18 - It should read: ... Vacuum chamber (3°) around...
Line. 23 - It should say: ... ball instead of seat with rubber washer. Lately these type C cylinders are being perfected by placing a seat valve and the three small holes A, eliminating the ball valve. (Attention: it is not possible to place a poppet valve in a type C cylinder, without the holes A)
From line 25 to line 28, it is cancelled.
Line 29 - It should say Auto Brake Vacuum Gauge. The vacuum indicator vacuometer...
Page 39 - lines 3 to 6 - It should say: 1 brake vacuum gauge in the van is attached by means of a pipe to the upper part of the vacuum container of the valve and marks the established degree of vacuum.
Line 10 - It should say: These valves have vacuum gauges to ...
Page 39 Line 15 It must say: ... I prescribe the law" -See Art 19 of the "Regulations for the use of the P.A.V. " approved 4/4/74
Page 40 Line 16 It should say: good meeting.
See Art 2fl of the "Regulations for the use of the F.A.V. and approved on 4/4/74

Page 42 - Line 28 - It should say: ... boiler, all wood residues and foreign bodies...
Page 45- Line 2 - It must say: ... deposit by direct steam...
Page 46 - Line 8 It should say¥ ^1 good handling of traps is extremely...
Page 51 - Line 5 It should read: Make sure the burner is completely clean.
Page 53 - Line 1 *• It should say:
Manual 1st of the automatic brake Empty the "Regulations for the use of the F.A.V. approved on 4 4/74.
Page 54 - Lines 3 and 4 - It should read: ... in Article 14a of the cited Regulation»
Page 55 - Line 26 - It should read: ... on the vacuum gauge of the machine, o3. ...
Page 57 - Lines 22 to 24 - It should read: ... one of the handheld vacuum gauges, which, except for a very slight difference, should show the same degree of vacuum as the ¿Equine vacuum gauge?
Line 27 - It should say: ... the hand vacuum gauge...
Line 29 - It must say: ... consideration between this and the one of the machine, os ...
Lines 31 to 38 - It should say ...When this happens, the hand vacuum gauge can be placed in the other sleeve of the opposite head of the the machine as a supplementary test and if there are two handheld vacuometers in the revision or consignment of machines where the vacuum gauges are kept, one can be placed on the brake hose of the machine and the other on the hose of the tender, controlling the difference in vacuum that accuse the three vacuum gauge.
Page 58 - Line 1 to 3 It should say: ... on the side vacuum gauges, invert their placement, if there is an obstruction in the brake pipe, the vacuum gauge should be placed.
Page 59 - Line 10 It should say: ... needles on the vacuum gauge of the machine...
Page 60 - Lines 22 and 23 - It should say: ...exposed
in Art. 159 of the "Regulations for the use of the F.A.V." approved 4/4/74*
From line 24 to line 34 is cancelled*
Page 61 - From line 1 to line 34 is cancelled.
Page 65 - Lines 13 and 14 - It should read: "'See this
regarding the Art. 52 of the "Regulations for the use of the F.A.V." approved 4 4/74.
From line 15 to line 27 is canceled
Page 66 - Line 14 It should read: ... resetting on the vacuum gauge when stopping...
Page 67 - Line 35 It should read: ... from the train, the vacuum gauge reads at least 10 inches...
Page 69 - Line 16 It should read: -... increasing the degree of restraint. ••
Page 70 - The last paragraph should say: when changing machines on a train, it will not be possible to be sure about the degree of vacuum in the brake marked by the other locomotive, it will correspond to the guard, in this case, comply with what exposed in the Art. lis of the "Regulations for the use of the F.A.V/" approved on 4/4/74.
Page 71 - Last paragraph should say: When proceeding to uncouple the brake hoses For this procedure, follow the provisions of Art. 32 of the "Regulations for the use of the F.A.V. approved on 4 4/74
Page 7/2 From line 1 to line 4 is cancelled.
Line 7 Must* say: ... Operations personnel when uncoupling ...
Line 14 - It must say: to the mentioned article for which reason*...
Page 72 Line 19 - It should say: …the Exploitation personnel have been warned •••
Fág.73 Line 4 It must say: ... before the void. See ~ Art. 69 of the Regulations for the use of the F.A.V. approved on 4 4/74-Line 5 to 17 They must say:
In the same way, it must be reported when, during the maneuvering period, it is observed that Art. 102 of the aforementioned Regulation is not complied with.
Lines 22 and 23 It must say: …requires Art. 122 of the aforementioned regulation.
Page 74 — Line 10 It should read: ... serious accident»
See Art. 102 of the "'Regulations for the use of the F.A.V." approved 4/4/74
From line 11 to line 17 is cancelled.

Line 32 - It must say: …See Art. 82 of the Regulations for the use of the F.A.V. "approved '4/4/74
From line 33 to line 36 it is canceled»
Page 75* - Line 56 - It should say: … required by Art. 9fi of the "Regulations for the use of the F.A.V." approved on 4'4/74.
From line 7 to line 18 is canceled
Lines 22 and 23 - It must say: ... the train drivers meet the requirements of Art., 172 of the Regulation for the use of the F.A.V. approved on 4' 4/74
From line 24 to line 36 is canceled
Page 76 - From line 1 to line 7 is cancelled.
Lines 27 and 28 - It must say: ... competent of the Material and Traction Management before going to provide service in-Exploitation»
Page 80 - Line 16 - It should say... Steam from the dome to the cylinder...
Page 81 Line 4 It must say: ... You must test the mass or hub of the wheels...
Lines 24 and 25 It should say: ... with the filling of sandbox deposits.
b) Connecting rods, bolts, etc. - In A.F.E. exists...
It is recommended that each tenderer of the "Manual of steam locomotives for train drivers and firefighters" proceed to make the corrections with fine print, pairs and chlorine, following what is indicated in the preceding text. When for reasons of space you cannot proceed as indicated, you must write down - See errata of January 1976 - so that when reading it you can follow the explanations as directly as possible.

9.8.4 Papers from the 5th *Congreso Panamericano de Ferrocarriles* 1946

Two papers from volume three of the transactions of this conference, held in Montevideo in April 1946. These papers were prepared and read by P. C. Dewhurst and Thomson Fairless of the CUR.

TEMA 6

COMBUSTIBLES. DISPOSITIVOS PARA SU MEJOR UTILIZACION. MODIFICACIONES A LAS LOCOMOTORAS QUE QUEMAN FUEL OIL PARA QUEMAR LEÑA O CARBON.

AUTOR: *Ingeniero P. C. DEWHURST.*
RELATOR: *Ingeniero JULIO ADER.*

62.

El Ferrocarril Central del Uruguay ha sido obligado a usar leña y carbón solamente en lugar de fuel oil como ha sido la práctica hasta el presente; por lo tanto su contribución a este «symposium» queda naturalmente limitada a lo que se ha hecho en este respecto. La descripción de las modificaciones queda cubierta en gran parte por los dibujos, y para los entendidos en materia de locomotoras con muy pocas explicaciones textuales queda explicado.

Las fuentes principales de suministro de leña —quebracho y otras leñas duras— están en el Paraguay y por lo tanto debe importarse la leña. Suministros locales de leña de «Monte» se utilizan principalmente para encender y para máquinas de maniobras, como así también en casos de emergencia en las vías principales. Estas, sin embargo, no llenan nuestras necesidades por las mismas razones expuestas sobre la leña de Eucaliptus.

El Eucaliptus es completamente inadecuado para uso en las lineas principales del F.C.C.U. principalmente debido al uso intenso de secciones de una sola vía y la necesidad imperiosa de mantener los horarios fijados, que son sobre las bases de velocidades relativamente altas haciéndose notar que todo el tren rodante del C.U.R. se encuentra equipado con frenos al vacio lo que permite obtener altas velocidades en todos los trenes.

Algunas de las máquinas de tamaño mediano del F.C.C.U. (Clase «Ns») han sido convertidas de fuel oil a carbón y como consideramos este un asunto de interés, hemos incluído dibujos y diagramas de los arreglos que consideramos necesarios.

El carbón que se ha podido obtener ha venido de varios lugares y en cantidades relativamente chicas: Cardiff y Durham en Inglaterra, Sud Africa, Chile y Norte América, Pocahontas y Kanawha o Thacker Splints, la mayoría de estos carbones es casi todo cisco y sin zarandear, por lo tanto es menudo. Algunos eran de calidad muy pobre, especialmente el Chileno y el Sud Africano.

Aqui talvez sería oportuno citar la experiencia obtenida en el Uruguay, con respecto a la relación de consumos: Fuel Oil = 1, Fuel Oil a carbón = 1 a 1.5; fuel oil a leña dura = 1 a 4, al peso.

Como nuestro stock de locomotoras trabajando con fuel oil apenas alcanza a las necesidades del trabajo, a pesar de mantener un «potencial término medio» elevado, hemos tenido especialmente en la mente el trabajo a efectuarse en base a toneladas arrastradas por hora de locomotora.

Aunque se apreciará que no es posible hacer un cálculo exacto, juzgando por lo que se ha hecho aquí, las ventajas y desventajas resultan como sigue:

De fuel oil a carbón, sin pérdida de velocidad, un 15% menos de carga. De fuel oil a leña un 25% menos de carga y 15% menos de velocidad. De carbón a leña un 12½% menos de carga y el 10% menos de velocidad.

Las pendientes en las lineas del F.C.C.U. son pronunciadas 1 en 100, 1 en 80 y hasta 1 en 60 y esto influye en los resultados.

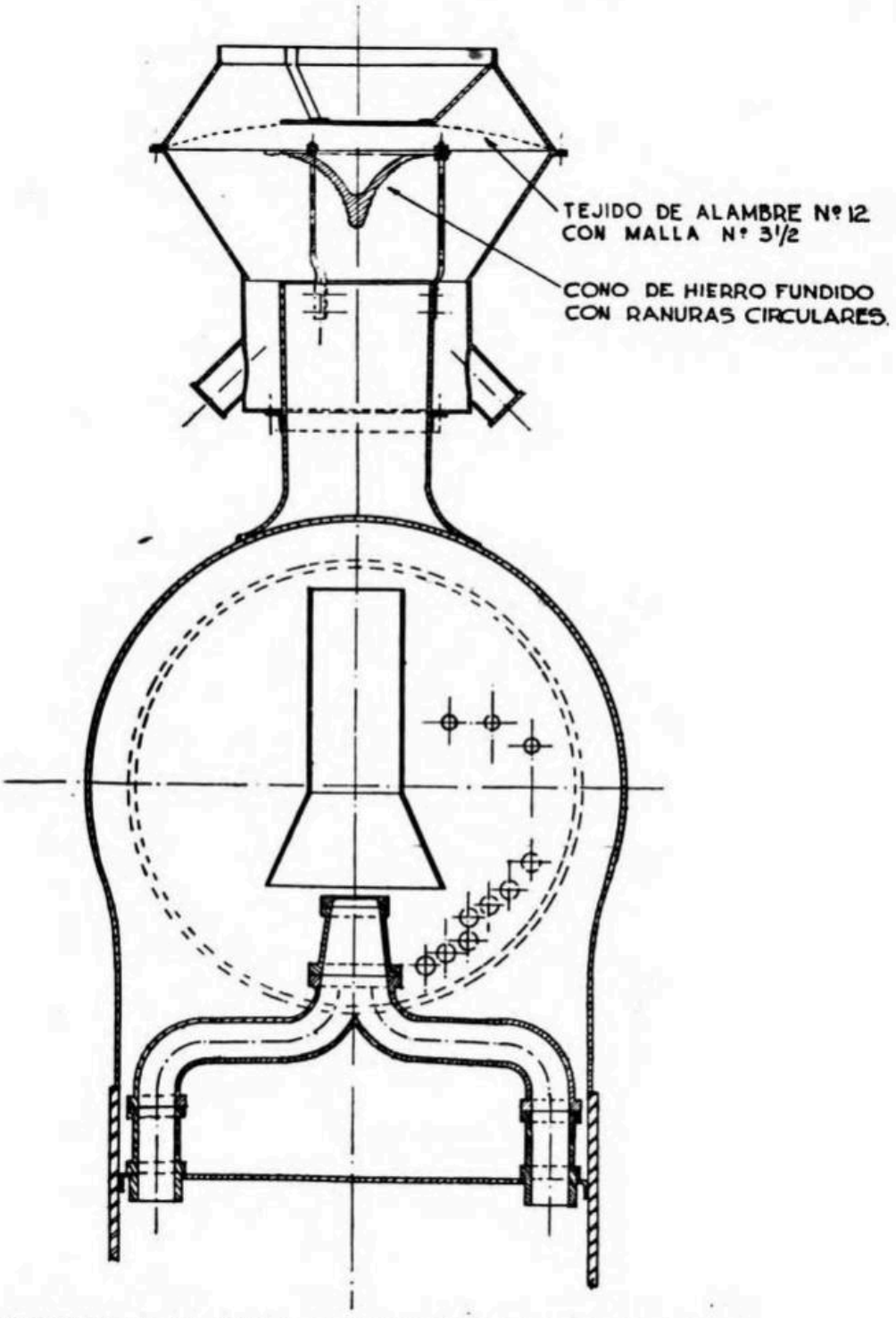
MODIFICACIONES ESTRUCTURALES EN LOS CENICEROS, PARRILLA Y ARREGLOS DE CAJA DE HUMO, ETC.

La gran mayoria de las locomotoras que fueron convertidas para quemar leña combustible en lugar de fuel oil fueron de tamaño mediano, las modificaciones consistiendo, naturalmente, en el cambio del hogar por ceniceros muy similares a los usados en las locomotoras que queman carbón con la excepción de que se prestó especial consideración a los ceniceros para evitar que las brasas cayeran entre los rieles y causaran incendios, las parrillas fueron colocadas con su espaciamiento de aire reducido adecuado para quemar leña, y un chispero relativamente sencillo fué aplicado sobre las chimeneas, alargandose esta algo, aunque en algunos casos se usó un chispero cónico en combinación con una red de alambre colocada sobre la chimenea. Estos varios sistemas estan descriptos más adelante, comenzándose sin embargo con las locomotoras mes pequeñas.

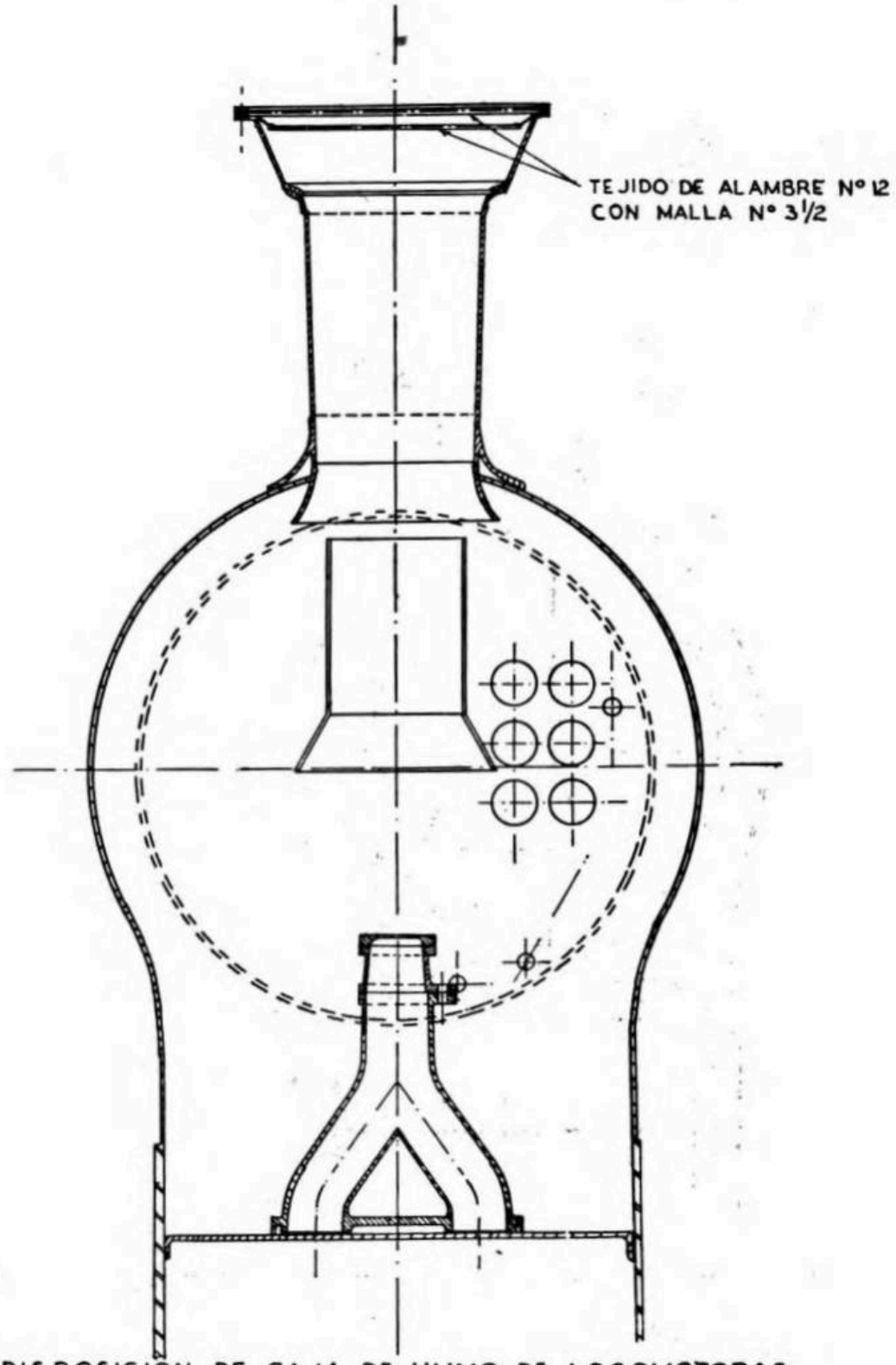
Hay algunas locomotoras chicas en este ferrocarril (clase «G» con tenders) que se emplean en recorridos cortos y para servicios de maniobras, las cuales han sido equipadas con chisperos muy eficaces. Véase figura (1) El cenicero es similar a la figura 3, y la parrilla a la figura 4.

Estas máquinas se encuentran con chimeneas tipo «Diamond» con el caño de la campana angosto y bajo, mejorando la evaporación con un consumo algo reducido de leña, al mismo tiempo el caño de escape ha sido bajado 21 pulgadas, quedando la boquilla del caño de escape sin cambio.

Todas las demás locomotoras que fueron convertidas para quemar leña combustible y que son utilizadas en trayectos largos en las lineas



DISPOSICION DE CAJA DE HUMO DE LOCOMOTORAS
PARA QUEMAR LEÑA
MAQ CLASE G
FIG 1



DISPOSICIÓN DE CAJA DE HUMO DE LOCOMOTORAS
PARA QUEMAR LEÑA
MAQ. CLASE R C.T.
FIG. 2.

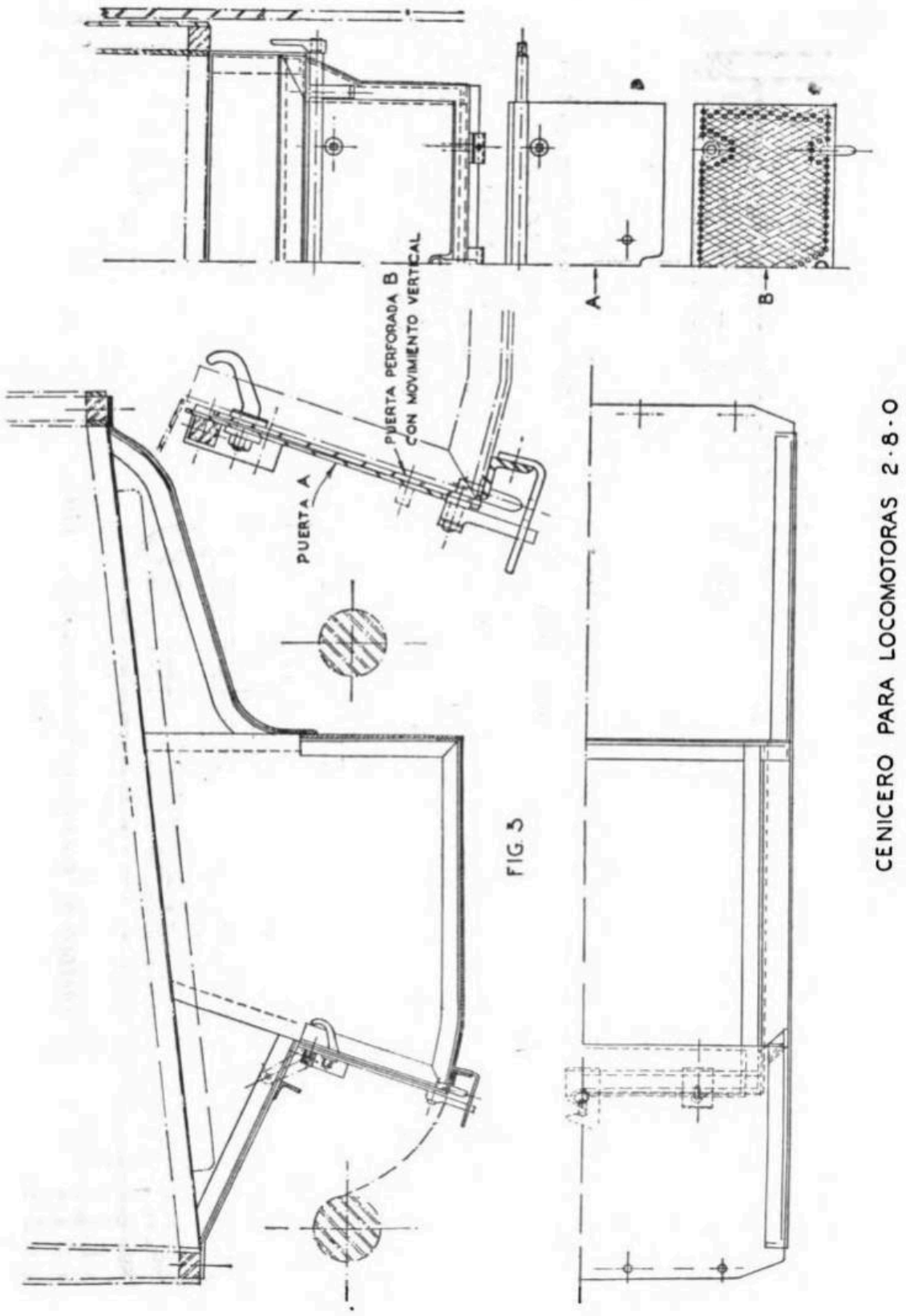
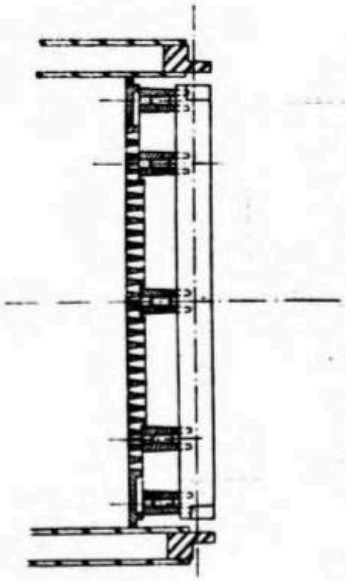


FIG. 3

CENICERO PARA LOCOMOTORAS 2·8·0



LOCOMOTORAS TIPO 2-8-0
CILINDROS 19" X 24"

AREA DEL EMPARRILLADO 25 PIES²
" DE AIRE LIBRE DE IDEM 5.9 "
" DE GAS A TRAVES DE LOS TUBOS 3.6 "
LAS PARRILLAS PARA LEÑA ESTAN COLOCADAS SOBRE LOS SOPORTES DE PARRILLAS PARA CARBON

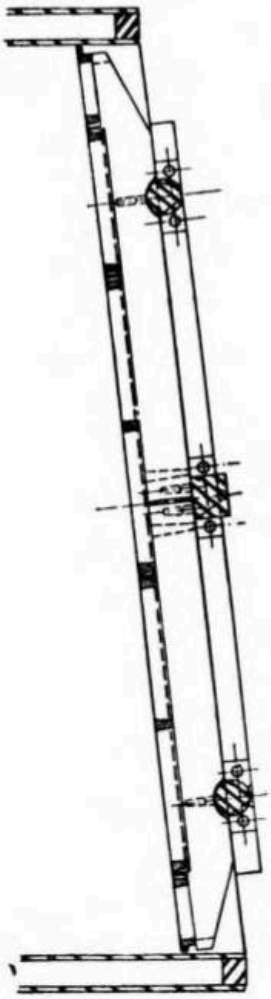
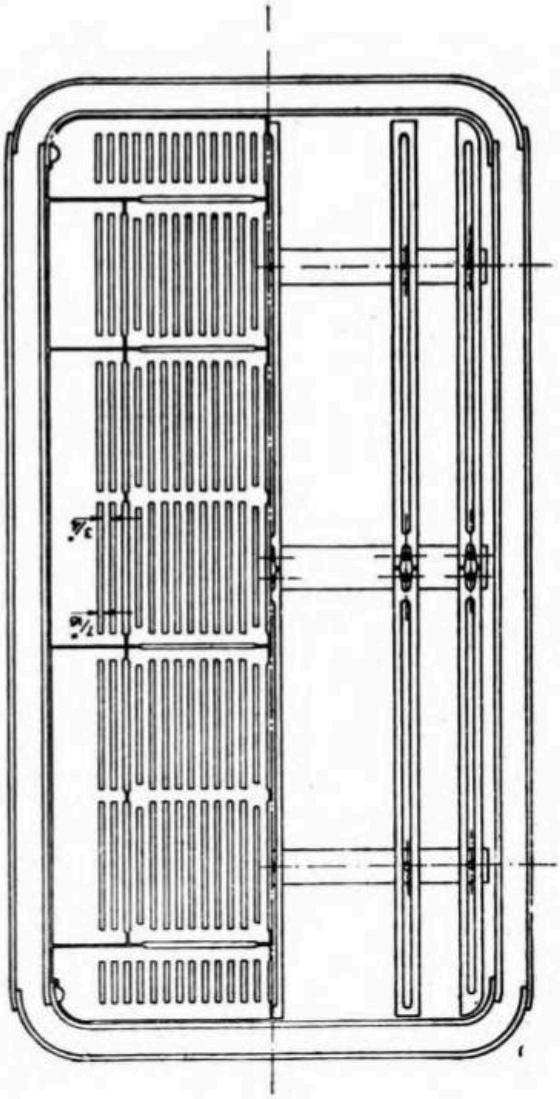


FIG. 4



ARREGLO DE EMPARRILLADO PARA QUEMAR LEÑA

principales, fueron equipadas con un sistema —posteriormente modificado en form aparcial como se podrá apreciar— algo parecido a aquel que fué utilizado aquí en el año 1917-18; este es algo menos efectivo como chispero pero se obtiene un mayor redimiento de la locomotora del que es posible con el llamado arreglo del chispero al 90% de la figura 1; naturalmente no existe sistema alguno que pueda tener el 100% de efectividad sin reducir enormemente el rendimiento de la locomotora.

Para una descripción general de las locomotoras a leña tenemos una de las grandes que fueron convertidas. Con estas locomotoras («R-1» y «R-2») se introdujeron menos cambios que en las otros, y los arreglos y detalles de la caja de humo y chispero, ceniceros y parrillas pueden verse en Figs. (2, 3 y 4) y pueden considerarse como típico en las lineas del F.C.C.U. En todos los casos naturalmente los detalles especiales de la puerta del hogar para quemar fuel oil fueron modificados por otro tipo adecuado para quemar leña o carbón. Se dan además algunos datos generales como ser, areas del emparrillado, areas de gas, superficies de calentamiento, etc. con respecto al funcionamiento de locomotoras a leña:

Cilindros 2	483 × 610 mm.
Diam. ruedas motoras y acopladas	1372 m/m.
Superficie de calentamiento, caja de fuego	11.8 mts.^{2}
Superficie de calentamiento, tubos grandes	32.7 »
Superficie de calentamiento, tubos chicos	78.13 »
TOTAL	122.63 »
Superficie de recalentador	25.3 »
Area del emparrillado	2.32 »
Area de aire libre del emparrillado	0.55 »
Area de gas a través de los tubos	0.33 »
Volumen de caja de humo	3.8 mts.^{3}
Presión de la caldera	11.25 kgs./cm.^{2}
Fuerza tractiva a 85 % de la presión de la caldera ..	9897 Kgs.
Tapa caño escape	117.5 mm.

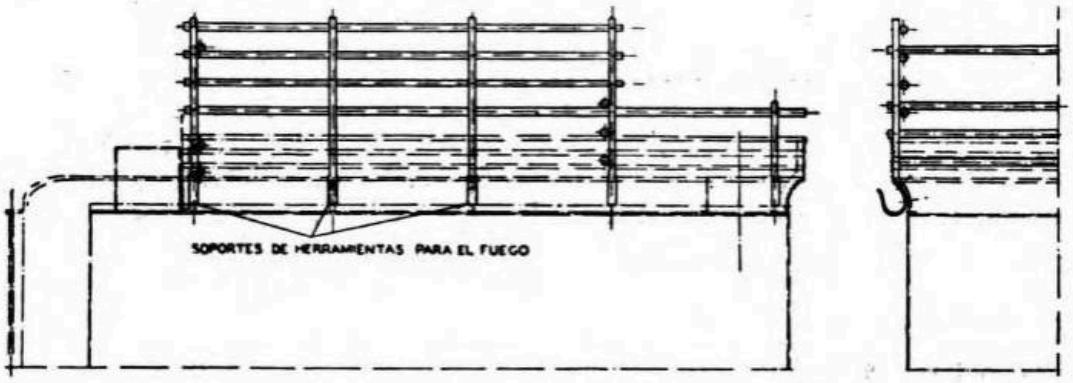
El cenicero para fuel oil fué sustituido por otro muy parecido a aquellos usados en estas locomotoras que usaban carbón; se notará que incluye un arreglo especial de la puerta del cenicero por el cual mediante una chapa perforada cierra automaticamente esta cuando está en servicio.

Esto se lleva a cabo arreglando la puerta ordinaria y la chapa perforada suplementaria, de manera que aunque después que se haya enganchado la puerta y chapa para limpiar el cenicero, cuando se utiliza la trampa (registro de aire), la chapa perforada se cierra automaticamente en posición para el servicio.

Las parrillas estan naturalmente provistas de pasajes de aires angostos y el area total del pasaje de aire es considerablemente menor que

el que se necesita para quemar carbón. Después de varias pruebas se encontró que un ancho para la entrada de aire de 11.1 m/m. con una parrilla de 19 m/m. cuidando, naturalmente, que los espacios no estén demasiado cerca de los costados de la caja de fuego dieron resultados satisfactorios.

El arreglo de la caja de humo de estas locomotoras antes de su conversión para quemar leña constaba de un caño de escape relativamente bajo y equipado con un «saltador» para evitar una excesiva contra-presión en los cilindros; una chimenea sencilla algo cónica y una campana (petti-coat pipe) descontinuada. El cambio consiste en la sustitución de un caño de escape con boquilla sencilla en lugar del tipo saltador y aplicándolo a la salida de la chimenea — después de haber torneado el anillo de reten de la chimenea — un dispositivo acampanado dentro del cual se encuentran dos redes de tejido de alambre separados por un espacio de 50.8 m/m; ambos pedazos de tejido pueden retirarse con facilidad con destornillar cuatro tuercas mariposa, retirándose



BARANDA DE TENDER PARA LEÑA FIG 8

estas al encender las locomotoras. La red inferior tiene un juego de 6.35 m/m. que permite un movimiento vertical lo que a la vez mantiene dicha red libre de escoria debido a las vibraciones que se producen cuando la locomotora trabaja despacio.

En el caso de uno de los tipos de locomotoras mas chicas (clase «L») se encontró que daba resultados mas satisfactorios el empleo de una combinación de chisperos, uno en la parte superior de la chimenea con una sola red de alambre y el otro adentro de la caja de humo, parecido a la usada en las locomotoras que queman carbón. Véase Figs. 2 y 7.

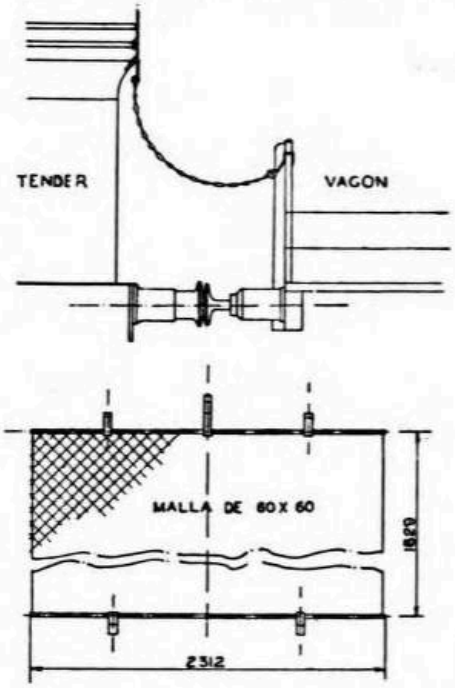
Dado su resultado favorable se extendió el uso de este sistema a las locomotoras de tamaño mediano, es decir, a las de clase «Ns».

La capacidad de los tenders fué aumentada de 12.7 a 14.2 mts.^{3}, obteniéndose el espacio adicional agregándose a la baranda tubos de caldera viejos, soldándose toda la estructura.

Como podrá observarse por la figura Nº 5 el espacio indicado no llega hasta el extremo del tender —con excepción de aquellas loco-

motoras del tender de recorridos cortos y locomotoras de maniobras donde llega el final del tender — con el objeto de dejar un espacio donde recibir la leña pasada por el pasaleña que ocupa el wagon inmediato. La leña es tirada sobre la parte posterior del tender por dicho pasaleña, y como esto se hace a menudo mientras se está de viaje, se colocó una red especial flexible desde la parte posterior del tender fijándose el otro extremo en el wagon, para de esta manera evitar la caída de leñ asobre la vía con riesgo de descarrilar el tren.

Tales fueron las dificultades con respecto a la falta de espacio, que las cajas de herramientas tuvieron que colocarse adelante sobre el cos-



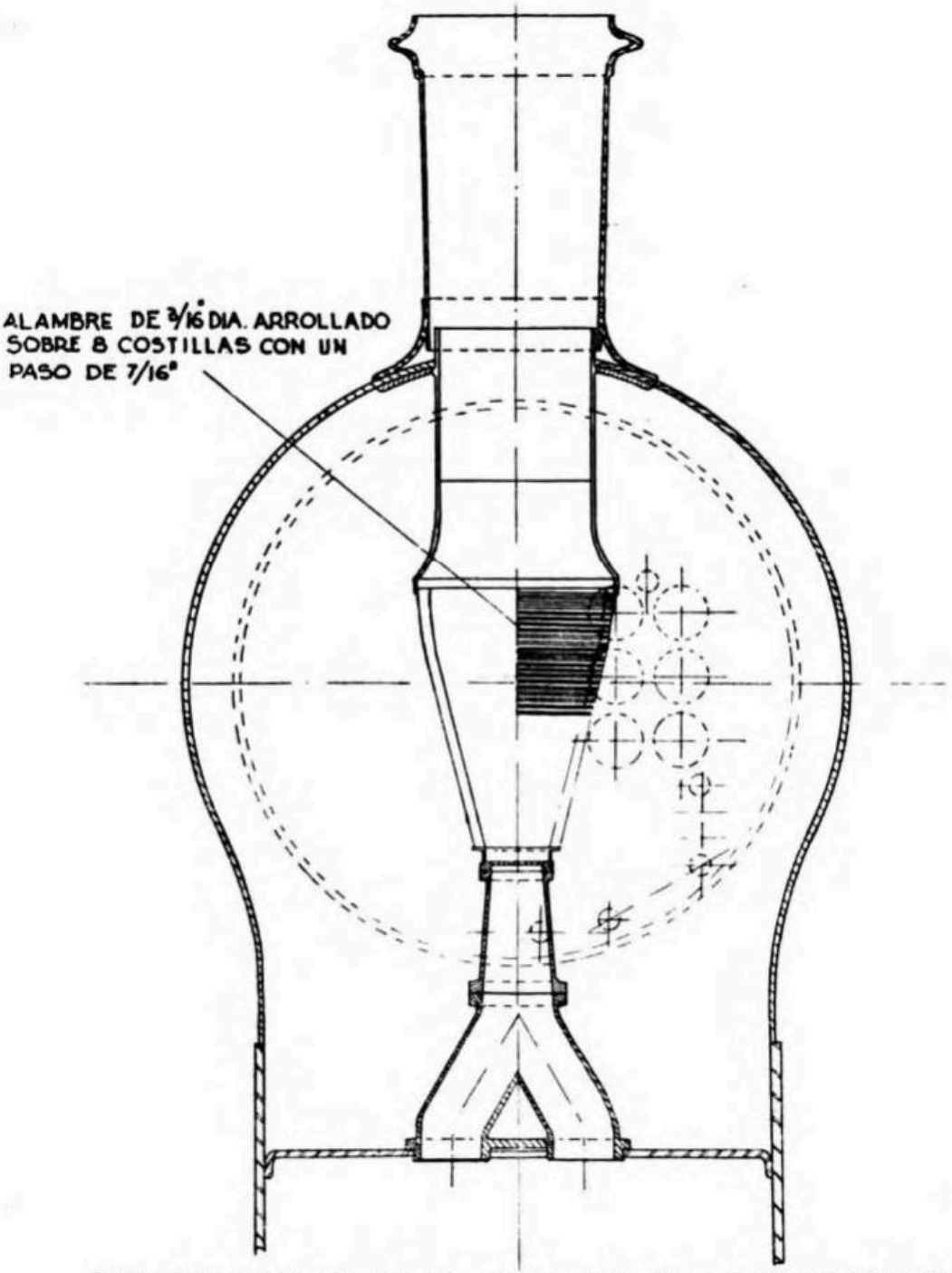
RED DE SEGURIDAD ENTRE TENDER Y VAGON EN USO
FIG. 6

tado de la máquina, y hasta los hierros para el fuego en un costado del tender.

En las Figs. 5 y 6 puede verse las barandas del tender y la red del tender respectivamente.

La capacidad de carga de leña de las locomotoras que quemaban este combustible aumentó con motivo de la instalación de las barandas mencionadas entre 12.7 mts.^{3} en el caso de las locomotoras chicas a 14.2 mts.^{3} en el caso de las mas grandes, como así también en aquellas que se empleaban para maniobras y recorridos cortos, y que no estaban provistas del espacio necesario para recibir leña en la parte trasera del tender.

Las locomotoras que trabajan sobre las vias principales, van siempre acompañadas del wagon de leña, en algunos casos uno y en otros casos dos, siendo la capacidad total de leña llevada en el último caso



DISPOSICION DE CAJA DE HUMO DE LOCOMOTORAS
PARA QUEMAR CARBON
MAQ. CLASE N2 CT
- FIG. 7 -

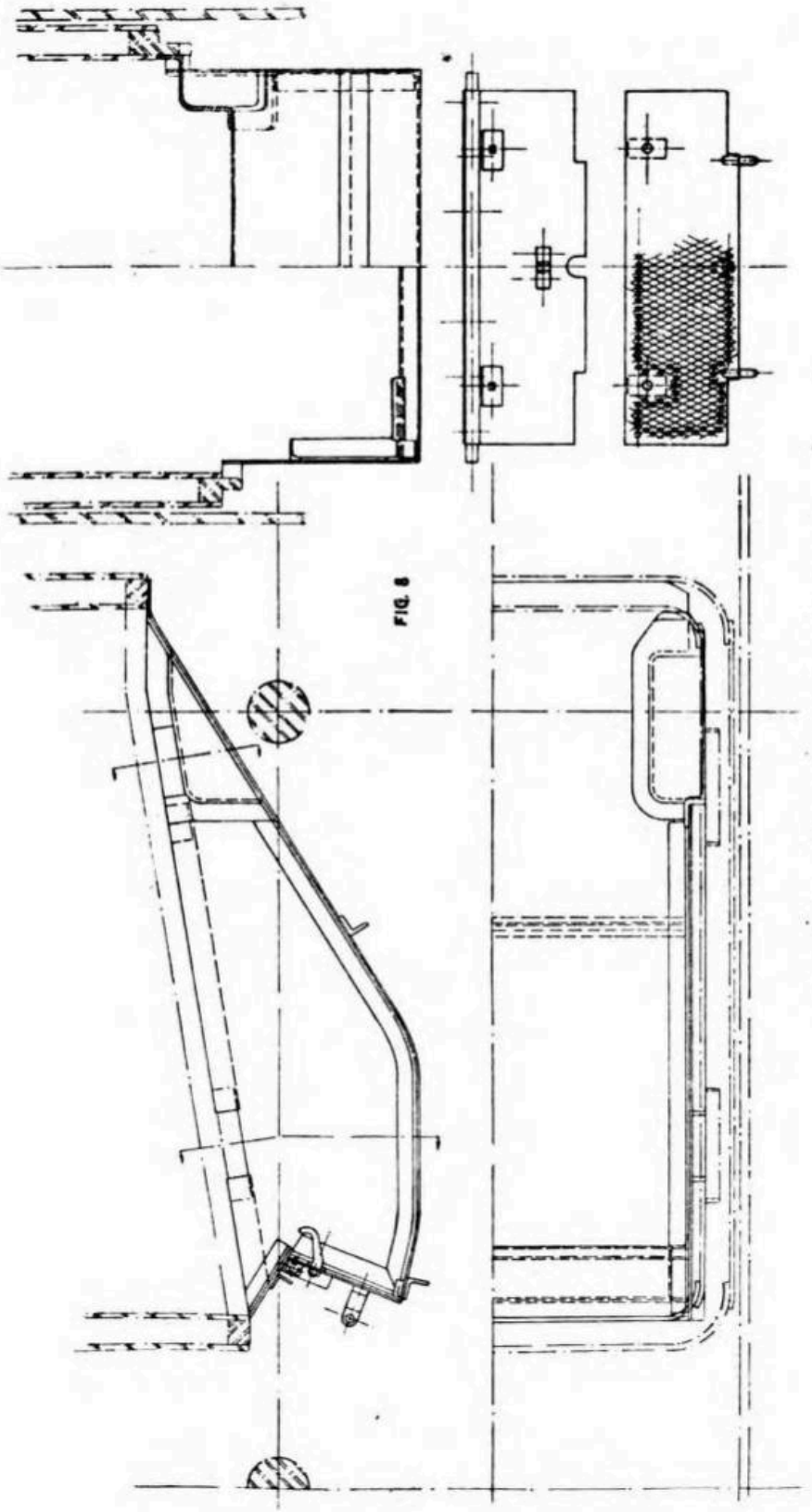


FIG. 8
CENICERO PARA LOCOMOTORAS 2-6-0

mencionado de alrededor de 21 toneladas de leña en total, con lo cual una carga completa es arrastrada sobre un recorrido de hasta 274 kilómetros.

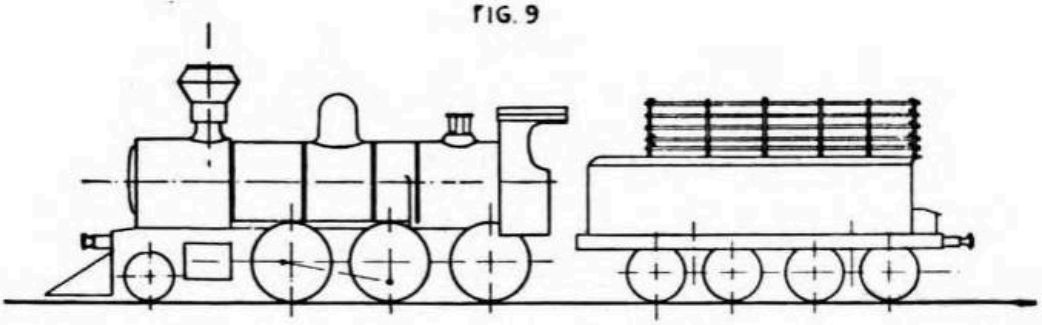
Las conversiones a carbón (la mayoría locomotoras de clase «N2» y «N3») han sido arregladas por la sustitución de ceniceros especiales para quemar carbón, pero con la puerta del cenicero con plato de protección a que se refiere anteriormente — véase Fig. 8 — aunque como es natural las parrillas son adecuadas para quemar carbón.

Los cambios de caja de humo, etc. —véase Fig. 7—, han sido los siguientes: la altura del caño de escape, que tenía medio bajo, quedó como para locomotoras que queman fuel oil, pero la tapa del caño de escape fué cambiado del tipo saltador de 114.3 m/m. de diámetro con «nibs» a 114.3 m/m. tipo plano sin «nibs», el área equivalente respectiva habiendo cambiado de 95.5 a 102.5 cm.^{2}. La chimenea en sí también quedó como estaba antes, pero la campana descontinua, muy similar a la de la Fig. 2 ha sido reemplazada por una prolongación continua interna de la chimenea, a la cual se le colocó en su extremo inferior un chispero cónico compuesto de una jaula de alambre horizontal (Fig. 7) extendido entre la orilla de la boca de la campana y la tapa del caño de escape.

En algunas locomotoras — de tamaño mediano — el único cambio que se hizo en la extremidad de la caja de humo para quemar carbón fué la aplicación del tejido horizontal en la parte superior de la chimenea, como se ve en la figura 2, pero solamente con una sola capa de tejido en lugar de dos. Arcadas o bóvedas de ladrillos fueron colocadas naturalmente, en estas locomotoras a carbón.

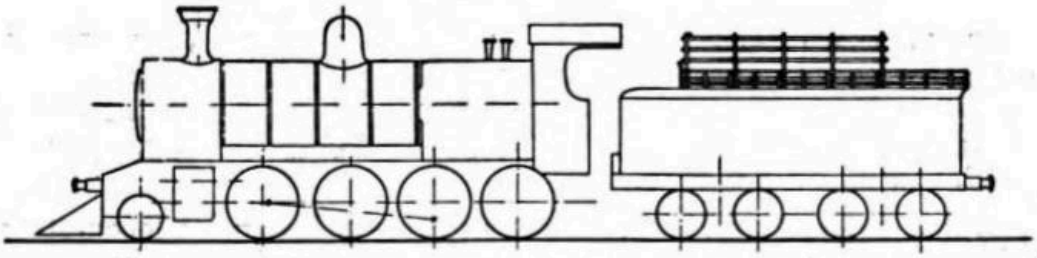
Pequeños diagramas de las varias clases de locomotoras del F.C. C.U. y mencionadas en este breve comentario pueden verse en Figs. 9 al 13.

FIG. 9



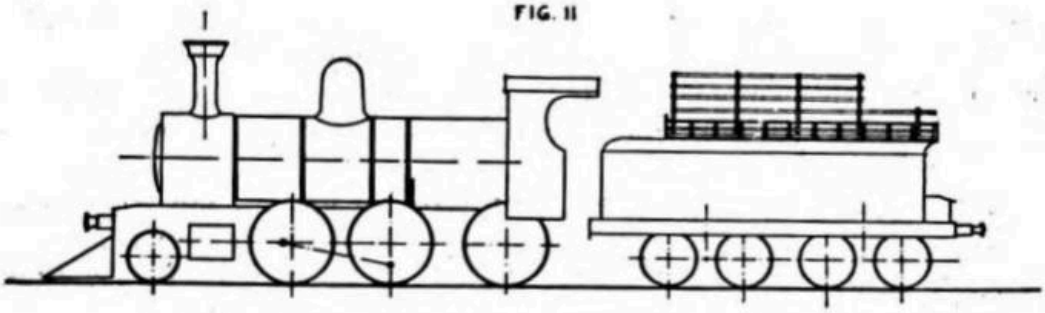
LOCOMOTORA CLASE G. A LEÑA

FIG. 10



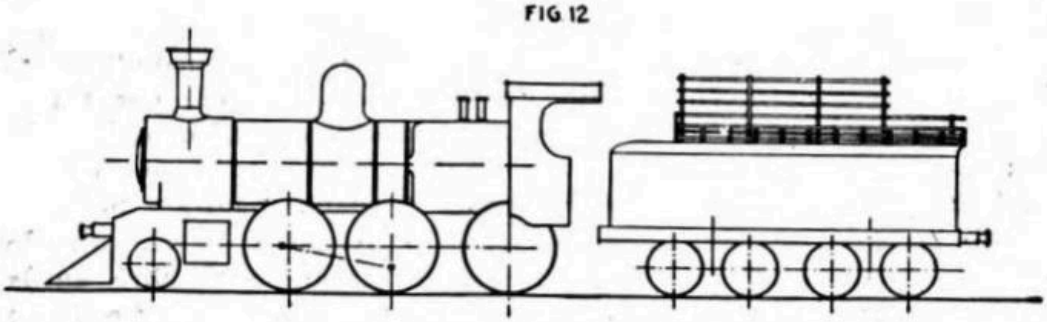
LOCOMOTORA CLASE R A LEÑA

FIG. 11



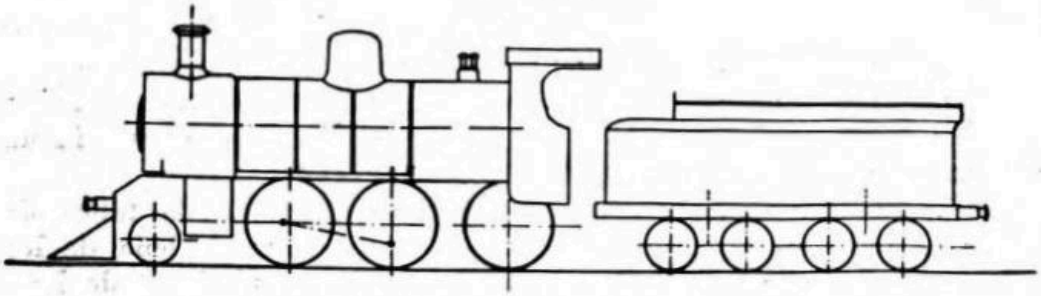
LOCOMOTORA CLASE L A LEÑA C.T.

FIG 12



LOCOMOTORA CLASE N^{5} A LEÑA C.T.

FIG. 13



LOCOMOTORA CLASE N^{2} A CARBON C.T.

INFORME DEL RELATOR

Se hace en primer término una breve reseña de los resultados obtenidos en el Ferrocarril Central del Uruguay al quemar fuel-oil, carbón y leña citándose cifras comparadas de consumos en peso y porcentajes también comparados del tonelaje de arrastre y velocidad logrados con esos combustibles.

En lo referente a las modificaciones efectuadas en las locomotoras a fuel-oil para quemar leña o carbón, comprenden lógicamente al cenicero, parrilla adecuada para el tipo de combustible a quemarse y caja de humo.

Los ceniceros en general tienen una disposición similar, con la excepción claro está, de la forma a que obliga la disposición de los ejes y del mayor volumen requerido cuando se quema leña. Están dotados de un dispositivo automático en la puerta, de manera que cuando se opera el registro de aire una chapa perforada ocupa su posición cerrada (posición de servicio).

En lo que atañe a parrillas se utilizan los mismos soportes así se queme carbón o leña. Lo único que varía es desde luego la parrilla misma que en el caso de utilizarse leña tiene un área de pasaje libre para el aire considerablemente menor que cuando se quema carbón.

En lo que se refiere a modificaciones en la caja de humo los dispositivos varían según se trate de locomotoras pequeñas (Clase «G» fig. 1) de locomotoras grandes (Clase «R» fig. 2) ambas para quemar leña o de locomotoras para utilizar carbón (Clase «N2» y «N3» fig. 7).

En las de clase «G», utilizadas de preferencia en maniobras, el chispero se encuentra en la chimenea estando constituído por tejido de alambre en la parte superior y por un dispositivo deflector de chispas; como chispero es eficáz en grado sumo y para lograr una evaporación mayor se mejora el tiraje con una campana angosta y baja.

En las de clase «R», utilizada en recorridos largos, el chispero lo constituye únicamente una doble malla de tejido de alambre en la parte superior de la chimenea, la malla inferior admitiendo un juego en sentido vertical para mantenerla libre de escorias.

Como chispero no es tan eficaz sacrificándose este aspecto para no disminuir su rendimiento.

En las locomotoras que queman carbón (Clase «N2» y «N3» fig. 7) el chispero se encuentra en la misma caja de humo constituído por un cono de alambre horizontal entre la campana y el caño de escape.

En algunos casos se encontró muy eficaz el empleo de un doble chispero: malla de alambre en la parte superior de la chimenea e idem. en la misma caja de humo (locomotoras clase «L»).

Otras modificaciones las constituyen un entramado de tubos de caldera soldados para aumentar la capacidad portante de leña de los tenders y una malla metálica entre tender y wagón adicional de leña para evitar que ésta caiga en la vía al ser pasada al tender.

CONCLUSIONES

Estimo útil la publicación del presente trabajo por comprender una serie de dispositivos que han dado excelentes resultados prácticos en aquellas locomotoras que debieron funcionar a leña o carbón.

RESOLUCION DEL CONGRESO

Se acuerda su publicación como trabajo informativo de instalación de dispositivos que dieron buenos resultados en la práctica.

TEMA 10

METODO PARA MODERNIZAR Y AUMENTAR LA EFICIENCIA DE LAS LOCOMOTORAS EN SERVICIO EN EL FERROCARRIL CENTRAL DEL URUGUAY.

AUTOR: *Señor THOMSON FAIRLESS.*
RELATOR: *Ingeniero JULIO ADER.*

63.

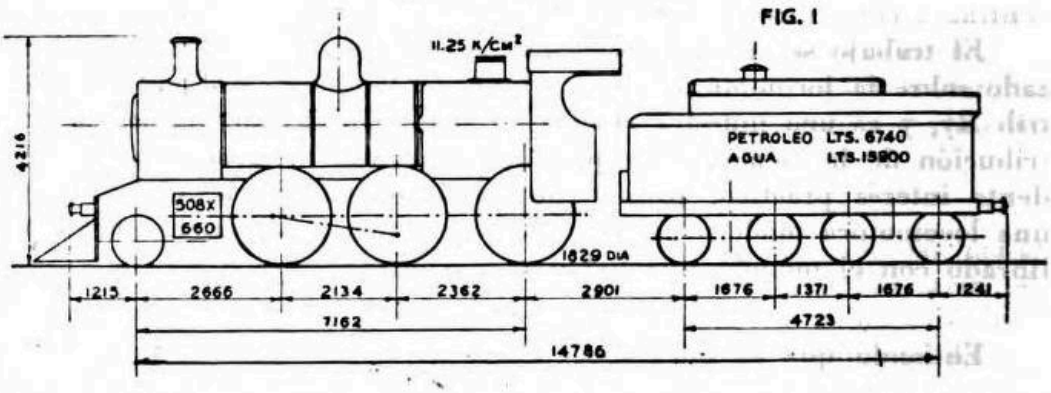
Las reformas y mejoras introducidas en tres clases de locomotoras están demostradas en los diagramas, gráficos y lista de características que acompañan el trabajo presentado, y por consiguiente no requieren explicaciones más amplias que las que siguen a continuación.

El diagrama (Fig. 1) muestra la locomotora clase «F» como fué construída antes de ser reformada a clase «T-1», diagrama (Fig. 2) .

La introducción de coches motores en algunos recorridos para servicio de pasajeros, desplazó estas locomotoras de dichos servicios, siendo también ineficaces para servicios de carga y mixtos por el diámetro excesivo de sus ruedas acopladas de 1,829 mts., por cuyo motivo fueron reformadas desde el tipo 2-6-0 a 2-8-0 con ruedas acopladas de 1,524 mts. de diámetro. Esta reforma ha permitido una reducción en

— CLASE F —
REFORMADA A CLASE T'

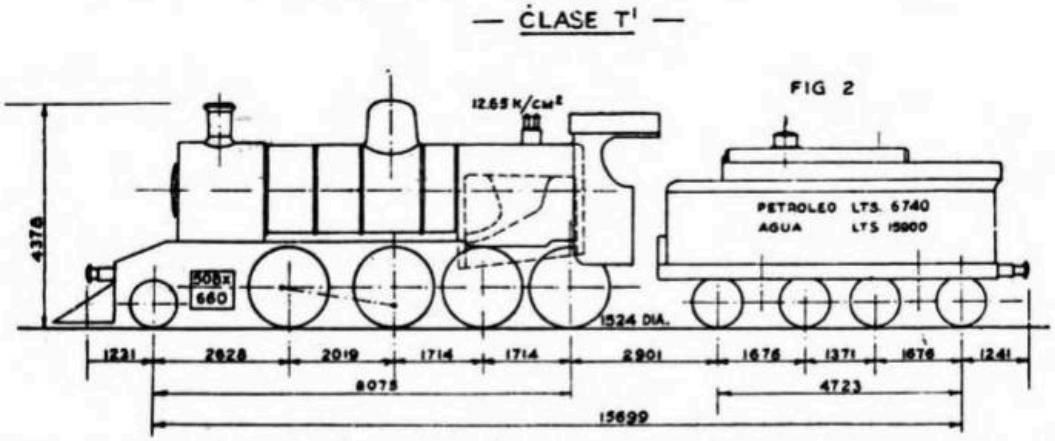
FIG. 1



el peso máximo por eje de las ruedas acopladas, desde 15,748 toneladas a 13,716 toneladas, resucción que también era deseable.

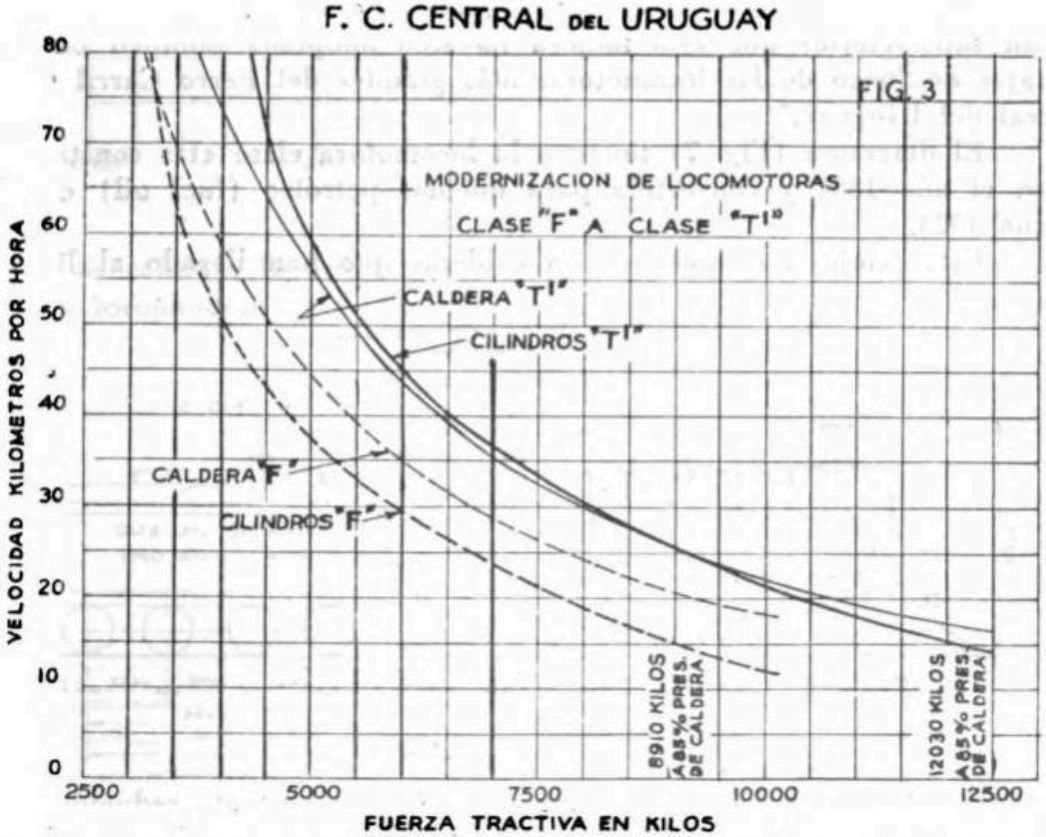
El aumento de la eficiencia de estas locomotoras se demuestra en el gráfico (Fig. 3), pudiéndose notar el equilibrio obtenido entre la fuerza tractiva de los cilindros existentes y las calderas con que fueron equipadas estas locomotoras al ser reformadas.

El diagrama (Fig. 4) muestra la locomotora clase «R», construída en el año 1907 y convertida para quemar petróleo (fuel oil) en el año 1923. El diagrama (Fig 5) muestra las locomotoras clase «R» reformadas



a clase «R-4» y el gráfico (Fig. 6) demuestra el aumento obtenido en la eficiencia de la misma.

Antes de ser reformadas, estas locomotoras estaban equipadas con cilindros que tenían válvulas de tipo plano, las cuales fueron cambia-



das por otras de diseño moderno con válvulas de tipo de pistón y recorrido largo.

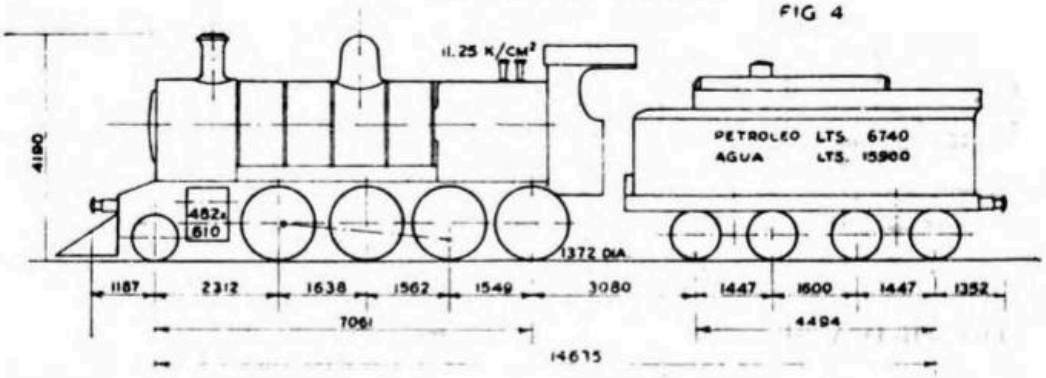
Las calderas fueron reemplazadas por otras del mismo tipo del que están equipadas las locomotoras clase «T-1» (clase «F» reformada) y son intercambiables desde una clase de locomotoras a otra.

Como se muestra en los diagramas (Figs. 2 y 5), estas calderas

— CLASE R —

REFORMADA A CLASE R⁴

FIG 4



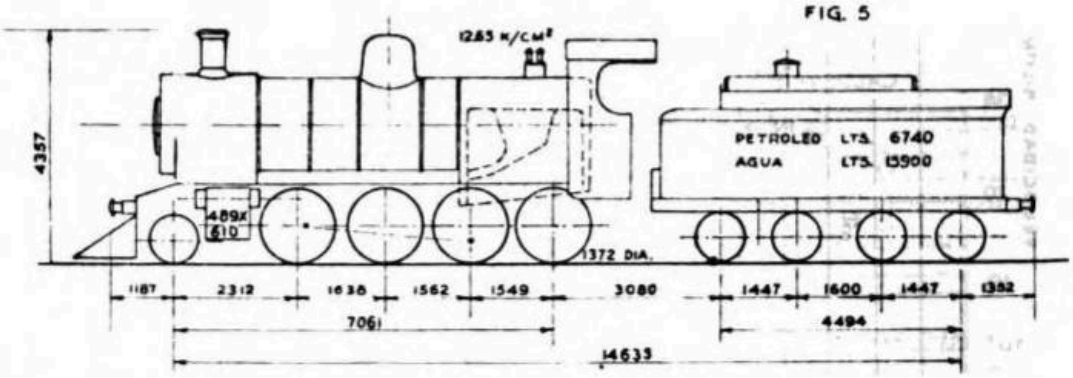
nuevas están equipadas con termo sifón «*Nicholson*» en la caja de fuego, una mejora que, además del aumento de superficie de calefacción, permite mejor circulación del agua, factores que han dado resultados tan satisfactorios que esta mejora ha sido adoptada también en las cajas de fuego de las locomotoras más grandes del Ferro Carril Central del Uruguay.

El diagrama (Fig. 7) muestra la locomotora clase «H» construída en el año 1884 y convertida para quemar petróleo (fuel oil) en el año 1923.

Estas viejas locomotoras, con calderas que han llegado al límite

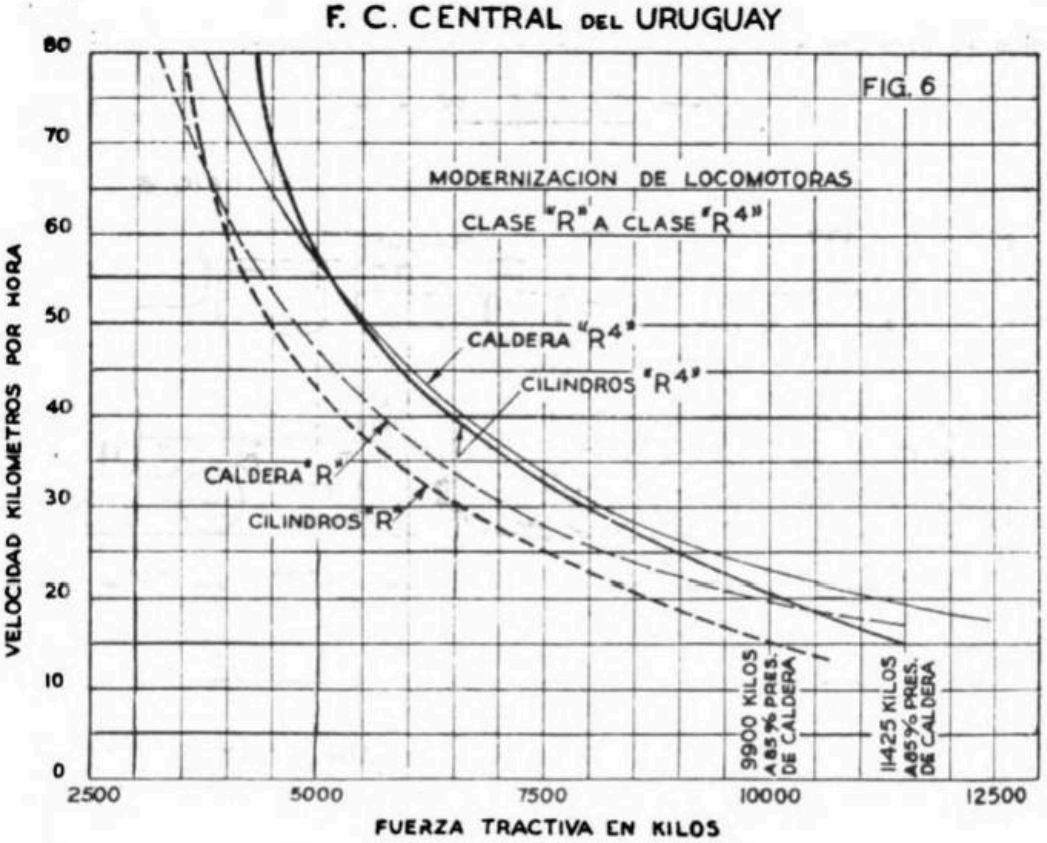
— CLASE R⁴ —

FIG. 5

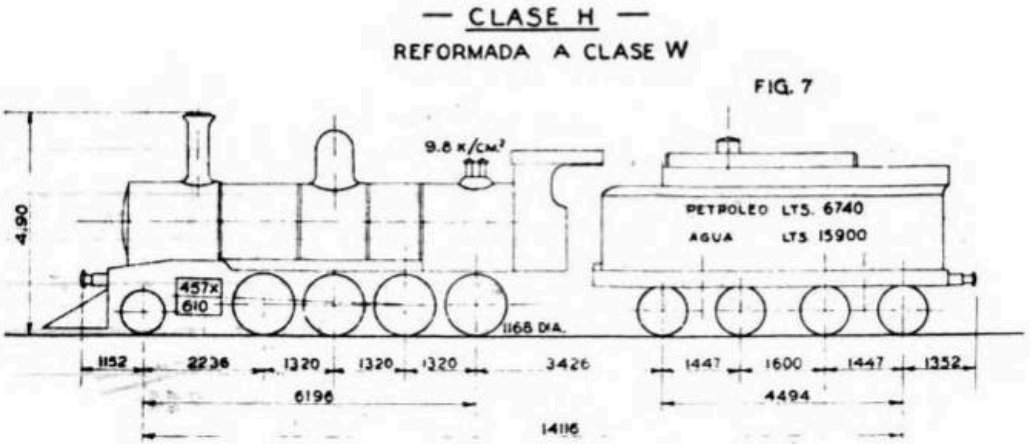


de su vida, y con ruedas acopladas de diámetro bastante reducido para sostener las velocidades exigidas para los trenes del tráfico de hoy, fueron reformadas para uso en las maniobras y trenes de balasto para mantenimiento de la vía, habiéndose aprovechado, para estas re-

formas, material usado, pero servible, de otras locomotoras reformadas o desmanteladas, con excepción de los tanques de agua y petróleo.



Las calderas fueron reemplazadas por otras que fueron retiradas de las locomotoras clase «R» al reformarlas a clase «R-4». El diagrama



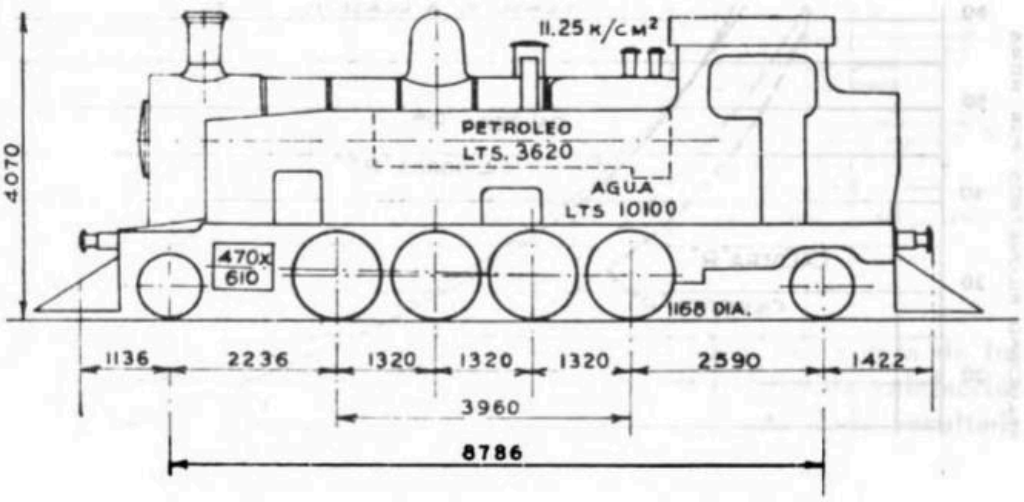
(Fig. 8) muestra las locomotoras después de la reforma, y el grafico (Fig. 9) demuestra el aumento obtenido en la eficiencia.

Accesorios para Locomotoras

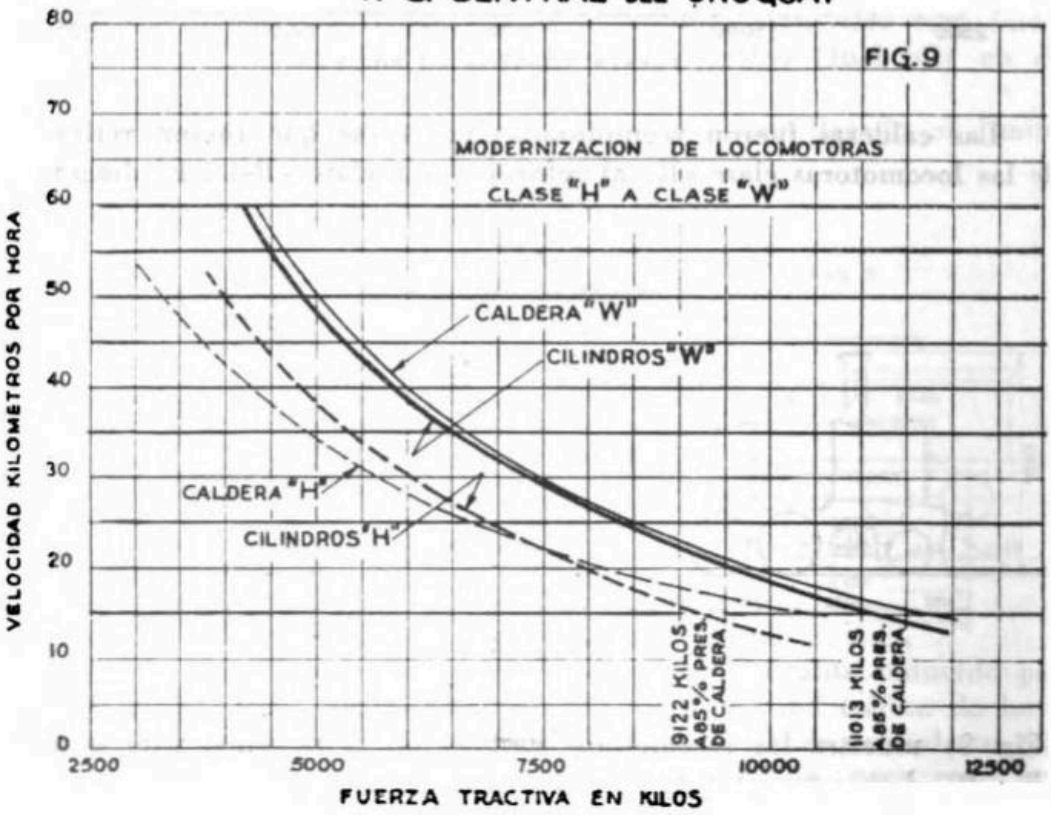
El constante desarrollo de la locomotora presenta nuevas ideas para el diseño y la aplicación de accesorios y equipo que pueden servir para mejorar la eficiencia de la misma ó reducir el costo de manteni-

— CLASE W —

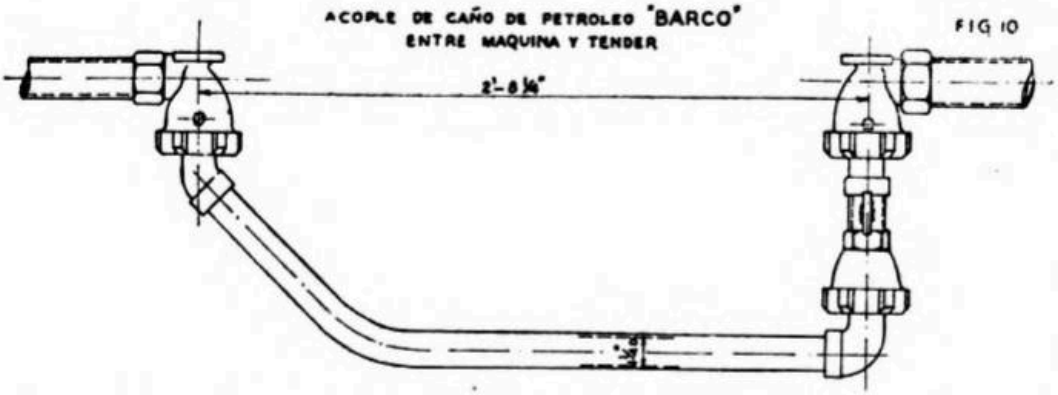
FIG. 8



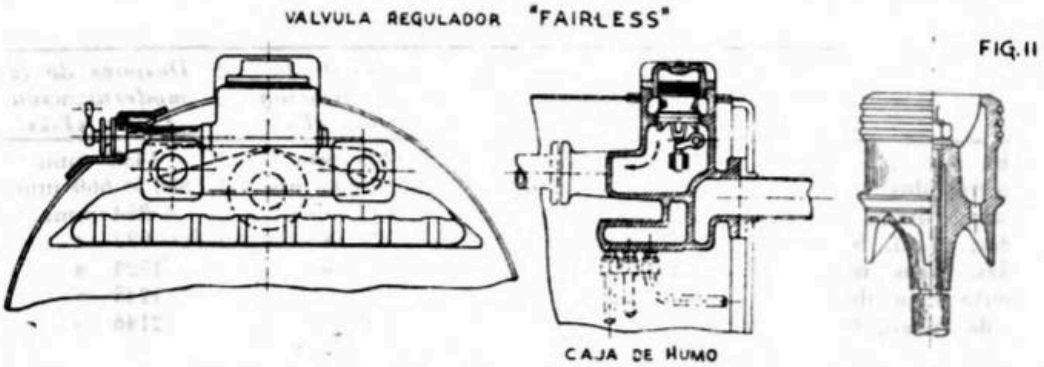
F. C. CENTRAL DEL URUGUAY



miento y es posible que el resultado de algunas «mejoras» no tiene valor si se las compara con su costo de instalación, mantenimiento y complicaciones introducidas y también es bien conocida la variación en el resultado que se obtiene en distintos Ferrocarriles con el uso de algunas de estas «mejoras». Por ejemplo, es difícil obtener una economía apreciable con el uso de inyectores de escape o con aparatos para elevar la temperatura del agua de alimentación de la caldera que fun-



cionan con vapor de escape, en algunos ferrocarriles donde existen vías con abundantes repechos y bajadas; también cuando las locomotoras así equipadas conducen trenes que tienen paradas frecuentes. Los tipos en uso en el Ferrocarril Central del Uruguay son limitados a cinco Inyectores de vapor de escape «Davies y Metcalfe» y dos aparatos calen-



tadores de agua de alimentación «Auxiliaire des Chemins de fer Company» (A. C. F. I.).

Los inconvenientes experimentados por las roturas de la conexión para la conducción de petroleo entre locomotora y tender, han sido eliminadas mediante la adopción del acople «*BARCO*» (Barco Manufacturing Company, Chicago). En la (Fig. 10) se ilustra la aplicación de uno de estos acoples, que permite una flexibilidad total para los diversos movimientos entre la locomotora y el tender.

Son conocidas en varios Ferrocarriles les ventajas obtenidas con la colocación de la válvula reguladora de vapor entre el recalentador y los cilindros, en lugar de colocarla entre la caldera y el recalentador.

El tipo en uso en algunas de las mas poderosas locomotoras del Ferrocarril Central del Uruguay, como en otros Ferrocarriles de Sud América, se encuentra ilustrado en la (Fig. 11) y es conocido como «*FAIRLESS*» Locomotive regulator valves (Meboe Limitada Londres).

La aplicación de estas válvulas entre el recalentador y los cilindros permite un control del vapor a los cilindros casi instantaneo y tal aplicación elimina la necesidad del uso de válvulas de circulación para los elementos del recalentador. Con tal arreglo, el uso de vapor recalentado puede ser extendido a varios auxiliares de la locomotora como el soplador, turbina del dinamo (luz eléctrica) el pulverizador (quemador de petroleo), calefacción del petroleo etc. con las economías que resultan. La experiencia con estas válvulas en servicio demuestra que no necesita atención en el intervalo entre una y otra reparación general de la locomotora y su desgaste es insignificante.

Debido a la pérdida de agua experimentada a veces con el uso de inyectores standard del tipo no aspirante (sumergido), el Ferrocarril Central del Uruguay ha introducido un número de inyectores del tipo aspirante, de la marca «*SELLERS*» Nº 8½ (clase «N» mejorada).

Los resultados obtenidos con esta mejora, han proporcionado entera satisfacción en todas las locomotoras que llevan tal equipo.

FERROCARRIL CENTRAL DEL URUGUAY

CARACTERISTICAS Y DIMENSIONES PRINCIPALES DE LOCOMOTORAS ANTES Y DESPUES DE LA MODERNIZACION

	Antes de la modernización Clase «F»	*Después de la modernización Clase «T-1»*
Trocha	1435 mm.	1435 mm.
Cilindros, dos	508 × 660 mm.	508 × 660 mm.
Válvulas, diám. (tipo pistón)	254 mm.	254 mm.
Ruedas, diám. bogie	927 »	927 »
Ruedas, diám. motora y acopladas	1829 »	1524 »
Cubierta caja de fuego, ancho externo	1245 »	1245 »
Caja de fuego, largo interno	2180 »	2146 »
Caja de fuego, ancho interno	1074 »	1042 »
Tubos grandes, nro. y diám. afuera	21-127 mm.	24-127 mm.
Tubos chicos, nro. y diám. afuera	134- 48 »	139- 48 »
Tubos del recalentador, nro. y diám. afuera	84- 35 »	96- 35 »
Superficie de calefacción		
Tubos grandes y chicos	106.37 m.²	118.73 m.²
Caja de fuego	11.56 »	11.70 »
Termo sifón	—	2.09 »
TOTAL	117.93 m.²	132.52 m.²
Superficie del recalentador	25.68 m.²	30.65 m.²
Area del emparrillado	2.32 »	2.23 »
Presión de la caldera	11.25 k/cm.²	12.65 k/cm.²
Fuerza de tracción a 85 % pres. caldera	8910 kilos	12030 kilos
Factor de adherencia	5.0	4.4

	Antes de la modernización Clase «R»	*Después de la modernización Clase «R-4»*
Trocha	1435 mm.	1435 mm.
Cilindros, dos	482 × 610 mm.	489 × 610 mm.
Válvulas, diám. (tipo pistón)	tipo plano	254 mm.
Ruedas, diám. bogie	851 mm.	851 »
Ruedas, diám. motora y acopladas	1372 »	1372 »
Cubierta caja de fuego, ancho externo	1245 »	1245 »
Caja de fuego, largo interno	2180 »	2146 »
Caja de fuego, ancho interno	1074 »	1042 »
Tubos grandes, nro. y diám. afuera	21-127 mm.	24-127 »
Tubos chicos, nro. y diám. afuera	134- 48 »	139- 48 »
Tubos del recalentador, nro. y diám. afuera	84- 35 »	96- 35 »
Superficie de calefacción		
Tubos grandes y chicos	110.64 m.²	118.73 m.²
Caja de fuego	11.56 »	11.70 »
Termo sifón	—	2.09 »
TOTAL	122.20 m.²	132.52 m.²
Superficie del recalentador	26.80 m²	30.65 m.²
Area del emparrillado	2.32 »	2.23 »
Presión de la caldera	11.25 k/cm.²	12.65 k/cm.²
Fuerza de tracción a 85 % pres. caldera	9900 kilos	11325 kilos
Factor de adherencia	4.55	4.4

	Antes de la modernización Clase «H»	*Después de la modernización Clase «W»*
Trocha	1435 mm.	1435 mm.
Cilindros, dos	457 × 610 mm.	470 × 610 mm.
Válvulas, diám. (tipo pistón)	tipo plano	tipo plano
Ruedas, diám bogie	838 mm.	838 mm.
Ruedas, diám. motora y acopladas	1168 »	1168 »
Cubierta caja de fuego, ancho externo	1232 »	1245 »
Caja de fuego, largo interno	1824 »	2180 »
Caja de fuego, ancho interno	1051 »	1074 »
Tubos grandes, nro. y diám. afuera	—	21 127 mm.
Tubos chicos, nro. y diám. afuera	171-48 mm.	134- 48 »
Tubos del recalentador, nro. y diám. afuera	—	84- 35 »
Superficie de calefacción		
Tubos grandes y chicos	99.58 m.²	110.64 m.²
Caja de fuego	9.29 »	11.56 »
Termo sifón	—	—
TOTAL	108.87 m.²	122.20 m.²
Superficie del recalentador	—	19.5 m.²
Area del emparrillado	1.86 m²	2.32 »
Presión de la caldera	9.8 k/cm.²	11.25 k/cm.²
Fuerza de tracción a 85 % pres. caldera	9122 kilos	11013 kilos
Factor de adherencia	4.39	4.97

INFORME DEL RELATOR

Presenta el autor las modificaciones efectuadas en tres clases de locomotoras del Ferrocarril Central del Uruguay con el doble objeto de mejorar su eficiencia y adaptarlas a las actuales necesidades del tráfico.

Estas modificaciones pueden dividirse en dos partes:

a) En una primera parte están comprendidas las efectuadas en el generador de vapor, en el cilindro motor y en el rodado.

b) En una segunda parte quedan comprendidas las mejoras introducidas en los accesorios.

Modificaciones a)

Es de destacar en términos generales que además de lograrse una mayor eficiencia se ha conseguido una casi coincidencia en las dos curvas velocidad- esfuerzo tractivo de la caldera y de los cilindros (ver fig. 3, 6 y 9).

Se ha ido a un aumento de la superficie de calefacción y al consecuente aumento de área del recalentador; también se ha elevado el timbre de la caldera. Es de hacer notar la adopción del sifón térmico con la doble finalidad de aumentar la superficie calefactora y mejorar la circulación del agua en la caldera.

En estas modificaciones introducidas en la caldera es donde radica primordialmente el aumento de la eficiencia. Las variaciones hechas en las dimensiones de las ruedas motoras y acopladas y en el cilindro motor han sido fijadas por las condiciones impuestas por el nuevo destino en el tráfico de la locomotora y por el propósito de lograr la coincidencia de las curvas de las figuras 3, 6 y 9 ya señaladas: lograr en el cilindro la potencia de que se dispone en la caldera. Así por ejemplo, en la modificación de clase «F» a clase «T-1» se tuvo que reducir el diámetro de las ruedas motoras y acopladas al destinarse a trenes de mercancias; se mantuvo el mismo diámetro del cilindro.

En cambio en las modificaciones de las clases «R» a «R-4» y «H» a «W» en que tuvo que mantenerse el diámetro de las ruedas motoras y acopladas se aumentó el diámetro del cilindro.

En la modificación de clase «R» a «R-4», el cambio de válvula distribuidora plana por el de tipo cilíndrico mejora notoriamente el rendimiento orgánico de la locomotora.

Modificaciones b)

El autor destaca que el empleo de inyectores aspirantes y de aparatos precalentadores del agua de alimentación solo configuran una real economía cuando no existen abundantes bajadas y repechos ni frecuentes paradas, es decir, cuando las condiciones de operación imponen a tales aparatos un mayor lapso en funcionamiento.

Recomienda la mayor flexibilidad posible en la conexión entre máquina y tender para conducción del fuel-oil para evitar roturas.

Son notables las ventajas del cambio de ubicación de la válvula reguladora: colocarla entre el recalentador y los cilindros en vez de colocarla entre la caldera y el recalentador.

CONCLUSIONES

Me permito recomendar la publicación de este trabajo en los Anales del Congreso por los valiosos aportes a la solución de uno de los problemas más importantes de toda explotación ferroviaria: el aumento en la eficiencia de las locomotoras y la readaptación de las mismas a otros destinos en la explotación.

RESOLUCION DEL CONGRESO

Se acuerda su publicación en las Memorias del Congreso por su útil aporte informativo.

9.9 Index of locos by builders

Works no.	Year	Wheels	Gauge	Owner and number and name	Section
				Avonside	
1032-3	1874	0-6-6-0	Std.	*FCyT del Norte de Montevideo* **'MONTEVIDEO'**	9.1.4
1034-5	1874	0-6-6-0	Std.	*FCyT del Norte de Montevideo* **'SANTA LUCIA'**	9.1.4
				Bagnall	
1896	1909	0-4-0T	50cm	Construction of CUR Eastern Extension Railway **?**	9.5.5
1897	1909	0-4-0T	50cm	Construction of CUR Eastern Extension Railway **?**	9.5.5
1898	1909	0-4-0T	50cm	Construction of CUR Eastern Extension Railway **?**	9.5.5
1913	1909	0-4-0T	50cm	Construction of CUR Eastern Extension Railway **?**	9.5.5
				Baldwin	
10411	1890	4-4-0	Std.	Central Uruguay Railway WER **1**, later to CUR **86**	9.1.7
10412	1890	4-4-0	Std.	Central Uruguay Railway WER **2**, later to CUR **87**	9.1.7
10417	1890	4-4-0	Std.	Central Uruguay Railway WER **3**, later to CUR **79**	9.1.7
10485	1890	4-4-0	Std.	Central Uruguay Railway WER **4**, later to CUR **80**	9.1.7
10486	1890	4-4-0	Std.	Central Uruguay Railway WER **5**, later to CUR **81**	9.1.7
10487	1890	4-4-0	Std.	Central Uruguay Railway WER **6**, later to CUR **82**	9.1.7
10488	1890	4-4-0	Std.	Central Uruguay Railway WER **7**, later to CUR **83**	9.1.7
10489	1890	4-4-0	Std.	Central Uruguay Railway WER **8**, later to CUR **84**	9.1.7
10491	1890	4-4-0	Std.	Central Uruguay Railway WER **9**, later to CUR **85**	9.1.7
39689	1913	0-6-0	Std.	Uruguay Railway **1**, thence to *FTE* **16**	9.1.9
39690	1913	0-6-0	Std.	Uruguay Railway **2**, thence to *FTE* **17**	9.1.9
				Beyer Peacock	
1424	1874	2-4-0	Std.	Waring Bros, Montevideo, for CUR **17 'SAN JOSÉ'**	9.1.7
1425	1874	2-4-0	Std.	Waring Bros, Montevideo, for CUR **18 'HYGUERITAS'**	9.1.7
2111	1881	2-6-0	Std.	Central Uruguay Railway **19**	9.1.7
2112	1881	2-6-0	Std.	Central Uruguay Railway **20**	9.1.7
2113	1881	2-6-0	Std.	Central Uruguay Railway **21**	9.1.7
2512	1884	2-8-0	Std.	Central Uruguay Railway **22**	9.1.7
2513	1884	2-8-0	Std.	Central Uruguay Railway **23**	9.1.7
2514	1884	2-8-0	Std.	Central Uruguay Railway **24**	9.1.7
2916	1887-8	2-6-0	Std.	North Eastern Uruguay Railway, became CUR **34**	9.1.2
2917	1887-8	2-6-0	Std.	North Eastern Uruguay Railway, became CUR **35**	9.1.2
2918	1887-8	2-6-0	Std.	North Eastern Uruguay Railway, became CUR **36**	9.1.2
2943	1887-8	2-6-0	Std.	North Eastern Uruguay Railway, became CUR **37**	9.1.2
2996	1888	2-6-0	Std.	Central Uruguay Railway **25**	9.1.7
2997	1888	2-6-0	Std.	Central Uruguay Railway **26**	9.1.7
2998	1889	2-6-0	Std.	Central Uruguay Railway **27**	9.1.7
3006	1889	2-6-0	Std.	Uruguay Midland Railway **3**	9.1.6
3007	1889	2-6-0	Std.	Uruguay Midland Railway **4**	9.1.6
3008	1889	2-6-0	Std.	Uruguay Midland Railway **5**	9.1.6
3009	1889	2-6-0T	Std.	Uruguay Midland Railway **6,**	9.1.6

				then to *FTE* in 1898	9.1.11
3010	1889	2-6-0T	Std.	Uruguay Midland Railway **7,**	9.1.6
				then to *FTE* in 1898	9.1.11
3011	1889	2-6-0T	Std.	Uruguay Midland Railway **8,**	9.1.6
				then to CUR in 1899 **4**	9.1.7
3030	1889	2-6-0	Std.	Central Uruguay Railway **28**	9.1.7
3031	1889	2-6-0	Std.	Central Uruguay Railway **29**	9.1.7
3032	1889	2-6-0	Std.	Central Uruguay Railway **30**	9.1.7
3033	1889	2-6-0	Std.	Central Uruguay Railway EER **31**	9.1.7
3034	1889	2-6-0	Std.	Central Uruguay Railway EER **32**	9.1.7
3035	1889	2-6-0	Std.	Central Uruguay Railway EER **33**	9.1.7
3295	1891	4-4-0	Std.	Central Uruguay Railway **57**	9.1.7
3296	1891	4-4-0	Std.	Central Uruguay Railway **58**	9.1.7
3297	1891	4-4-0	Std.	Central Uruguay Railway **59**	9.1.7
3298	1891	4-4-0	Std.	Central Uruguay Railway **60**	9.1.7
3299	1891	4-4-0	Std.	Central Uruguay Railway **61**	9.1.7
3300	1891	4-4-0	Std.	Central Uruguay Railway **62**	9.1.7
3627	1895	2-6-0	Std.	Central Uruguay Railway **63**	9.1.7
3628	1895	2-6-0	Std.	Central Uruguay Railway **64**	9.1.7
3634	1895	2-6-0	Std.	Central Uruguay Railway **65**	9.1.7
3635	1895	2-6-0	Std.	Central Uruguay Railway **66**	9.1.7
3636	1895	2-6-0	Std.	Central Uruguay Railway **67**	9.1.7
3861	1896	2-6-0	Std.	Central Uruguay Railway **68**	9.1.7
3862	1896	2-6-0	Std.	Central Uruguay Railway **69**	9.1.7
3863	1896	2-6-0	Std.	Central Uruguay Railway **70**	9.1.7
3864	1896	2-6-0	Std.	Central Uruguay Railway **71**	9.1.7
3865	1896	2-6-0	Std.	Central Uruguay Railway **72**	9.1.7
4201	1900	2-6-0	Std.	Central Uruguay Railway **73**	9.1.7
4202	1900	2-6-0	Std.	Central Uruguay Railway **74**	9.1.7
4203	1900	2-6-0	Std.	Central Uruguay Railway **75**	9.1.7
4204	1900	2-6-0	Std.	Central Uruguay Railway **76**	9.1.7
4205	1900	2-6-0	Std.	Central Uruguay Railway **77**	9.1.7
4206	1900	2-6-0	Std.	Central Uruguay Railway **78**	9.1.7
4560	1903	2-6-0T	Std.	*FCyT del Norte de Montevideo* **'ABASTO'**, thence to	9.1.4
				FTE **12 '?'**	9.1.11
4561	1903	2-6-0	Std.	Uruguay Midland Railway **8**	9.1.6
4734	1905	2-6-0T	Std.	*FCyT del Norte de Montevideo* **'MONTEVIDEO'**,	9.1.4
				thence to *FTE* **3 'MONTEVIDEO'**	9.1.11
4744	1905	2-6-0T	Std.	Central Uruguay Railway **1**[2]	9.1.7
4745	1905	2-6-0T	Std.	Central Uruguay Railway **2**[2]	9.1.7
4746	1906	2-6-0	Std.	Central Uruguay Railway **88**	9.1.7
4747	1906	2-6-0	Std.	Central Uruguay Railway **89**	9.1.7
4748	1906	2-6-0	Std.	Central Uruguay Railway **90**	9.1.7
4749	1906	2-6-0	Std.	Central Uruguay Railway **91**	9.1.7
4750	1906	2-6-0	Std.	Central Uruguay Railway **92**	9.1.7
4751	1906	2-6-0	Std.	Central Uruguay Railway **93**	9.1.7
4941	1907	2-6-0	Std.	Central Uruguay Railway **94**	9.1.7
4942	1907	2-6-0	Std.	Central Uruguay Railway **95**	9.1.7

4943	1907	2-6-0	Std.	Central Uruguay Railway **96**	9.1.7
4944	1907	2-6-0	Std.	Central Uruguay Railway **97**	9.1.7
4945	1907	2-6-0	Std.	Central Uruguay Railway **98**	9.1.7
4946	1907	2-6-0	Std.	Central Uruguay Railway **99**	9.1.7
4947	1907	2-6-0	Std.	Central Uruguay Railway **100**	9.1.7
4948	1907	2-6-0	Std.	Central Uruguay Railway **101**	9.1.7
4949	1907	2-6-0	Std.	Central Uruguay Railway **102**	9.1.7
4950	1907	2-6-0	Std.	Central Uruguay Railway **103**	9.1.7
4951	1907	2-6-0	Std.	Central Uruguay Railway **104**	9.1.7
4952	1907	2-6-0	Std.	Central Uruguay Railway **105**	9.1.7
4953	1907	2-6-0	Std.	Central Uruguay Railway **106**	9.1.7
4954	1907	2-6-0	Std.	Central Uruguay Railway **107**	9.1.7
4955	1907	2-6-0	Std.	Central Uruguay Railway **108**	9.1.7
4956	1907	2-8-0	Std.	Central Uruguay Railway **109**	9.1.7
4957	1907	2-8-0	Std.	Central Uruguay Railway **110**	9.1.7
4958	1907	2-8-0	Std.	Central Uruguay Railway **111**	9.1.7
5152	1908	2-6-0	Std.	Uruguay Midland Railway **15**, became CUR **176**	9.1.6
5153	1908	2-6-0	Std.	Uruguay Midland Railway **16**, became CUR **177**	9.1.6
5324	1909	2-6-2T	Std.	*FCyT del Norte de Montevideo* **'PROGRESO'**, thence to *FTE* **15 'PROGRESO'**	9.1.4 9.1.11
5325	1910	2-6-0	Std.	Uruguay Midland Railway **17**, became CUR **178**	9.1.6
5326	1910	2-6-0	Std.	Uruguay Midland Railway **18**, became CUR **179**	9.1.6
5383	1911	2-6-0	Std.	Uruguay Midland Railway **19**, became CUR **180**	9.1.6
5394	1910	2-6-0T	Std.	Central Uruguay Railway **17**	9.1.7
5395	1910	2-6-0	Std.	Central Uruguay Railway **115**	9.1.7
5396	1910	2-6-0	Std.	Central Uruguay Railway **116**	9.1.7
5397	1910	2-6-0	Std.	Central Uruguay Railway **117**	9.1.7
5398	1910	2-6-0	Std.	Central Uruguay Railway **118**	9.1.7
5399	1910	2-6-0	Std.	Central Uruguay Railway **119**	9.1.7
5400	1910	2-6-0	Std.	Central Uruguay Railway **120**	9.1.7
5401	1910	2-6-0	Std.	Central Uruguay Railway **121**	9.1.7
5402	1910	2-6-0	Std.	Central Uruguay Railway **122**	9.1.7
5403	1910	2-8-0	Std.	Central Uruguay Railway **112**	9.1.7
5404	1910	2-8-0	Std.	Central Uruguay Railway **113**	9.1.7
5405	1910	2-8-0	Std.	Central Uruguay Railway **114**	9.1.7
5406	1911	2-6-0	Std.	Uruguay Midland Railway **20**, became CUR **181**	9.1.6
5414	1910	2-8-0	Std.	Central Uruguay Railway **123**	9.1.7
5415	1910	2-8-0	Std.	Central Uruguay Railway **124**	9.1.7
5416	1910	2-8-0	Std.	Central Uruguay Railway **125**	9.1.7
5533	1912	2-6-0	Std.	Uruguay Midland Railway **21**, became CUR **182**	9.1.6
5534	1912	2-6-0	Std.	Uruguay Midland Railway **22**, became CUR **183**	9.1.6
5763	1914	2-8-0	Std.	Central Uruguay Railway **126**	9.1.7
5764	1914	2-8-0	Std.	Central Uruguay Railway **127**	9.1.7
5765	1914	2-8-0	Std.	Central Uruguay Railway **128**	9.1.7
5766	1914	2-8-0	Std.	Central Uruguay Railway **129**	9.1.7
5767	1914	2-8-0	Std.	Central Uruguay Railway **130**	9.1.7
5768	1914	2-8-0	Std.	Central Uruguay Railway **131**	9.1.7
5769	1914	2-6-0	Std.	Central Uruguay Railway **132**, rebuilt to 2-8-0	9.1.7

5770	1914	2-6-0	Std.	Central Uruguay Railway **133**, rebuilt to 2-8-0	9.1.7
5771	1914	2-6-0	Std.	Central Uruguay Railway **134**, rebuilt to 2-8-0	9.1.7
5772	1914	2-6-0	Std.	Central Uruguay Railway **135**, rebuilt to 2-8-0	9.1.7
5773	1914	2-6-0	Std.	Central Uruguay Railway **136**, rebuilt to 2-8-0	9.1.7
5774	1914	2-6-0	Std.	Central Uruguay Railway **137**, rebuilt to 2-8-0	9.1.7
6093	1921	2-6-0	Std.	Central Uruguay Railway **138**, rebuilt to 2-8-0	9.1.7
6094	1921	2-6-0	Std.	Central Uruguay Railway **139**, rebuilt to 2-8-0	9.1.7
6095	1921	2-6-0	Std.	Central Uruguay Railway **140**, rebuilt to 2-8-0	9.1.7
6096	1921	2-6-0	Std.	Central Uruguay Railway **141**, rebuilt to 2-8-0	9.1.7
6547	1929	2-6-0	Std.	*FTE* **22**	9.1.11
6548	1929	2-6-0	Std.	*FTE* **23**	9.1.11
6549	1929	2-6-0	Std.	*FTE* **24**	9.1.11
6599	1929	2-6-0	Std.	*FTE* **25**	9.1.11
6600	1929	2-6-0	Std.	*FTE* **26**	9.1.11
6601	1929	2-6-0	Std.	*FTE* **27**	9.1.11
6574	1929	2-8-0	Std.	Central Uruguay Railway **148**	9.1.7
6575	1929	2-8-0	Std.	Central Uruguay Railway **149**	9.1.7
6576	1929	2-8-0	Std.	Central Uruguay Railway **150**	9.1.7
6577	1929	2-8-0	Std.	Central Uruguay Railway **151**	9.1.7

Black Hawthorn

922	1887	0-6-0T	Std.	Midland Railway contractor **1 'QUEGUAY'**,	9.1.6
				then to *FCyT del Norte de Montevideo* **'QUEGUAY'**	9.1.4
923	1887	0-6-0T	Std.	Midland Railway contractor **2 'DAYMAN'**,	9.1.6
				then to Uruguay Midland Railway **?**	
943	1888	0-4-0T	2' 0"	Goldfields of Uruguay Ltd. **'CLOTILDE'**	9.5.6
959	1888	0-6-0ST	Metre	James Perry & Co., then Medici y Cía. **?**	9.3.1 / 9.6.14
997	1890	0-4-0ST	Std.	Uruguay East Coast Railway **13**	9.1.5

Alexander Chaplin & Co.

?	1870s-80s	0-4-0VB	3' 0"?	*Nac. Admin. del Pto. de Montevideo* **?**	9.5.1

Clyde Locomotive Co.

29	1886-8	2-6-0	Std.	Midland Uruguay Railway **1**	9.1.6
30	1886-8	2-6-0	Std.	Midland Uruguay Railway **2**	9.1.6

Locos ordered from Clyde but actually built by Sharp Stewart after their purchase of Clyde's works in Glasgow. See below.

Couillet

864	1886	0-4-0T	60cm	T. A. Walker at Conchillas **'CONCHILLAS'**	9.6.5

James Cross

28	1868	0-6-6-0	Std.	S&WR of Queensland, then reconstructed and sold to	
				Central Uruguay Railway **15**	9.1.7
30	1868	0-6-6-0	Std.	S&WR of Queensland, then reconstructed and sold to	
				Uruguay Railway **16**	9.1.7

Decauville

526	1909	0-4-0T	50cm	*Enterprise General des Travaux du Port de Montevideo* **1A**?	9.5.1
				later to *Indare SA* at Boca de Rosario **1A**	9.5.2

Dübs

2484	1889	2-6-0	Std.	Uruguay Northern Railway **1**	9.1.3
2485	1889	2-6-0	Std.	Uruguay Northern Railway **2**	9.1.3
3390	1896	2-6-0	Std.	Uruguay Northern Railway **3**	9.1.3
2778	1891	4-4-0T	Std.	UECR **1 'OLMOS'** but not delivered, went to Highland Railway	9.1.2
2779	1891	4-4-0T	Std.	UECR **2 '?'** but not delivered, went to Highland Railway	9.1.2

Falcon

179	1890	2-6-0T	Std.	Uruguay Northern Railway **4**, then to CUR as **6**	9.1.3
180	1890	2-6-0T	Std.	Uruguay Northern Railway **5**, then to CUR as **7**	9.1.3

R. & W. Hawthorn / Leslie

2179	1890	0-6-0T	Std.	North Western Uruguay Railway **2 'LONDRES'**	9.1.1
2238	1892	0-6-0T	Std.	????, then to *FTE* **9 'VARDIA'**	9.2.5
2320	1895	4-4-0	Std.	*FCyT del Norte de Montevideo* **'OLMOS'**, thence to	9.2.1
				FTE **1 'OLMOS'**	9.2.5
2321	1895	4-4-0	Std.	*FCyT del Norte de Montevideo* **'MOSQUITOS'**, thence to	9.2.1
				FTE **2 'MOSQUITOS'**	9.2.5
2693	1907	2-6-0	Std.	Uruguay East Coast Railway **4 'SAN CARLOS'**, thence to	9.2.2
				FTE **4 'SAN CARLOS'**	9.2.5
2759	1908	2-6-2T	Std.	Uruguay East Coast Railway **5 'PAN de AZUCAR'**, thence	9.2.2
				to *FTE* **5 'PAN de AZUCAR'**	9.2.5
2816	1910	2-6-0	Std.	Uruguay East Coast Railway **6 'SOLIS'**, thence to	9.2.2
				FTE **6 'SOLIS'**	9.2.5
2873	1911	2-6-0	Std.	Uruguay East Coast Railway **7 'MALDONADO'**, thence to	9.2.2
				FTE **7 'MALDONADO'**	9.2.5
2942	1912	0-6-0T	Std.	North Western Uruguay Railway **17 'MONTEVIDEO'**	9.1.1
3033	1914	2-6-0	Std.	Uruguay East Coast Railway **8 'ROCHA'**, thence to	9.2.2
				FTE **8 'ROCHA'**	9.2.5
3447	1921	2-8-0	Std.	Central Uruguay Railway **142**	9.1.7
3448	1921	2-8-0	Std.	Central Uruguay Railway **143**	9.1.7
3449	1921	2-8-0	Std.	Central Uruguay Railway **144**	9.1.7
3450	1921	2-8-0	Std.	Central Uruguay Railway **145**	9.1.7
3451	1921	2-8-0	Std.	Central Uruguay Railway **146**	9.1.7
3452	1921	2-8-0	Std.	Central Uruguay Railway **147**	9.1.7

Henschel

19254	1922	0-4-0T	60cm	*Indare SA* **23**	9.5.2
20750	1926	0-6-0T	75cm	*Cía. General de Obras Públicas* in Buenos Aires. This company brought several locos, including three of this type, to Uruguay for the Rincón del Bonete dam project in the 1930s.	9.5.7
21144	1929	0-4-0T	60cm	*Indare SA* **13**	9.5.2

25052	1950	2-10-0	Std.	Central Uruguay Railway **156**	9.1.7
25053	1950	2-10-0	Std.	Central Uruguay Railway **157**	9.1.7
25054	1950	2-10-0	Std.	Central Uruguay Railway **158**	9.1.7
25055	1950	2-10-0	Std.	Central Uruguay Railway **159**	9.1.7
25056	1950	2-10-0	Std.	Central Uruguay Railway **160**	9.1.7
28518	1950	0-4-0T	60cm	*Indare SA* **25**	9.5.2
28519	1950	0-4-0T	60cm	*Indare SA* **26**	9.5.2

Hudswell Clarke

432	1895	0-4-0T	Std.	Uruguay Midland Railway **9**	9.1.6
453	1896	4-4-2T	Std.	North Western Uruguay Railway **12 'PRESIDENTE'**	9.1.1
454	1896	4-4-2T	Std.	North Western Uruguay Railway **13 'ORIENTAL'**	9.1.1
481	1898	4-4-0	Std.	Uruguay Midland Railway **10**	9.1.6
482	1898	4-4-0	Std.	Uruguay Midland Railway **11**	9.1.6
741	1906	2-6-0	Std.	Uruguay Midland Railway **13**, became CUR **174**	9.1.6
742	1906	2-6-0	Std.	Uruguay Midland Railway **14**, became CUR **175**	9.1.6
743	1906	0-4-0T	Std.	Uruguay Midland Railway **12**	9.1.6
778	1906	2-6-0T	Std.	Central Uruguay Railway **15**[3]	9.1.7
779	1906	2-6-0T	Std.	Central Uruguay Railway **16**[3]	9.1.7
824	1908	0-6-0T	Std.	Uruguay Northern Railway **5 'SALTO'**	9.1.3

Hunslet

107	1873-4	0-6-0T	Std.	North Western Railway **2 'SANTA ROSA'**	9.1.1
108	1873-4	0-6-0T	Std.	North Western Railway **3**[1] **'URUGUAY'**, later to	9.1.1
				Uruguay Midland Railway **31**	9.1.6
109	1873-4	0-6-0T	Std.	North Western Railway **4**[1] **'ARAPEY'**, later to	9.1.1
				Uruguay Midland Railway **32**	9.1.6
110	1873-4	0-6-0T	Std.	North Western Railway **5 'ITAPEBI'**	9.1.1
122	1873-4	0-6-0T	Std.	North Western Railway **6 'APAPY'**	9.1.1
443	1888	0-4-0ST	Std.	T. A. Walker at Conchillas **'GILMOUR'**	9.5.11
465	1888	0-6-0ST	Std.	T. A. Walker at Conchillas **'CHAVARRÍA'**	9.5.11
795	1903	4-4-2T	Std.	North Western Railway **14 'AMERICA'**	9.1.1
803	1903	4-4-2T	Std.	North Western Railway **15 'EUROPE'**	9.1.1
833	1903	4-4-2T	Std.	North Western Railway **16 'AFRICA'**	9.1.1
1052	1911	4-6-0T	Std.	North Western Railway **3**[2] **'URUGUAY'**	9.1.1
1070	1911	4-6-0T	Std.	North Western Railway **4**[2] **'ARAPEY'**	9.1.1

Jung

449	1900	0-4-0T	60cm	*Indare SA* **14**	9.5.2
3849	1927	0-4-0T	60cm	*Indare SA* **21**	9.5.2
3850	1927	0-4-0T	60cm	*Indare SA* **11**	9.5.2
3979	1927	0-4-0T	60cm	*Indare SA* **9**	9.5.2
3980	1927	0-4-0T	60cm	*Indare SA* **10**	9.5.2
4248	1928	0-4-0T	60cm	*Indare SA* **20**	9.5.2
4249	1928	0-4-0T	60cm	*Indare SA* **12**	9.5.2
4252	1929	0-4-0T	60cm	*Indare SA* **19**	9.5.2

Kerr Stuart

1196	1912	0-6-0T	Std.	Uruguay Railway **?**, thence to *FTE* **18**	9.1.9

Krauss

5718	1907	0-4-0T	60cm	*Indare SA* **18**	9.5.2
?	19??	0-4-0T	60cm	*Indare SA* **16**	9.5.2
?	19??	0-4-0T	60cm	*Indare SA* **17**	9.5.2

Lima

1154	1911	0-4-2T	Std.	Pan American Trans-continental Railway **1**, thence to	9.1.10
				FTE **19**	9.1.11
1155	1911	2-6-2T	Std.	Pan American Trans-continental Railway **2**?, thence to	9.1.10
				FTE **10**	9.1.11
1156	1911	2-6-2T	Std.	Pan American Trans-continental Railway **3**?, thence to	9.1.10
				FTE **11**	9.1.11
1157	1911	2-6-0	Std.	Pan American Trans-continental Railway **4**, thence to	9.1.10
				FTE **20**	9.1.11
1158	1911	2-6-0	Std.	Pan American Trans-continental Railway **5**, thence to	9.1.10
				FTE **21**	9.1.11
1777	1906	2 truck Shay	60cm	Superviele & Co. **1 'DOMINGO de ARCE'**	9.6.2

Linke Hofmann

2669	1925	0-4-0WT	Std.?	*Nac. Admin. del Pto. de Montevideo* **4**	9.5.1
2670	1925	0-4-0WT	Std.?	*Nac. Admin. del Pto. de Montevideo* **5**	9.5.1

Manning Wardle

235	1867	0-6-0ST	Std.	Central Uruguay Railway **1 'GENERAL FLORES'**	9.1.1
245	1868	0-6-0	Std.	Uruguay Co. then CUR **3 'MONTEVIDEO'**	9.1.1
251	1868	0-6-0	Std.	Uruguay Co. then CUR **4 'Las PIEDRAS'**	9.1.1
300	1870	0-6-0ST	Std.	Central Uruguay Railway **2 'CANELONES'**, thence to	9.1.1
				Agencia Nacional del Puertos **3**	9.5.1
395	1872	0-6-0ST	Std.	North Western Uruguay Railway **1 'SALTO'**	9.1.1
634?	1877	2-4-0T	Std.	North Western Uruguay Railway, **11 'HESKETH**?'	
				later **? 'CRIOLLO'**	9.1.1
956	1886	0-6-0ST	Std.	Lucas Gonzales y Cía., Concepción del Uruguay **'CONCORDIA'**	
988	1888	0-4-0ST	Std.	T. A. Walker at Conchillas **'YRIGOYEN'**	9.5.11
1015	1887	0-4-0ST	Std.	T. A. Walker at Conchillas **'ORTIZ'**	9.5.11
1032	1888	0-6-0ST	Std.	T. A. Walker at Conchillas **'THORNTON'**	9.5.11
1045	1888	0-6-0ST	Std.	North Eastern Uruguay Railway **1**, became CUR **42**	9.1.2
1093	1888	0-6-0ST	Std.	T. A. Walker at Conchillas **'RUIZ de los LLANOS'** 9.5.11	
1104	1889	0-6-0ST	Std.	T. A. Walker at Conchillas **'PARISH'**	9.5.11
1113	1889	0-6-0ST	Std.	T. A. Walker at Conchillas **'COGHLAN'**	9.5.11
1148	1889	0-6-0ST	Std.	Central Uruguay Railway NER **E7N**, then CUR **43**	9.1.7
1149	1889	0-6-0ST	Std.	Central Uruguay Railway NER **E8N**, then CUR **44**	9.1.7
1197	1890	0-6-0ST	Std.	Central Uruguay Railway **1**[2]	9.1.7
1198	1890	0-6-0ST	Std.	Central Uruguay Railway **2**[2]	9.1.7

Neumeyer

5	1923	0-4-0T	60cm	*Indare SA* **8**	9.5.2

North British Locomotive Co.

16349	1904	2-6-0	Std.	Uruguay Northern Railway **4**	9.1.3

O&K

1755	1906	0-4-0T	60cm	*Indare SA* **2**	9.5.2
1784	1906	0-4-0T	60cm	*Indare SA* **3**	9.5.2
1785	1906	0-4-0T	60cm	*Indare SA* **1**	9.5.2
1923	1906	0-4-0T	60cm	*Indare SA* **4**	9.5.2
2030	1906	0-4-0T	60cm	*Indare SA* **5**	9.5.2
2647	1908	0-6-0T	75cm	*Cantara Burgueño* **?**	9.4.2
2819	1908	0-6-0T	75cm	*FC Piriápolis a Pan de Azucar* **?**	9.3.1
2820	1908	0-6-0T	75cm	*FC Piriápolis a Pan de Azucar* **?**	9.3.1
3725	1910	0-4-0T	75cm	*FC Piriápolis a Pan de Azucar* **?**	9.3.1
3957	1910	0-4-0T	3' 0"	*Nac. Admin. del Pto. de Montevideo* **?**	9.5.1
4036	1910	0-4-0T	3' 0"	*Nac. Admin. del Pto. de Montevideo* **?**	9.5.1
4124	1910	0-4-0T	60cm	*Puerto de la Paloma* **?**, thence to	9.5.8
				Indare SA **22**	9.5.2
4153	1910	0-4-0T	60cm	*Indare SA* **24**	9.5.2
4741	1911	0-6-0T	75cm	*FC Piriápolis a Pan de Azucar* **?**	9.3.1
4922	1911	0-4-0T	60cm	*Indare SA* **6**	9.5.2
4999	1911	0-4-0T	60cm	*Puerto de La Paloma* **?**	9.5.8
5433	1912	0-6-0T	Std.	*Nac. Admin. del Pto. de Montevideo* **1**	9.5.1
5434	1912	0-6-0T	Std.	*Nac. Admin. del Pto. de Montevideo* **2 'La MARICERA'**	9.5.1
5633	1912	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
5831	1912	0-4-0T	60cm	*O&K lager Montevideo*	9.6
5835	1913	0-4-0T	60cm	*Indare SA* **15**	9.5.2
5837	1913	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
5838	1913	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
5999	1913	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
6095	1913	0-4-0T	3' 0"	*Nac. Admin. del Pto. de Montevideo* **?**	9.5.1
6096	1913	0-4-0T	3' 0"	*Nac. Admin. del Pto. de Montevideo* **?**	9.5.1
6698	1913	2-6-0T	75cm	*FC Piriápolis a Pan de Azucar* **'FUERZA'** (or vice-	9.3.1
6699	1913	2-6-0T	75cm	*FC Piriápolis a Pan de Azucar* **'VOLUNTAD'** versa)	9.3.1
10512	1924	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
10513	1924	0-4-0T	60cm	*Dirección de Vialidad* **?**	9.5.4
10514	1924	0-4-0T	60cm	*Dirección de Vialidad* **?**	9.5.4
10515	1924	0-4-0T	60cm	*Dirección de Vialidad* **?**	9.5.4
10766	1923	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**, thence to	9.5.3
				Indare SA **7**	9.5.2
10767	1923	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
10973	1925	0-4-0T	60cm	*O&K lager Montevideo*	9.6
11012	1925	0-4-0T	60cm	Ernesto Quincke, agent, *Montevideo*	9.6
11014	1925	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
11100	1925	0-4-0T	60cm	*O&K lager Montevideo*	9.6
11201	1926	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
11339	1927	0-4-0T	60cm	*O&K lager Montevideo*	9.6
11366	1927	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3

11611	1928	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
11652	1928	0-4-0T	60cm	*Melzen, Vincenti y Cía.* **?**	9.5.3
11869	1924	0-4-0T	60cm	*Dirección de Vialidad* **?**	9.5.4
11870	1924	0-4-0T	60cm	*Dirección de Vialidad* **?**	9.5.4

Porter

2428	1901	2-6-0	90cm	*Medici y Lacaze* for Puerto del Sauce railway **8**	9.3.1
2429	1901	2-6-0	90cm	*Medici y Lacaze* for Puerto del Sauce railway **9**	9.3.1

Rushmore & Co.

?	1921	Railmotor	Std.	*FCyT del Norte de Montevideo* **'?'**	9.1.4
?	1921	Railmotor	Std.	*FCyT del Norte de Montevideo* **'?'**	9.1.4

Ruston Proctor

11793-6	1886	0-4-0ST	90 cm	Lavalle y Medici for Pto. de La Plata works, then to Pto. del Sauce. One of the four locos.	9. 3.1

Salto works

–	1895	2-4-0T	Std.	North Western Uruguay Railway **11**? **CRIOLLO'**	9.1.1

Sharp Stewart

1919	1869	2-4-0	Std.	Central Uruguay Railway **5 'La FLORIDA'** 9.1.7	
3375	1886	4-4-0T	Std.	North Western Uruguay Railway **6 '?'**, then to NER?	9.1.1
3376	1886	4-4-0T	Std.	North Western Uruguay Railway **7 'CUAREIM'**,	9.1.1
				then to NER?	9.1.2
3377	1886	4-4-0T	Std.	North Western Uruguay Railway **8 'YACUE'**,	9.1.1
				then to NER?	9.1.2
3421	1886	4-4-0T	Std.	North Western Uruguay Railway **9 'PROGRESO'**,	9.1.1
				then to NER?	9.1.2
3422	1886	4-4-0T	Std.	North Western Uruguay Railway **10 'ARTIGAS'**,	9.1.1
				then to NER?	9.1.2
3430	1886	2-6-0	Std.	Uruguay Midland Railway **1**	9.1.6
3431	1886	2-6-0	Std.	Uruguay Midland Railway **2**	9.1.6

Robert Stephenson

1081	1857	2-4-0T	Std.	Birkenhead Railway **1 'ZENO'**, then to LNWR **401** later **1145**,	
				then to Central Uruguay Railway **6 'CLAIMANT'**	9.1.7
1082	1857	2-4-0T	Std.	Birkenhead Railway **2 'ZOPYRUS'**, then to LNWR **404** later **1129**,	
				then to Central Uruguay Railway **7 'URUGUAY'**	9.1.7
2701	1891	2-6-0	Std.	Central Uruguay Railway **53**, possibly for use on the EER	9.1.7
2702	1891	2-6-0	Std.	Central Uruguay Railway **54**, possibly for use on the EER	9.1.7
2703	1891	2-6-0	Std.	Central Uruguay Railway **55**, possibly for use on the EER	9.1.7
2704	1891	2-6-0	Std.	Central Uruguay Railway **56**, possibly for use on the EER	9.1.7
2705	1891	4-4-0	Std.	Central Uruguay Railway **47**	9.1.7
2706	1891	4-4-0	Std.	Central Uruguay Railway **48**	9.1.7
2707	1891	4-4-0	Std.	Central Uruguay Railway **49**, originally for use on the EER	9.1.7
2708	1891	4-4-0	Std.	Central Uruguay Railway **50**, originally for use on the EER	9.1.7
2709	1891	4-4-0	Std.	Central Uruguay Railway **51**, originally for use on the EER	9.1.7

2710	1891	4-4-0	Std.	Central Uruguay Railway **52**, originally for use on the EER	9.1.7
2711	1891	0-6-0T	Std.	Central Uruguay Railway **45**	9.1.7
2712	1891	0-6-0T	Std.	Central Uruguay Railway **46**	9.1.7

Taunton

592	1872	4-4-0	Std.	North Eastern Uruguay Railway **'PANDO'**, then to CUR **15**[2]	9.1.2
594	1872	4-4-0	Std.	North Eastern Uruguay Railway **'MINAS'**, then to CUR **16**[2]	9.1.2
628	1872	4-4-0	Std.	North Eastern Uruguay Railway **'MARONAS'**, then to CUR **38**	9.1.2
629	1872	4-4-0	Std.	North Eastern Uruguay Railway **'CLEMENTINA'**, then to CUR **39**	9.1.2
630	1872	4-4-0	Std.	North Eastern Uruguay Railway **'MALDONADO'**, then to CUR **40**	9.1.2
631	1872	4-4-0	Std.	North Eastern Uruguay Railway **'La UNION'**, then to CUR **41**	9.1.2

Vulcan Foundry

673	1873	2-4-0	Std.	Central Uruguay Railway **9 'El DURAZNO'**	9.1.7
674	1873	2-4-0	Std.	Central Uruguay Railway **10 'SANTA LUCIA'**	9.1.7
675	1873	2-4-0	Std.	Central Uruguay Railway **8 'VOY A BRASIL'**	9.1.7
676	1873	2-4-0	Std.	Central Uruguay Railway **12 'REQUENA'**	9.1.7
677	1873	2-4-0	Std.	Central Uruguay Railway **11 'RODRIQUEZ'**	9.1.7
684	1873	2-4-0	Std.	Central Uruguay Railway **14 'RIO NEGRO'**	9.1.7
685	1873	2-4-0	Std.	Central Uruguay Railway **13 'El YI'**	9.1.7
2830	1913	4-4-4T	Std.	Central Uruguay Railway **38**[2]	9.1.7
2831	1913	4-4-4T	Std.	Central Uruguay Railway **39**[2]	9.1.7
2832	1913	4-4-4T	Std.	Central Uruguay Railway **40**[2]	9.1.7
2833	1913	4-4-4T	Std.	Central Uruguay Railway **41**[2]	9.1.7
2834	1913	4-4-4T	Std.	Central Uruguay Railway **42**[2]	9.1.7
2835	1913	4-4-4T	Std.	Central Uruguay Railway **43**[2]	9.1.7
3135	1915	4-4-4T	Std.	Central Uruguay Railway **8**[2]	9.1.7
3136	1915	4-4-4T	Std.	Central Uruguay Railway **9**[2]	9.1.7

Vulcan Iron Works

4099	1930	0-4-0T	3' 0"	Uruguayan Portland Cement Co. **4**	9.1.10

Unknown
