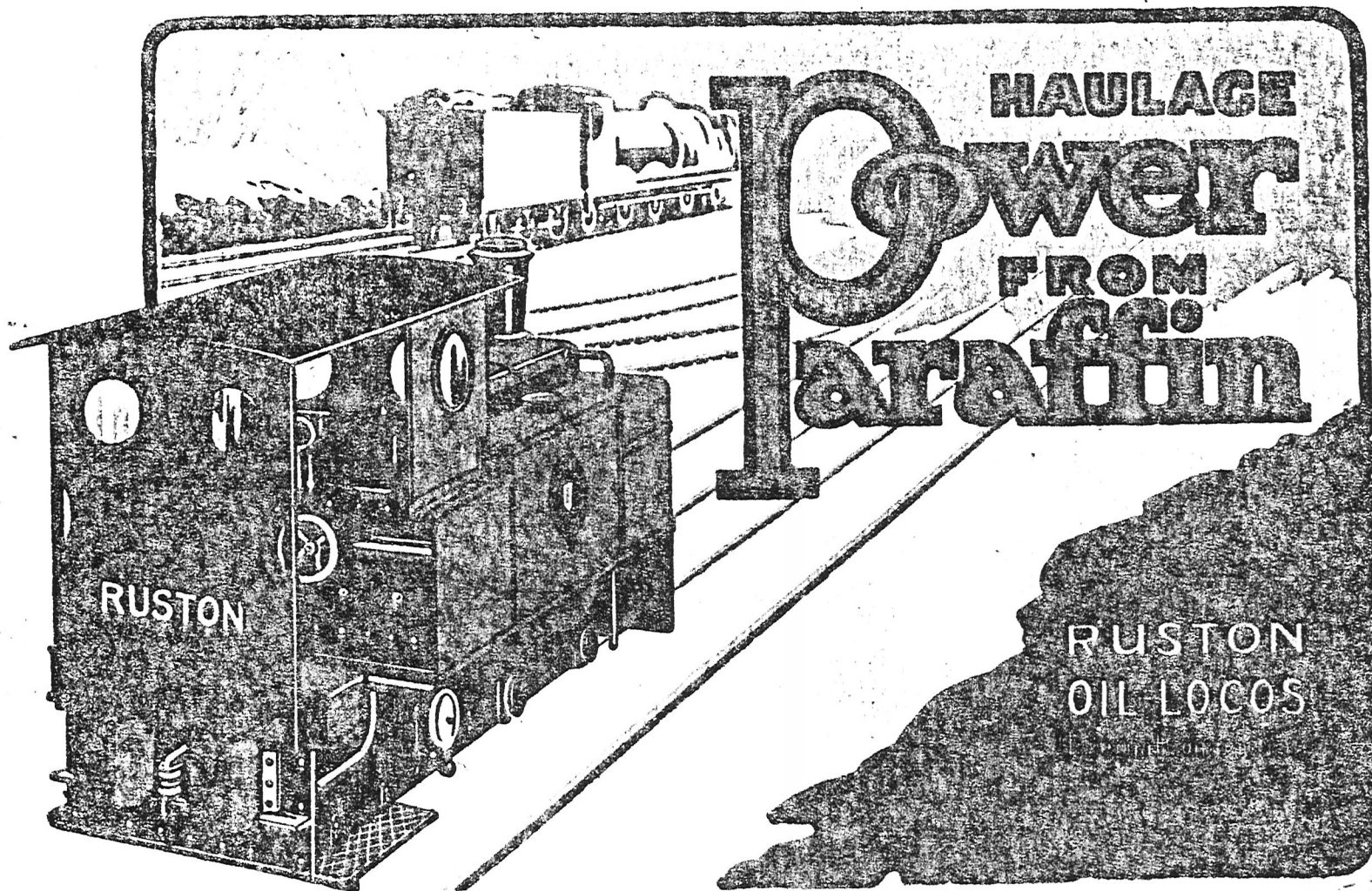


# On Her Majesty's Service

WASC 1750





RUSTON

HAULAGE  
**Power**  
FROM  
**Taraffin**

RUSTON  
OIL LOCOS



# The RUSTON Oil Loco

TO WORK WITH

LIQUID FUEL, SUCH AS PETROL, HEAVY GASOLENE,  
BENZOL, CRUDE BENZOL, PARAFFIN AND ALCOHOL

IN

Mines, Quarries, Brickyards, and Forests ; Tea, Coffee, Sugar, Cotton,  
Rubber, Banana, and other Plantations ; Power Stations, Paper  
Mills, Cable Works, Breweries, Powder-Factories, etc.,  
and for Light Railways and Tramways.

*Sole Makers*

TELEGRAMS  
"RUSTON, LINCOLN"

**RUSTON & HORNSBY LIMITED** LINCOLN  
ENGLAND

TELEPHONE  
580 LINCOLN

And at GRANTHAM AND STOCKPORT



# Foreword

In 1914, when we placed on the market the first of our Internal Combustion Oil Locos, a wide-spread interest was immediately apparent, and that that interest has been maintained is proved by the fact that we have already exhausted two large editions of Booklet No. 3637, which described in detail the Loco's many uses, merits and advantages.

In this, the third edition, we have not only embodied all the information contained in the first two, but with the wider knowledge and experience gained in the numberless practical tests made during the past five years, have been able largely to amplify the same.

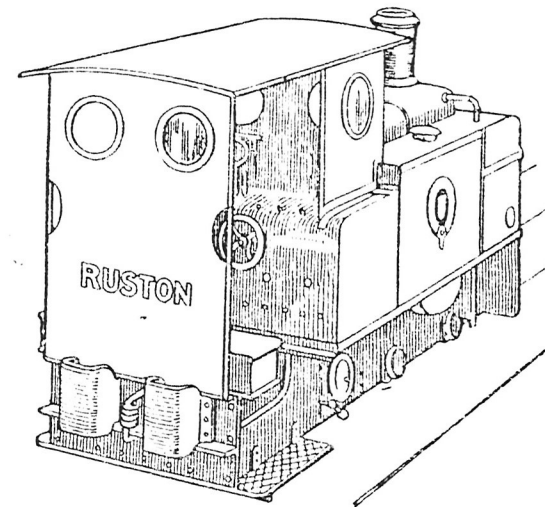
The illustrations and particulars given, and especially such evidence as is contained in the letter reproduced on page 15, will, we believe, encourage many concerns to install the "Ruston" Oil Loco in the interests of economy.

From such we cordially invite enquiry, and request them to address communications to

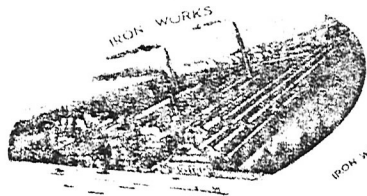
Oil Loco (Internal Combustion) Department,

**Ruston & Hornsby Limited**

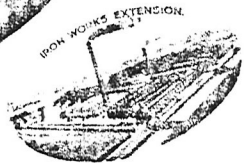
*Head Office: LINCOLN*







IRON WORKS



IRON WORKS EXTENSION

LINCOLN

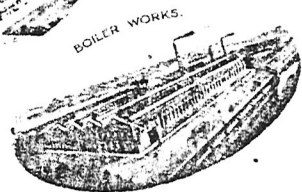


WOOD WORKS



WELD WORKS EXTENSION

WORKS



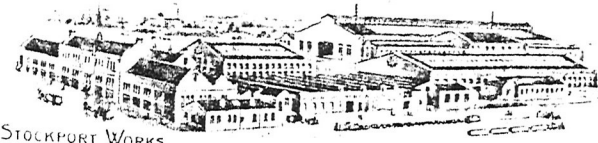
BOILER WORKS



GRANTHAM WORKS

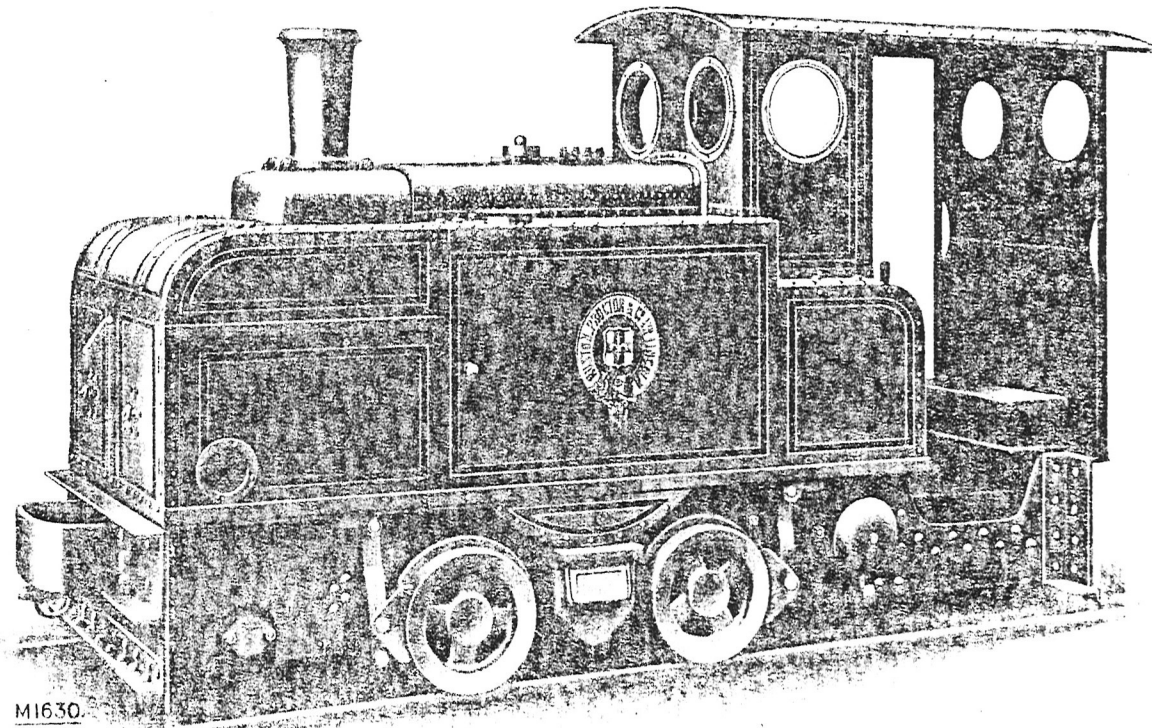
THE SEVEN WORKS OF  
**RUSTON & HORNSBY LIMITED**  
ENGINEERS  
LINCOLN, GRANTHAM & STOCKPORT  
ENGLAND

*Cover 180 Acres and employ 10,000 Workpeople*



STOCKPORT WORKS





M1630.

18

10 B.H.P. RUSTON OIL LOCO (INTERNAL COMBUSTION)



# *The Backing of Experience*

THE utility of the "Ruston" Oil Loco is as wide as its reputation. The contents of the following pages should convince potential buyers the world over of its merit and the wisdom of installing it.

Behind the "Ruston" Loco is experience. It represents the ultimate result of many years of experimenting, supported by sound workmanship, founded on the financial backing, organization, and reputation of the makers.

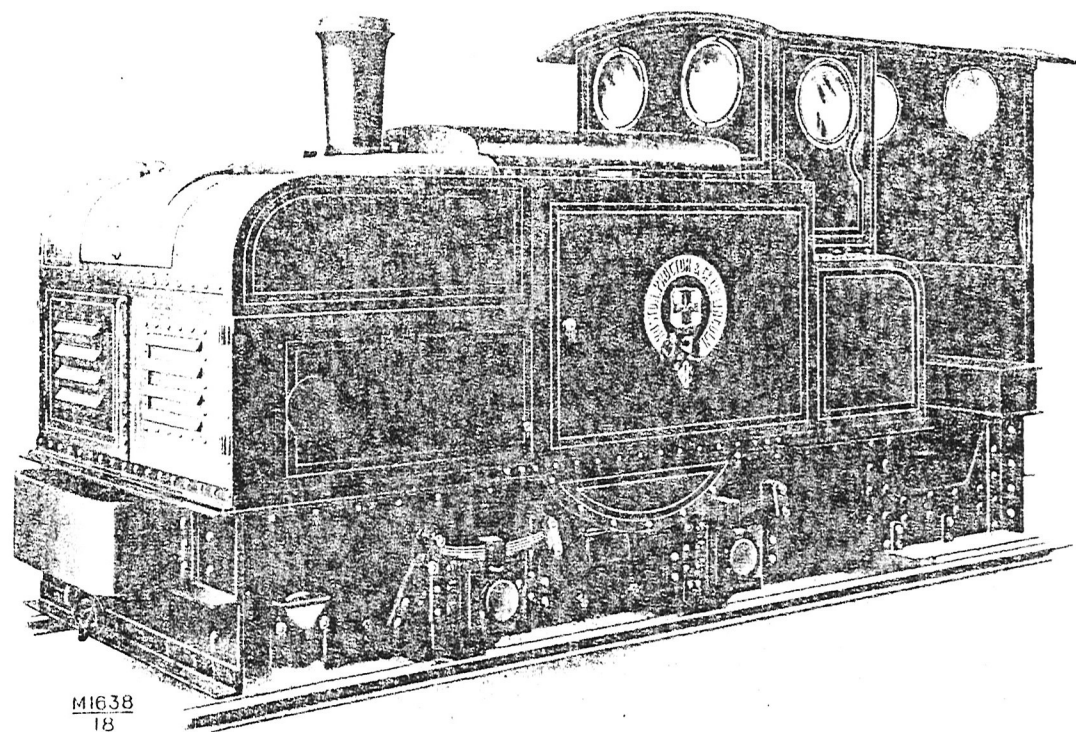
Here are a few facts about ourselves:—

The firm of Ruston & Hornsby Ltd. is the amalgamation (1918) of two of the oldest and most widely-known engineering firms in the world.

Ruston, Proctor & Co., founded 1840, are makers of Industrial Prime Movers, and have branches and agencies in practically every country in the world.

Richard Hornsby & Sons Ltd., founded in 1815, are also known all over the world as pioneers and the largest makers of Oil Engines in the world; they also combine the experience of the makers of the "Stockport" Gas Engines, pioneers and makers of Gas Engines since 1878.

Ruston & Hornsby Ltd., the amalgamated firm, combine, therefore, a joint experience of over a century with special skill and experience in Internal Combustion Engines, and hold the world's highest awards, including gold and silver medals and first prizes.



20 B.H.P. RUSTON OIL LOCO (INTERNAL COMBUSTION)



# *The RUSTON Oil Loco*

THE advance in the use and application of the Internal Combustion Engine, particularly in the last five years, has been marked.

As an example of the application of the Internal Combustion Engine the "Ruston" Oil Loco for working on paraffin stands out prominently, and its ability to perform efficiently and economically the duties for which it is built, have brought it into permanent favour, even in countries where coal is the basis fuel.

In directing attention to the possibilities of this engine, one finds few large fields in the industrial world where its introduction would not make for speed and economy. In this connection one might mention powder factories, mines, quarries, brickyards, and forests; tea, coffee, sugar, cotton, rubber, banana, and other plantations; power stations, paper mills, cable works, breweries, factories, etc., and light railways and tramways.

It is hardly necessary to lay stress on its advantages to any of the foregoing enterprises. The fact that it can start from cold at a moment's notice, and entails no stand-by losses, will commend it to certain classes of industry, such as quarries, brickyards, and factories; and as by its adoption the inconvenience of having to transport large quantities of fuel and water for its use will be eliminated, managers of timber concessions and portable railways which are mostly established in remote regions and have long experienced this bugbear of coal-fuelled transport service, will keenly welcome it.

The fact that the "Ruston" Loco is absolutely safe as regards sparks has already attracted widespread notice, and particularly in timber concessions, powder factories, and mines, as by its use there is no fear of

## THE RUSTON OIL LOCO—*continued.*

sparks setting fire to trees, or inflammable gases and material, which has been too often the case where externally-fired locomotives have been used.

That the British Government is now running four in one powder factory, and five in another, is in itself sufficient assurance, not only of their absolute safety in this respect, but also as regards freedom from break-down, and all-round adaptability.

To every class of buyer, the fact that the "Ruston" Loco needs no skilled labour, and that any man or girl of average intelligence can run it with ease and safety, should point a way to getting the better of the ever-recurring transport and labour trouble, especially as one person only—man, boy, or girl—is required to run it, thus doing away with the services of the second man acting as stoker in coal-fired locos.

The fundamental features of the "Ruston" Oil Loco are its solidity of construction and the employment of a slow-speed horizontal engine with high flywheel effects, the exact opposite of that of the oil locomotive which has developed out of the motor-car, and in which high speeds, small surfaces, and low flywheel effects are employed, with all their resultant ill effects and rapid depreciation.

A description of the construction features of the "Ruston" Oil Loco suitably divides itself into three parts:— (1) The Frame and Housing. (2) The Engine. (3) The Gearing.

(1) **The Frame and Housing.**—Heavy loco-pattern frame built up of steel plates stiffened by angle irons, and supported by powerful leaf and coil springs over the axle-boxes. These latter have gun-metal bearings and are housed in malleable iron shells which are flanged and slide in accurately machined



## THE RUSTON OIL LOCO *-continued.*

horn blocks. The four wheels have malleable iron centres and shrunk on steel tyres. A powerful hand-controlled brake, operating on all four wheels, is fitted.

To protect the engine and gears against dust and weather, they are enclosed in a substantial housing fitted with large and easily removed doors, permitting all important parts to be inspected. The coupling and buffer gear is designed, as far as possible, to fit the existing rolling stock. A sand box, controlled by a foot lever in the cab, is fitted over each rail, and a signal gong is also provided. The driver's cab gives adequate covering for driver, lubrication and control gear.

Illustration 1, page 18, shows plate-work in the frame, the thickness of the plates, the stiffness of the angle irons, and the general solidity. In the same illustration is shown the exhaust and sand boxes firmly secured in position, whilst one of the axle-boxes is shown removed. The illustration, page 20, shows the axle-boxes, caps and springs in position, the strong top plate, and the shock-resisting channel backing up the buffers.

It will be seen that the frame and housing are designed upon correct locomotive lines, and possess great stiffness. This latter feature has been found to be absolutely essential to withstand the severe shocks experienced in marshalling trucks, in derailments that may ensue through spreading of the gauge or the derangement of the crossings and points, or from the general wear and tear of the track, all of which cannot be withstood by the lightly built type.

THI

THE RUSTON OIL LOCO—*continued.*

7

(2) **The Engine.**—An Oil Engine of simple design, fitted with patent device whereby such different fuels as Petrol, Heavy Gasolene, Benzol, Crude Benzol and Paraffin may be used.

This Engine is thoroughly reliable and is fully tested on the brake before being placed on the Loco. The fuel consumption, when running on Paraffin, is 65 lb. per B.H.P./hour. The Engine is very powerful and flexible, especially arranged for handling varying loads. It is carefully balanced, and can be started up from cold without delay, enabling the Locomotive to be put into service at once.

It is of the heavy low-speed type, which has proved itself to be more reliable than the light high-speed automobile type, owing to its ability to withstand the severe wear and tear inseparable from the class of work for which these Locomotives are designed.

The bedplate is of a massive box-pattern construction, one piece bored and faced simultaneously (by special machine) to receive cylinder and crank bearings, thus assuring perfect alignment.

The cylinder and liner form a separate casting, securely bolted to the bedplate, of special close-grained cast iron, the bore for piston accurately finished with a special machine.

The Engine is fitted with a powerful governor, very sensitive, and adjustable for varying speeds while the Engine is running. This governor, which is fitted with a dash-pot to prevent "hunting," also controls the lift of the exhaust valve and so regulates the heat of the Engine, thereby showing a marked superiority over other systems of governing, especially for light loads when using paraffin.



## THE RUSTON OIL LOCO *--continued.*

The crankshaft is unusually strong, crank machined from the solid steel forging and accurately finished and balanced to reduce vibration to a minimum. It carries two specially heavy flywheels with face and edges machined. The piston is made from close-grained cast iron, ground to fit accurately the cylinders, and fitted with rings.

The gear wheels have machine-cut teeth, cut from solid blanks of special metal (ensuring silent running) and provided with adequate means of lubrication.

The bearings are specially designed to give extra large wearing surfaces and so prevent the need for frequent adjustment.

The lubrication, which is so essential to the smooth running and long life of the Engine, has received fullest consideration, and ample provision has been made for the complete lubrication of every wearing part.

No lamp is required for starting; when the Engine is cold, petrol is used for a few minutes, for which purpose a small tank is provided.

For paraffin fuel a vaporiser of simple design is fitted, and for petrol an efficient carburettor.

The magneto is of the high-tension type, with sparking plugs and variable trip gear for retarding the spark at starting.

The cylinders are water cooled, and for this purpose a cast-iron water tank is carried over the cylinder, thus dispensing with a circulating pump. This design, eliminating all working parts, is admirably

THE RUSTON OIL LOCO—*continued.*

fitted to withstand the extremely rough usage these Engines are called upon to bear. It is not subject to the leakage of the ordinary motor-car type of cooler or radiator.

In illustration, page 20, the Engine will be seen firmly bolted down to the massive loco-pattern underframe already described.

(3) **The Gearing.** The Loco. is fitted with an ingenious and compact form of gearing, giving two travelling speeds, forward and reverse, of 3 and 6 miles per hour.

The engine power is transmitted by means of machine-cut steel spur wheels through two clutch shafts, from which the drive is carried to the rear axle by means of a heavy double-roller chain working in an oil bath. A second endless chain couples the rear and front axles, thus transmitting the power to all rail wheels.

Illustration 2, page 18, shows every detail of the gearing in position, including clutches. The speed changes are effected by means of the coil friction clutches operated by a hand wheel in front of the driver, the reverse action being obtained by substantial claw clutches, illustrated by the side of the reversing wheels.

The efficient lubrication of all moving parts is regulated by sight-feed lubricators in the driver's cab.

The arrangement of the gears gives the driver complete control of the Engine, and makes the changing of the speed and the direction of the Loco a simple and rapid operation.

THE RUSTON OIL LOCO—*continued.*

## SIZES, WEIGHTS, AND OTHER PARTICULARS.

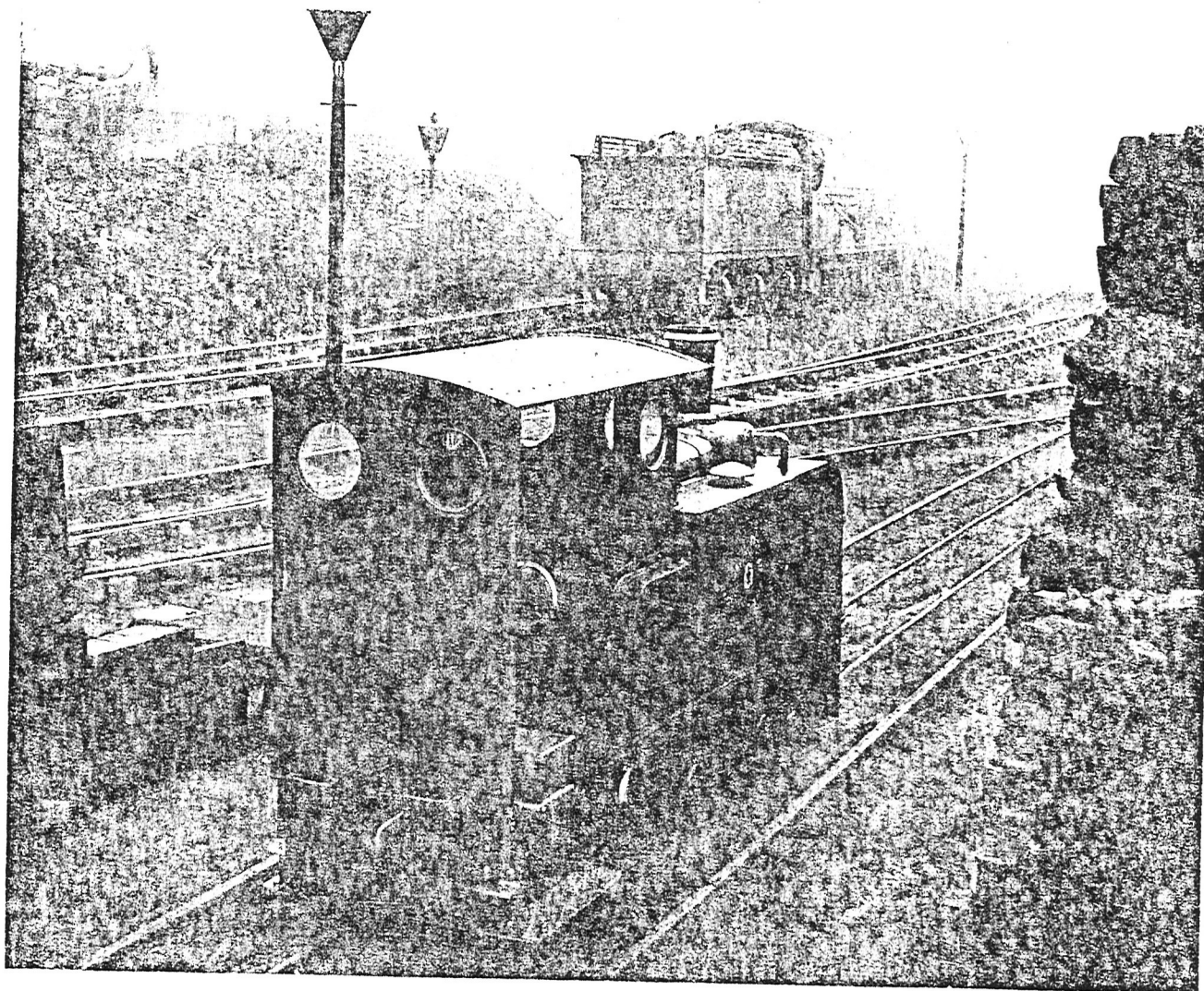
The "Ruston" Oil Loco is built to suit tracks from 16" gauge up, and will comfortably take curves of not less than 30 feet radius.

It is built in two sizes. The drawbar pull, loads hauled, overall dimensions and weight are given in the following table:—

B.H.P. OF LOCO.	NUMBER OF CYLIN- DERS.	DRAWBAR PULL AT 3 MILES PER HOUR.	GROSS LOAD HAULED. TONS.*					OVERALL DIMENSIONS.			NET WEIGHT. TONS.	
			ON LEVEL.	ON GRADIENTS OF				HEIGHT OVER CAB.	LENGTH.	WIDTH.		
				1 IN 200	1 IN 100	1 IN 75	1 IN 50					1 IN 25
10	1	800 lbs.	36	19	13	11	8	3	6' 0"	11' 6"	3' 6"	4½
20	2	1,600 lbs.	72	42	30	24	18	8	6' 0"	12' 0"	4' 3"	5½

\* These figures of gross load hauled on the level, and on gradients, are based on the assumption that the track and rolling stock are in good working condition and that the track is straight.

The following accessories are supplied with each Loco: 1 set of springs, 1 set of spanners, 1 valve grinder, 1 lb. waste, 2 oil cans, 2 starting handles, fuel tank and piping, set of piston rings.



RUSTON 10 H.P. OIL LOCO RUNNING BETWEEN STANDARD GAUGE ON A 16 IN. TRACK



## WORKING COSTS OF THE RUSTON OIL LOCO.

The Engineer of a Government controlled Factory informs us that the working costs of their 10 H.P. Ruston Oil Loco during the months of September to November, 1918, i.e., for 13 weeks of 43 hours, amounted to :-

	<i>£</i>	<i>s.</i>	<i>d.</i>
Fuel Oil - - - - 232 gallons at 1/9½ per gallon - - - -	20	15	8
Petrol - - - - 16 " " 3/1 " " - - - -	2	9	4
Lubricating Oil - - 22 " " 1/9¼ " " - - - -	1	19	10½
Cost of overhauling and repair - - - - - - - - - -	2	0	0
	£27 4 10½		

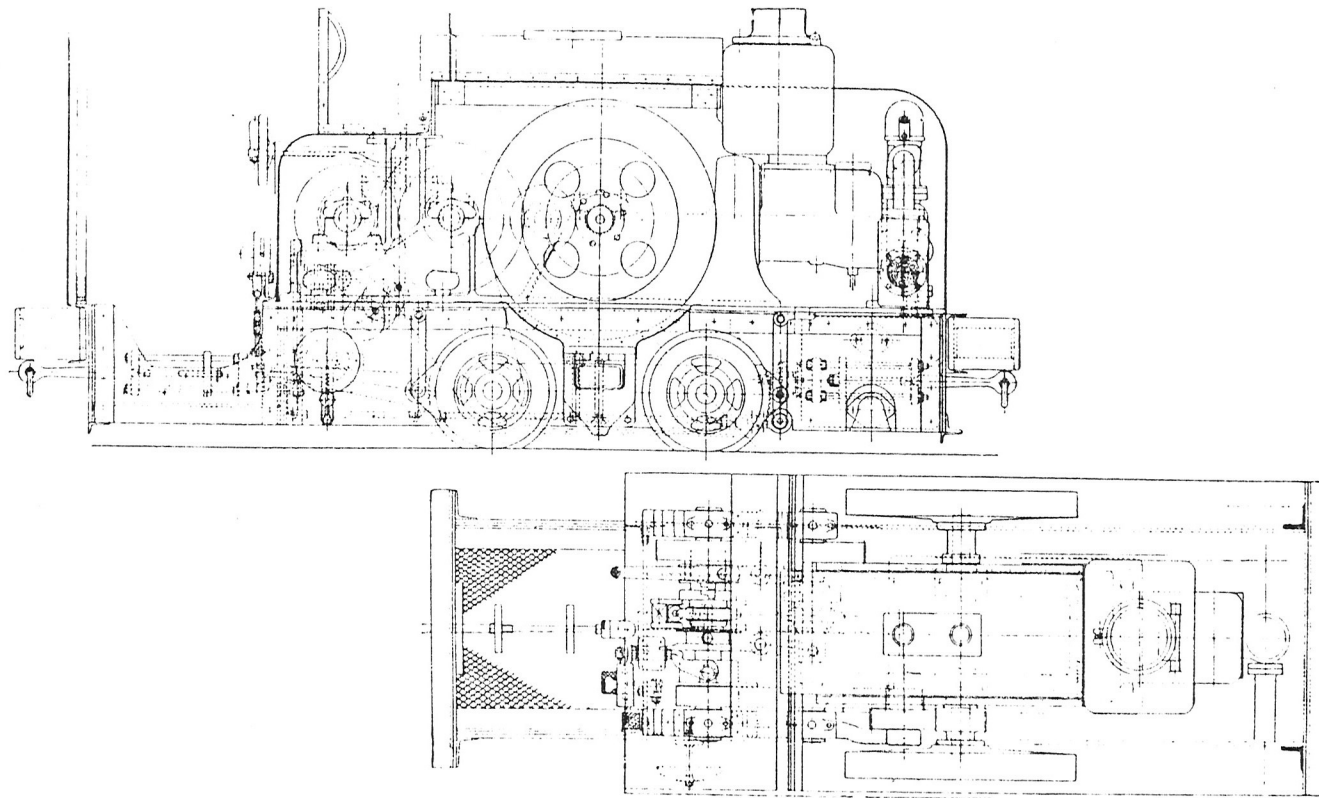
Wages for driver: 32/- plus 28/6 war bonus per week of 48 hours.

" " boy: - 12/- " 10/3 " " " "

The Engineer further writes:—

“The sum of £2 shown for overhauling and repair is the total expenditure for repairs for the whole period that the locomotive has been in use (9 months); its condition is very good, and no further expenditure is anticipated in the near future. Repair parts have not been required.”

As regards the loads hauled, no particulars are given, except that the Loco is continually at work hauling anything from acid retorts to baskets of laundry.



GENERAL ARRANGEMENT OF RUSTON 10 H.P. OIL LOCO

## *“Engineering” describes a RUSTON Oil Loco in a Government Powder Factory*

*Reprinted, by permission,  
from Nov. 30th, 1917,  
issue of “Engineering.”*

THAT the British Government is now running four “Ruston” Oil Locomotives in one factory is in itself sufficient assurance, not only of their absolute safety, but also as regards freedom from breakdown, and all-round adaptability.

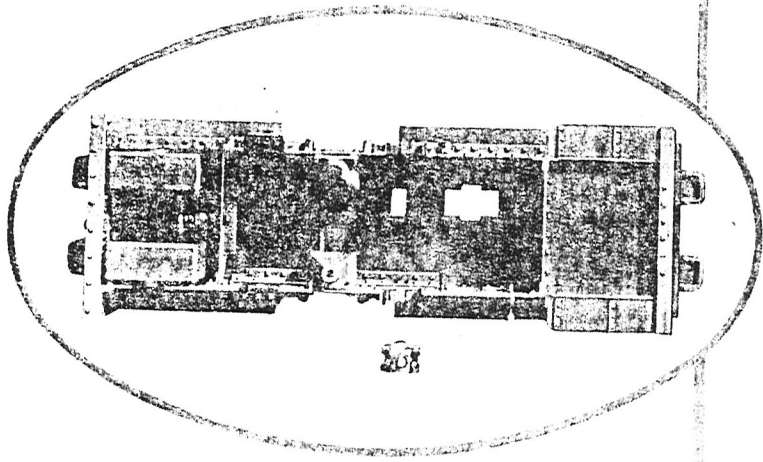
In the Government powder factory referred to there is a railway system  $1\frac{1}{2}$  miles in extent, equipped with four “Ruston” Oil Locomotives, burning paraffin. Part of the track is old, and over it hand trucks were formerly pushed. It was the existence of this track which settled the question of gauge. It was necessary, in order to connect up two parts of the old track, to cross a river twice on swing bridges, while between the bridges a watertight concrete-lined cutting, and a tunnel under a main road, had to be made. The cutting and tunnel are close against and parallel to the river, the normal water-level of which is 3 feet above rail-level at the lowest point.

The worst obstacle in this construction was the removal and re-laying of the town sewer, which syphoned under the river and rose to the surface in a “swan-neck” across the line of the railway. To make matters worse, the nearest joint in the pipes was near the middle of the river, and the

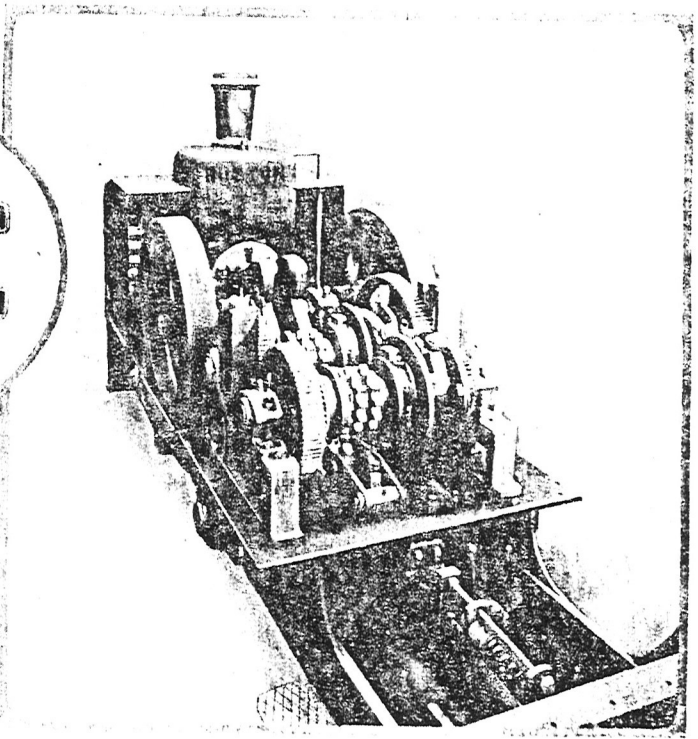
constant stream of navigation could not be stopped. Sufficient room, however, could just be given for one barge to pass outside the coffer dam.

The approaches to the tunnel are on a gradient of 1 in 60, this being the worst that the train has to tackle. At one end the track leaves the river in an S-curve of 60 feet radius, in order to get at a good approach to a swing-bridge. The gradient is reduced to 1 in 100 at this place in order to compensate for the curve. The pier in the river is simply a concrete block, on three 12 inch by 12 inch reinforced concrete piles. The swing span is provided with a hand lever at the shore end, which not only locks the bridge, but at the same time puts down the signal on the fixed span to safety. Similarly, the operation of unlocking the bridge throws the signal to danger, and it is impossible to unlock it without operating the signal.

The minimum radius of curve on the old track is 25 feet, but on the new track there is nothing worse than 30 feet radius. The 25-foot curves are gradually being eliminated, as they are rather too sharp for the engine, which, however, makes little difficulty with the 30-foot radius. The weight of rail used hitherto has been 20 lbs. per yard on steel-pressed sleepers, but this has rather been chosen because so much of it already existed. For the extensions now in progress a 30-lb. rail on wooden sleepers is being used.



No. 1



No. 2

RUSTON 10 H.P. OIL LOCO--FRAME AND GEARING.



## "ENGINEERING" DESCRIBES A RUSTON OIL LOCO IN A GOVERNMENT POWDER FACTORY—*continued*

As regards the rolling stock, the trucks are 12 feet long, and are on bogey-wheel frames. The engine is capable of hauling nine loaded trucks, weighing two tons each, fully loaded over the whole course of the track. For regular working, however, the load has been limited to six trucks.

The construction of the "Ruston" Locomotive, and its general appearance, will be appreciated from an examination of the illustrations on this and the opposite page. In Fig. 1 (pages 4 or 6) is a general outside view of the engine, Fig. 2 (page 16), an elevation with the covers removed to show the mechanism. Fig. 3 (page 16), a plan, similarly exposed. Figs. 4 and 5 (Nos. 2 and 3 on pages 18 and 20) show an engine in course of erection in the builders' works. Fig. 6 (No. 1, page 18) shows the frame laid on its side; while Fig. 7 (page 22) is a view of the locomotive and train in the Government works, together with the female driver, whose figure supplies a scale to show the height of the engine.

In designing this locomotive the builders, Messrs. Ruston, Proctor & Co., Ltd., of Lincoln,\* decided that the somewhat heavy, horizontal, slow-speed engine was far more likely

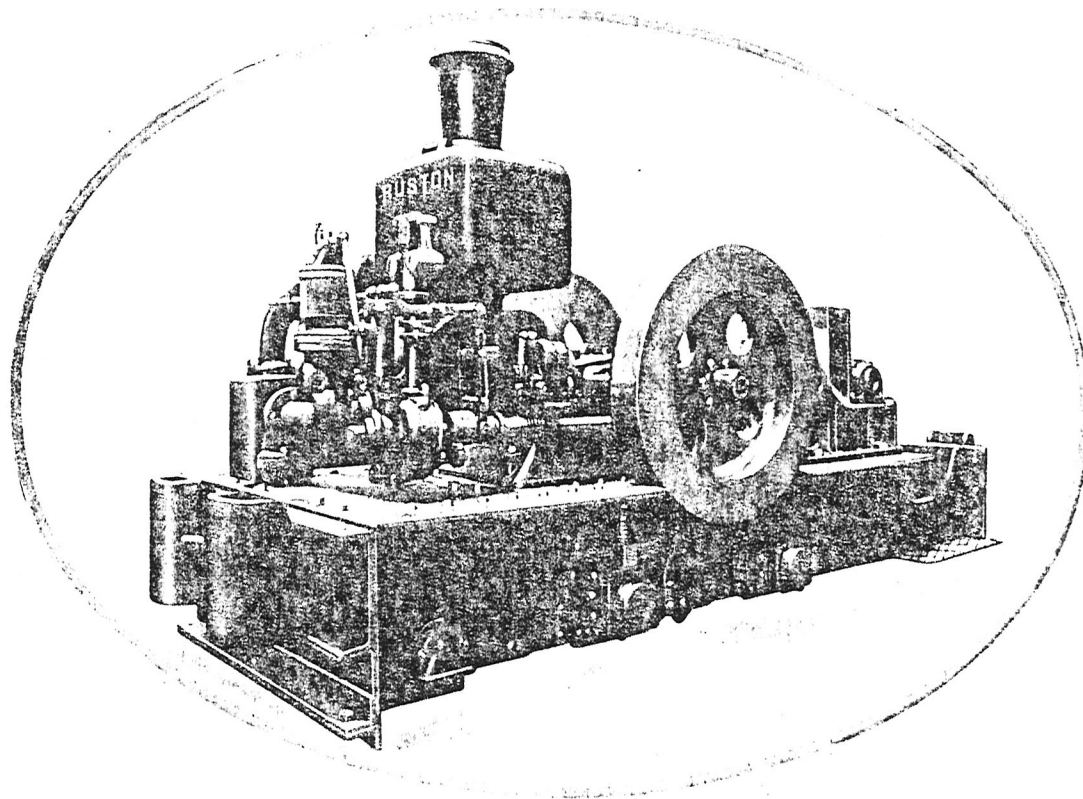
to meet the demands of the case than the lightly-built, vertical, high-speed, easily-racked motor-car type of engine. It was realised that for continuous running and certainty of action the engine must be water-cooled—a decision arrived at by the careful consideration of the causes leading to the breakdown of many locomotives with air-cooled engines.

The locomotive was therefore designed to be compact, low on the ground, and very rigid, with a heavily-built real locomotive framework, giving the great stiffness absolutely necessary to prevent racking, should the gauge spread, or the crossings or points get out of order.

It will be seen from the engravings that the locomotive is built with the weight and rigidity which are essential for the rough treatment which attends all railway work. Figs. 4 and 5 show this, while Fig. 6 reveals the solid construction of the frame. The levers are all arranged in the cab, and are so interlocked that it is impossible to damage the gear. The sliding pinions which need so much skill in motor cars are absent, and the machine makes no more demands on the intelligence of the driver than does an ordinary stationary oil engine.

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\* Since amalgamated with Richard Hornsby & Sons Limited, Grantham & Stockport.



No. 3

RUSTON OIL LOCO ENGINE.

# The "How and Why" of Success

THE FOLLOWING WILL EXPLAIN THE "HOW AND WHY" OF THE ENGINE'S SUCCESS :—

## REASONS FOR SUCCESS.

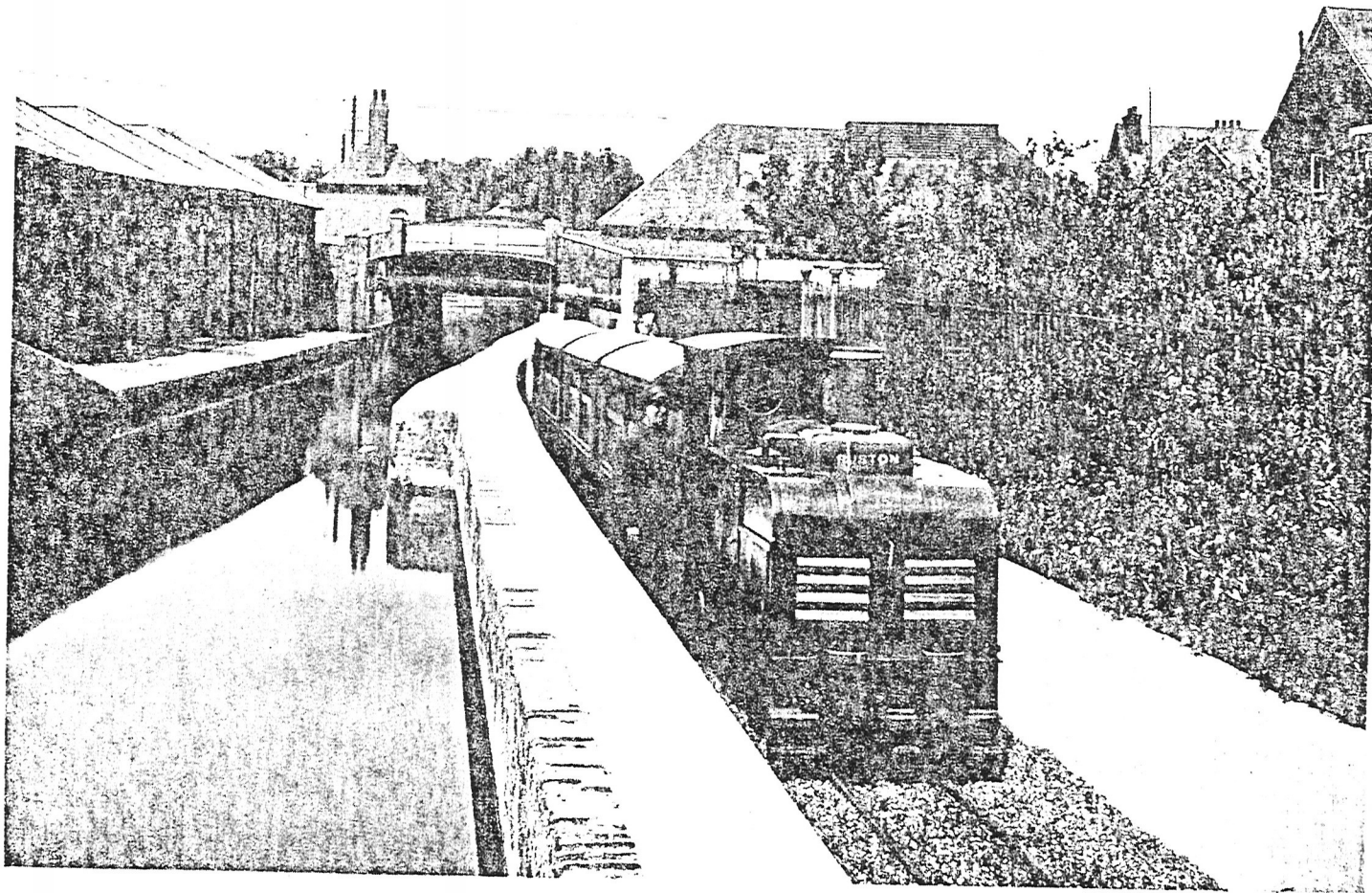
1. The heavy, horizontal, slow-speed engine has proved itself better able to withstand the heavy duty inevitable for this class of work than the vertical, high-speed, easily racked motor-car type.
2. The simplicity and stout design of the engine dispenses with the necessity for skilled labour, and the loco can therefore be safely handled by a man or woman of average intelligence.
3. For continuous running and certainty of action the engine is water-cooled, and in this respect the "Ruston" engine shows a marked improvement over locos fitted with air-cooled engines.
4. The slow-speed engine fitted with two heavy flywheels has flexibility, and can pick up its load without hesitating.
5. The whole loco is compact and very rigid. The solidly-constructed engine is bedded down to the heavily-built loco plate frame. The great stiffness thus obtained absolutely prevents "racking" due to the spreading of the gauge, or the crossing of points, and as the result of derailment.
6. For protection against dust and weather the engine and driving gear is enclosed in a strong iron casing with tightly fitting yet removable doors, giving complete access to all working parts.
7. The Engine is built to run backward and forward at will, and with two speeds either way.

*The embodiment of these features in the "Ruston" Oil Loco gives an Engine which possesses*

*CONTROLLABILITY*

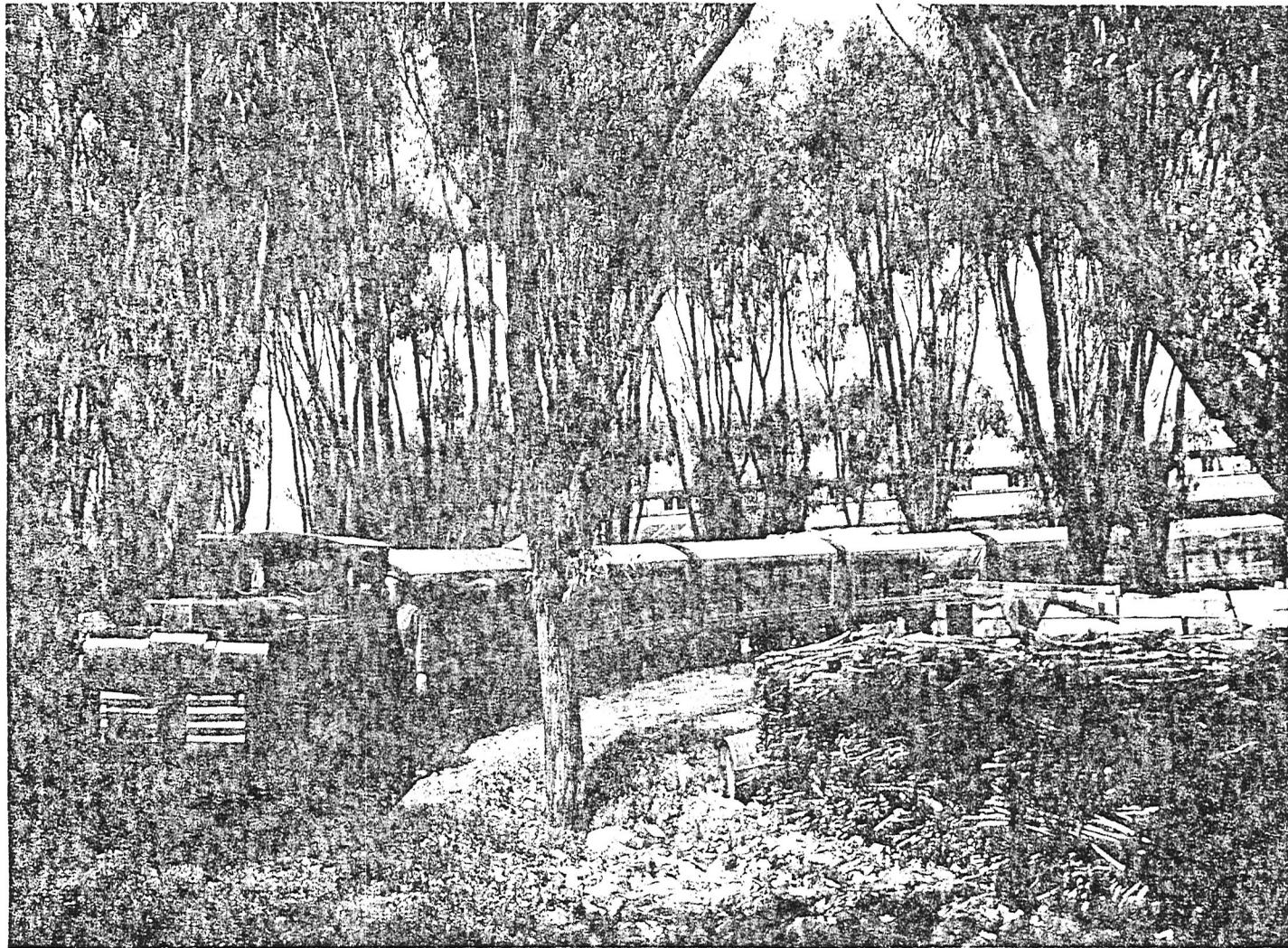
*ADAPTABILITY*

*ECONOMY*

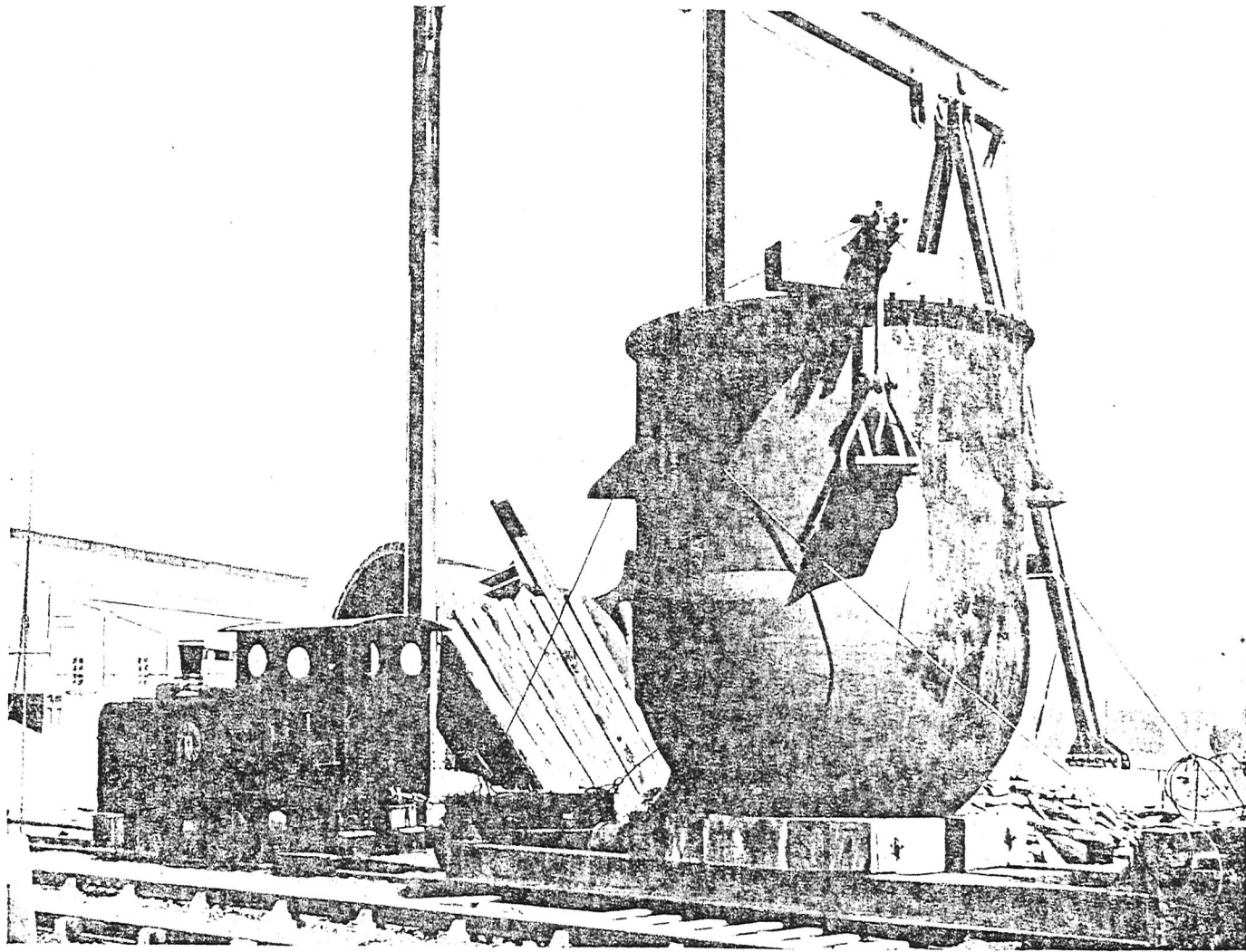


RUSTON 10 H.P. OIL LOCO AT WORK IN A CORDITE FACTORY. 2' 0" GAUGE



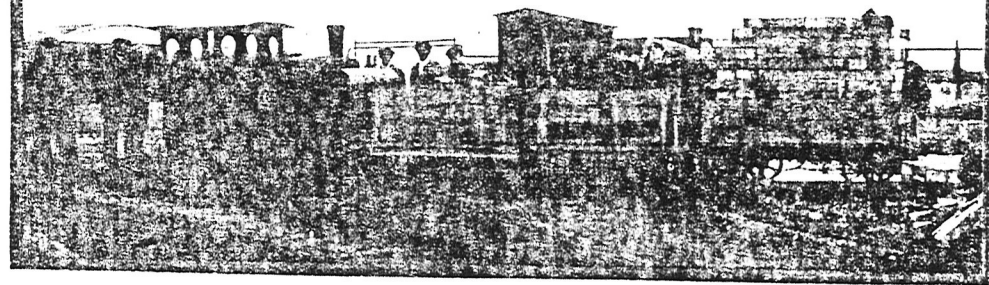
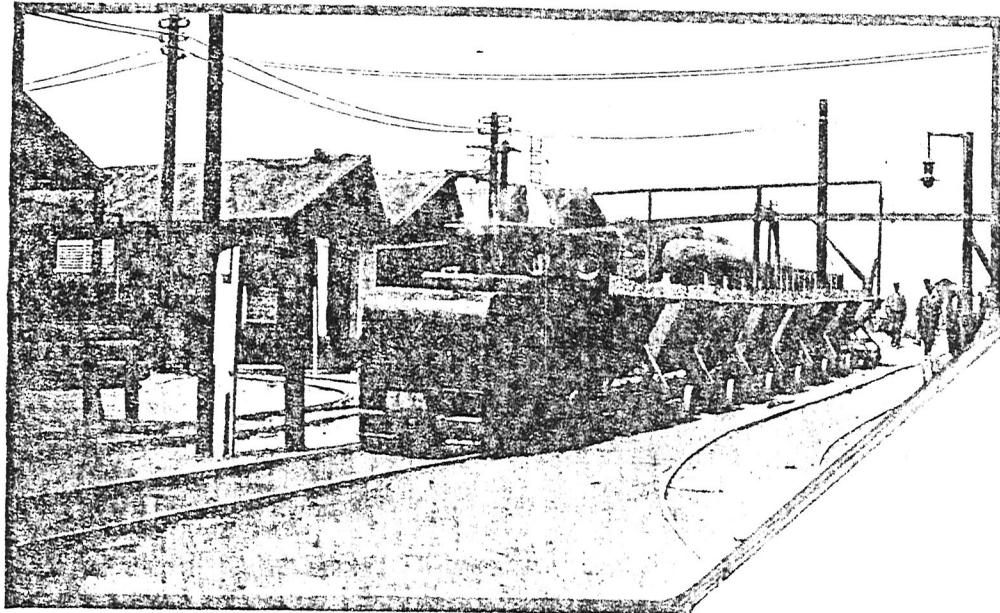


RUSTON 10 H.P. OIL LOCO. 2' 0" GAUGE

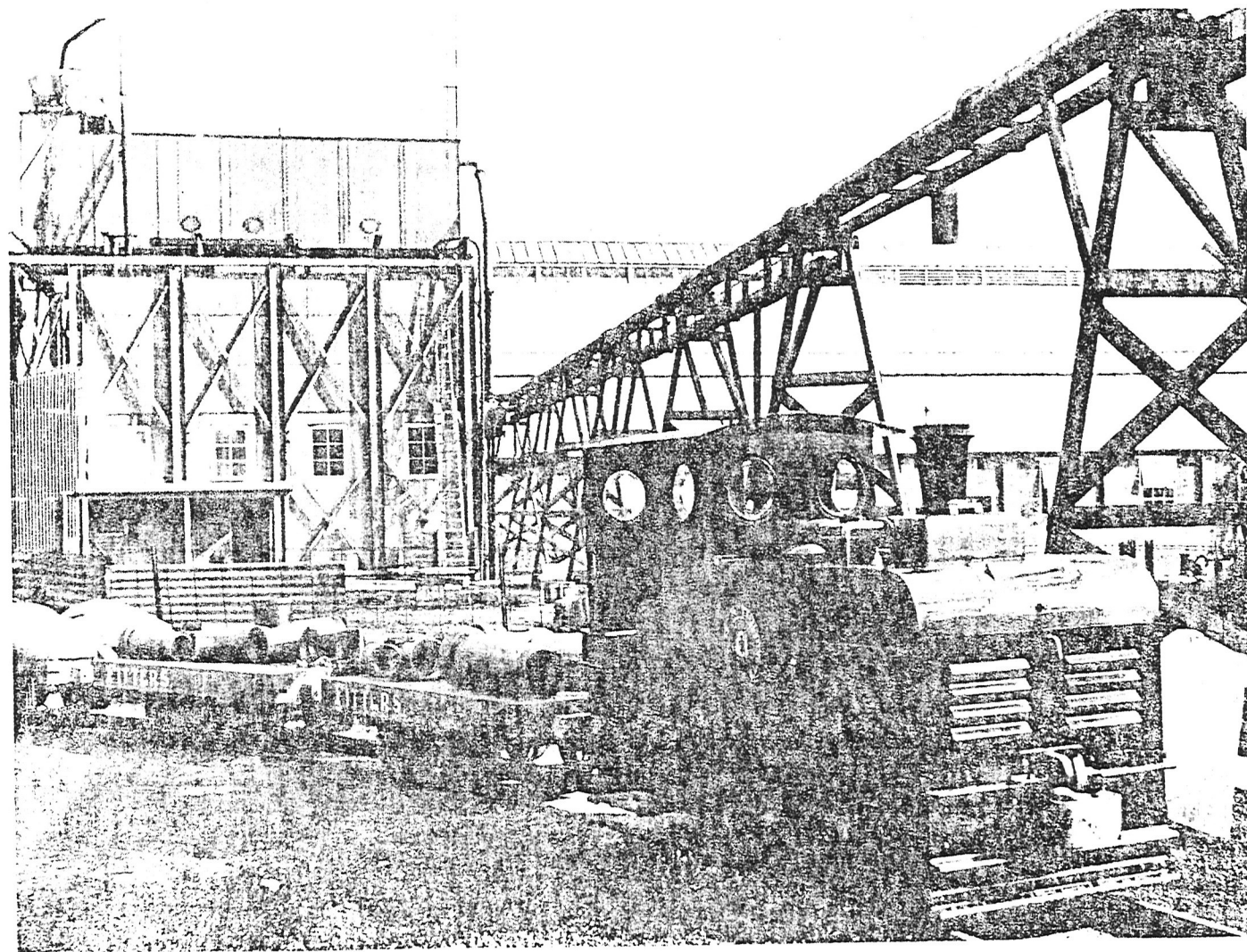


RUSTON 10 H.P. OIL LOCO AT WORK IN EXPLOSIVES FACTORY. 2' 6" GAUGE

RUSTON 10 H.P. OIL LOCO HAULING COAL. 3' 3" GAUGE

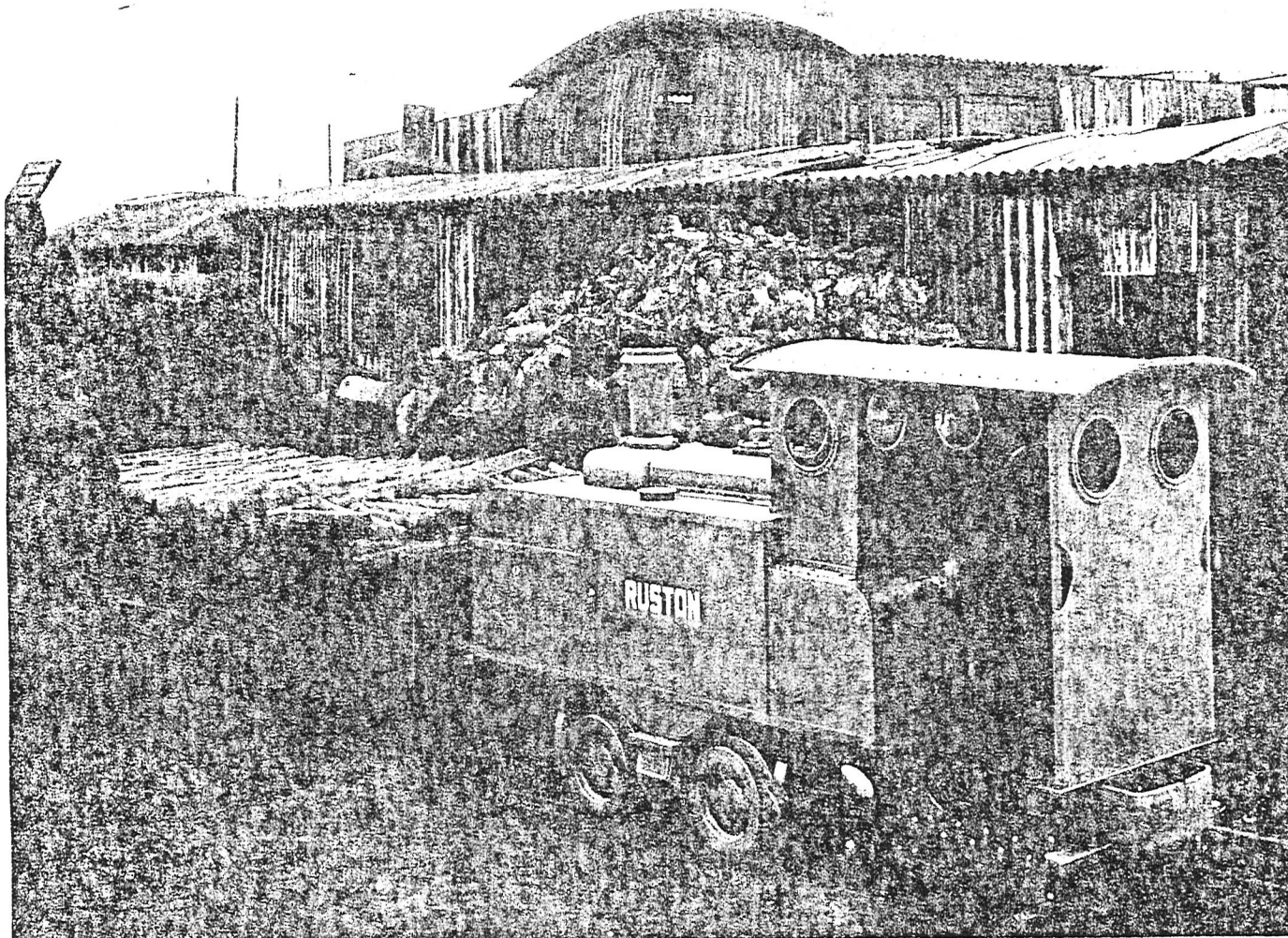


RUSTON 10 H.P. OIL LOCO ON GENERAL HAULAGE. 3' 3" GAUGE

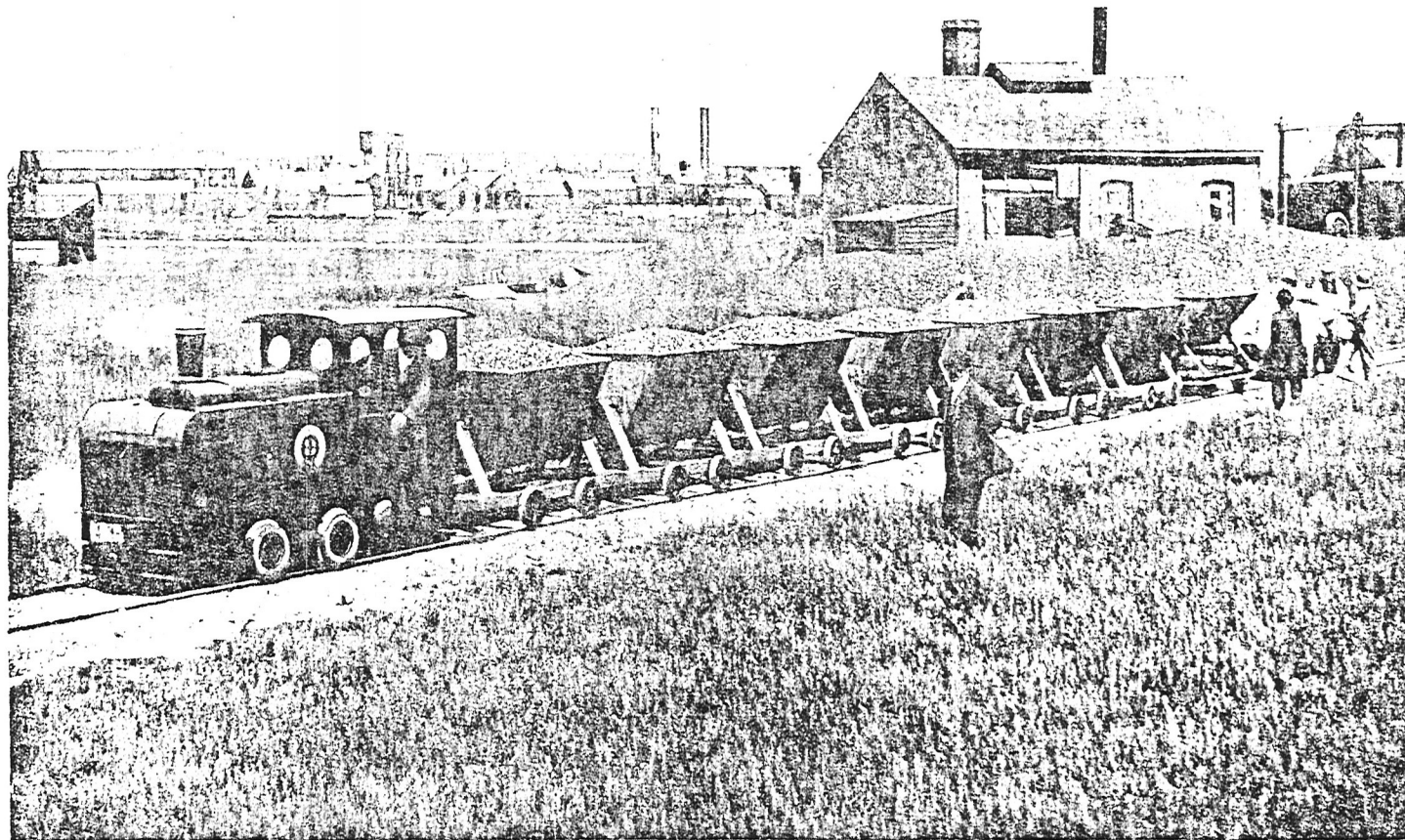


RUSTON 10 H.P. OIL LOCO FOR CONTRACTOR. 2' 6" GAUGE



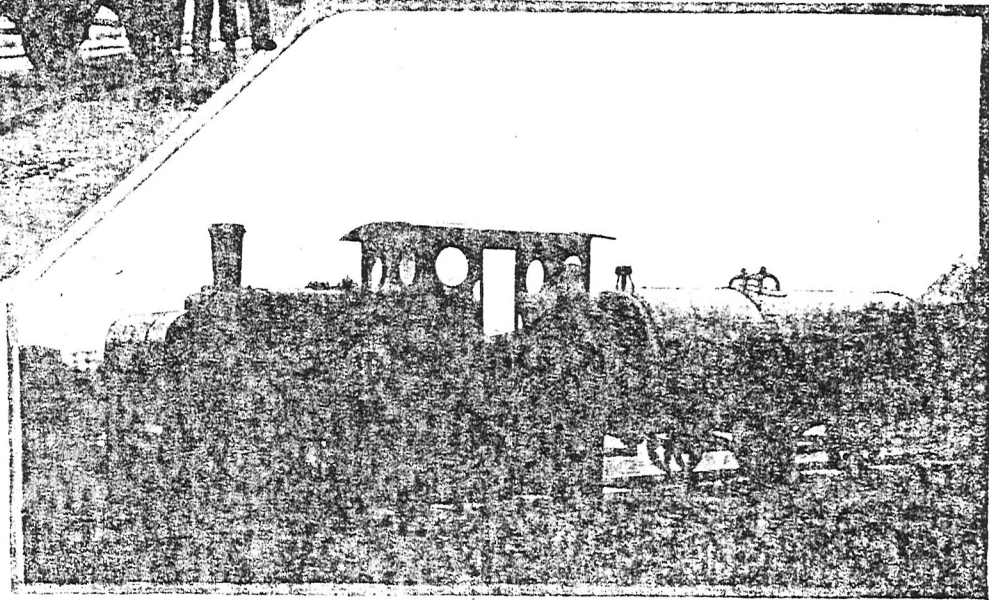
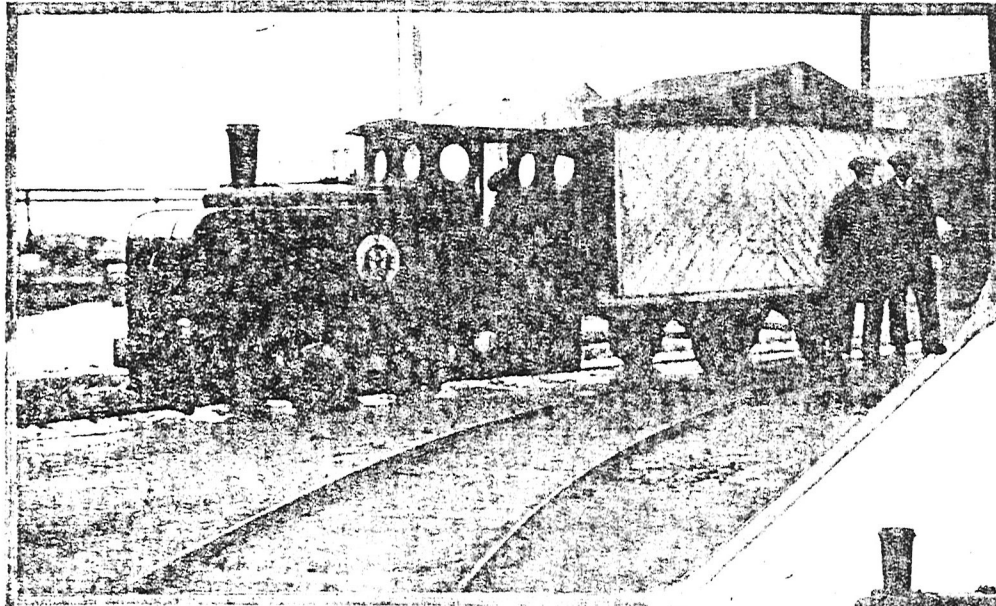


RUSTON 10 H.P. OIL LOCO. 3' 3" GAUGE

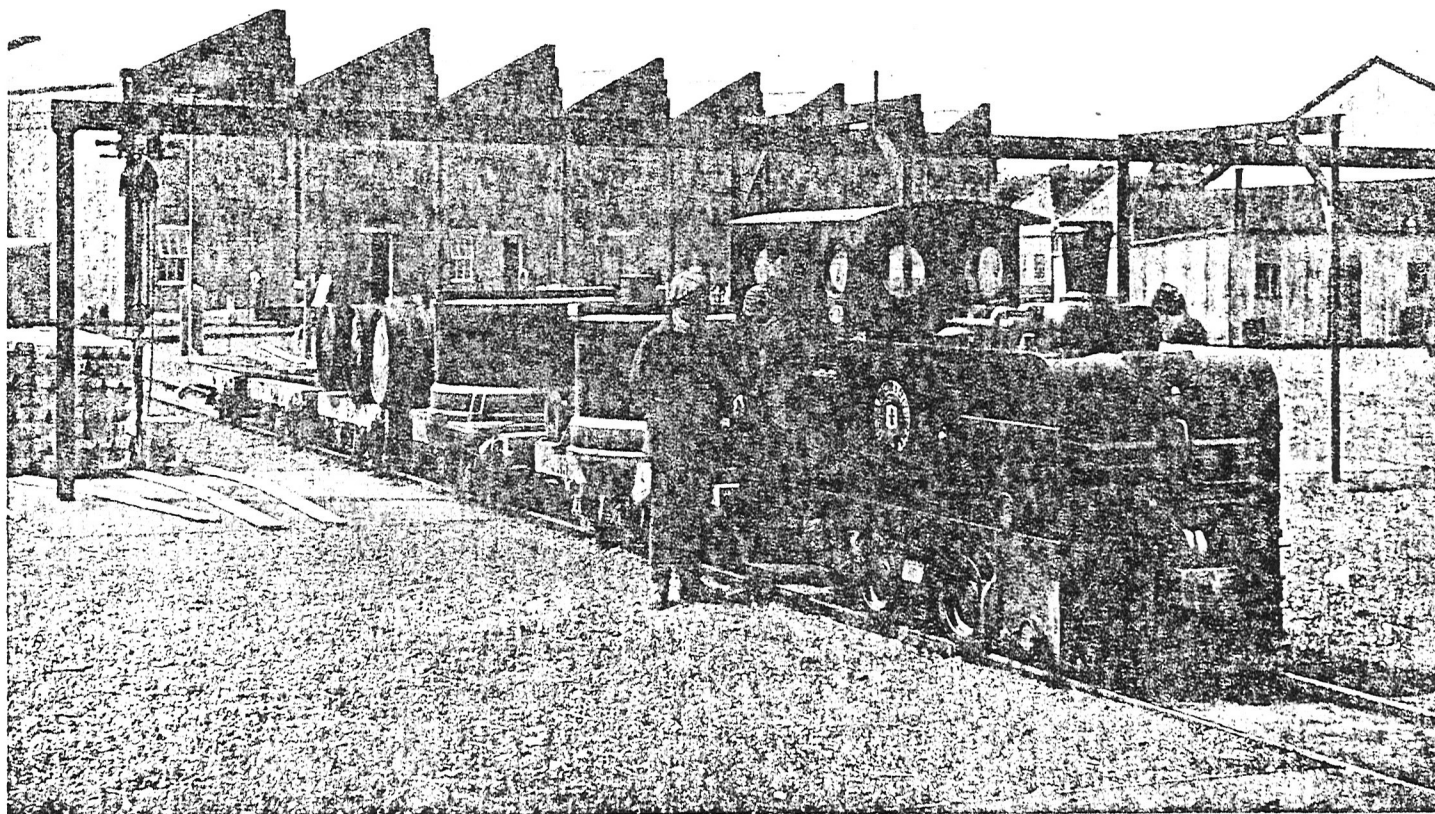


RUSTON 10 H.P. OIL LOCO HAULING COAL IN POWDER FACTORY. 3' 3" GAUGE

RUSTON 10 H.P. OIL LOCO AT WORK IN A POWDER FACTORY. 3' 3" GAUGE

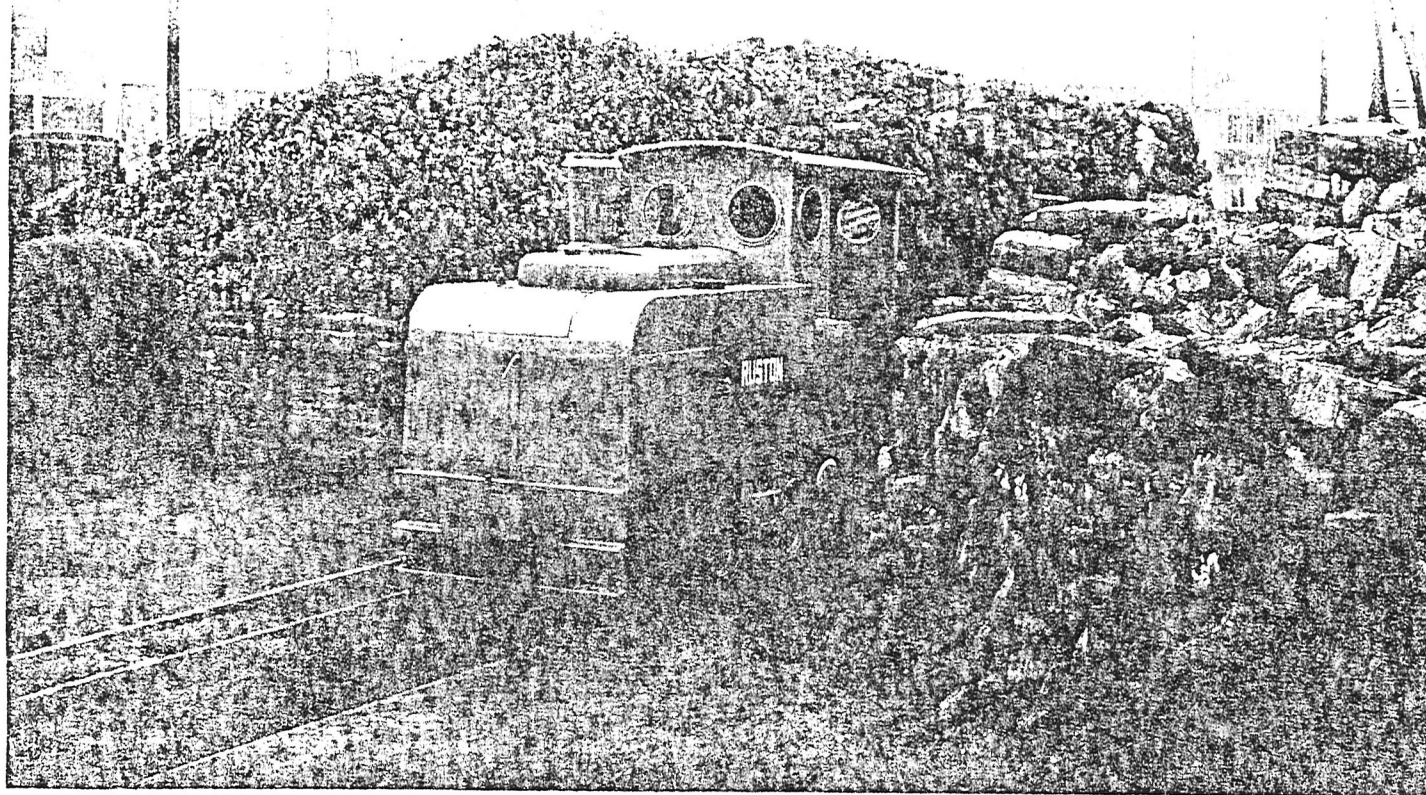


RUSTON 10 H.P. OIL LOCO HAULING ACID. 3' 3" GAUGE



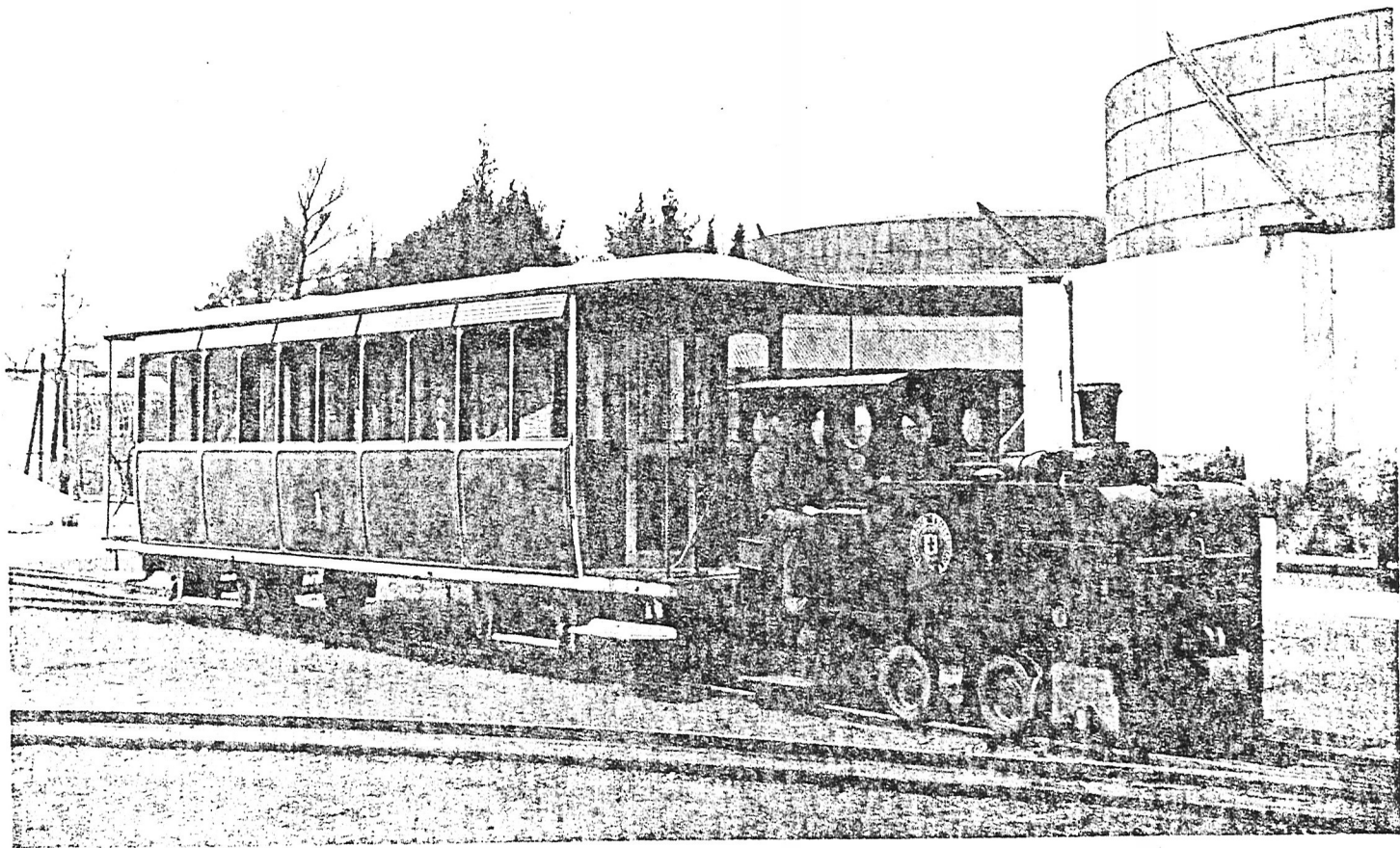
RUSTON 10 H.P. OIL LOCO. 2' 6" GAUGE





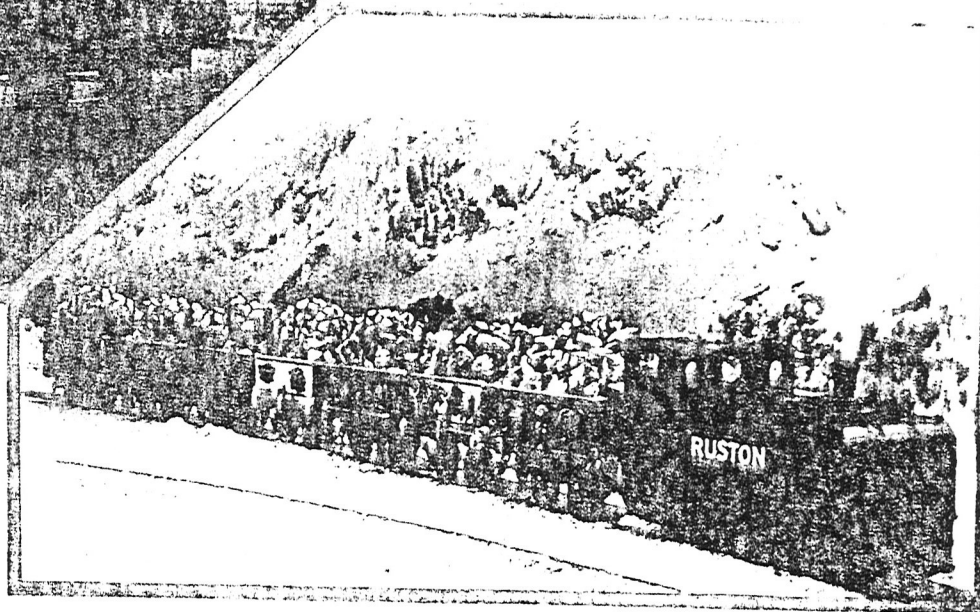
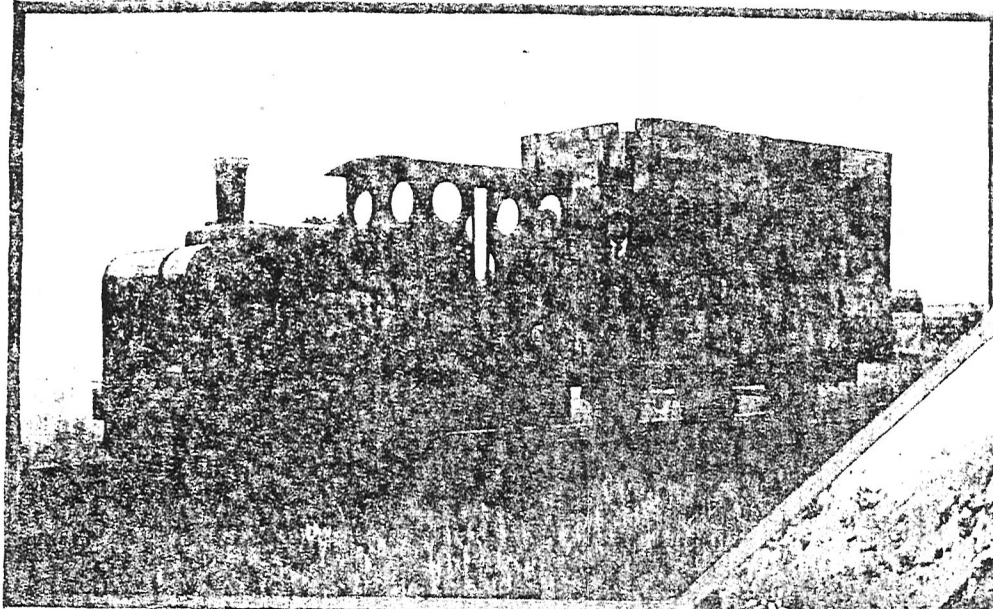
RUSTON 10 H.P. OIL LOCO DEALING WITH STOCK PILES. 3' 3" GAUGE





RUSTON 10 H.P. OIL LOCO ON PASSENGER SERVICE. 2' 6" GAUGE

RUSTON 10 H.P. OIL LOCO. 3' 3" GAUGE



RUSTON 20 H.P. OIL LOCO HAULING FROM LIMESTONE QUARRY. 2' 2 1/2" GAUGE

## HAULAGE HINTS

**T**HE advantage of wagons with roller bearings on rails is about 12 to 1 over a wheelbarrow.

A horse will draw about 25 cwts. on a level road, but 7 to 8 times as much on a light railway, and at least one-third faster than on the road.

A "Ruston" Oil Loco will haul 25 to 80 tons at speeds from 3 to 6 miles an hour.

**FRICTION.** The resistance due to friction on the level of the average permanent way is from 5 to 12 lbs. per ton, but with a track and rolling stock, as on light railways, this is usually from 18 to 22 lbs. per ton, though with a heavier track and better rolling stock it may have lower resistance.

**GRADES.** The resistance due to grades is generally taken as  $\frac{1}{100}$ , or 22.4 lbs. for 2,240 lbs. for each foot rise in 100 feet, *i.e.*, multiply the weight in tons by 22.4, and this will give the resistance in lbs. for each foot of rise in 100 feet.

**CURVES** give an additional resistance of from 5 to 15 lbs. per ton.

**RADIUS OF A CURVE.** It is necessary to know the radius of a curve to calculate the resistance. This may be found by the following formula:— $R = \frac{a^2 + b^2}{2a}$ , where *a* is the centre height of the chord in feet and *b* is half the base of the chord.

**DIRTY TRACK.** The track should be kept clear, for dirt below the rail head where the flanges of the wheel touch causes increased resistance.

**RAILS, SAFE LOAD.** Each 10 lbs. weight per yard of ordinary steel rail, properly supported by cross-ties (not less than 14 for 30-foot rail), is capable of sustaining a safe load per wheel of 3,000 lbs.

**RAILS, TONS PER MILE.** The following formula gives the weight of rails required to lay one mile of single track:—  

$$\frac{\text{Weight per yard of rail} \times 11}{7} = \text{tons of 2,240 lbs.}$$

## WEIGHTS OF VARIOUS MATERIALS.

**WATER.**—One gallon Imperial contains 277½ cubic inches and weighs 10 lbs.

**GRAVEL.**—One cubic yard weighs 3,300 lbs.

**LOOSE EARTH.**—One cubic yard weighs 2,500 lbs.

**CLAY.**—One cubic yard weighs 3,400 lbs.

**CHALK.**—One cubic yard weighs 4,000 lbs.

**COAL.**—One cubic yard weighs 1,400 lbs.

**WOOD.**—A cord of wood measures 8 feet in length, 4 feet in width, and 4 feet in height, and contains 128 cubic feet.


**LOGS.**—1,000 feet of green logs weigh 8,000 to 10,000 lbs.

RUSTON & HORNSBY LTD.  
 ENGINEERS  
 LINCOLN, ENGLAND

From .....

## RUSTON OIL LOCOS—ENQUIRY SHEET

When sending enquiries for "Ruston" Oil Locos, please furnish the following particulars. In answering questions numbers 8, 9, and 10, it would be better to send a plan of the line, and in answer to question number 11, a sketch of the buffer and draw-gear arrangement.

1. Net load to be hauled per train .. ..	
Net load to be hauled per day or hour	
2. Weight per loaded truck .. .. .	
Weight per empty truck .. .. .	
3. Maximum speed per hour .. ..	
4. Gauge of rails .. .. .	
5. Height of rails .. .. .	
Weight of rails per yard .. .. .	
6. Distance from centre to centre of sleepers	
7. Length of track .. .. .	
8. Steepest gradient and length of same for loaded trains .. .. .	
Steepest gradient and length of same for empty trains .. .. .	
9. Radius of sharpest curve .. .. .	
10. Cross-section of gallery in mines ..	
11. Buffer and draw-gear arrangement ..	