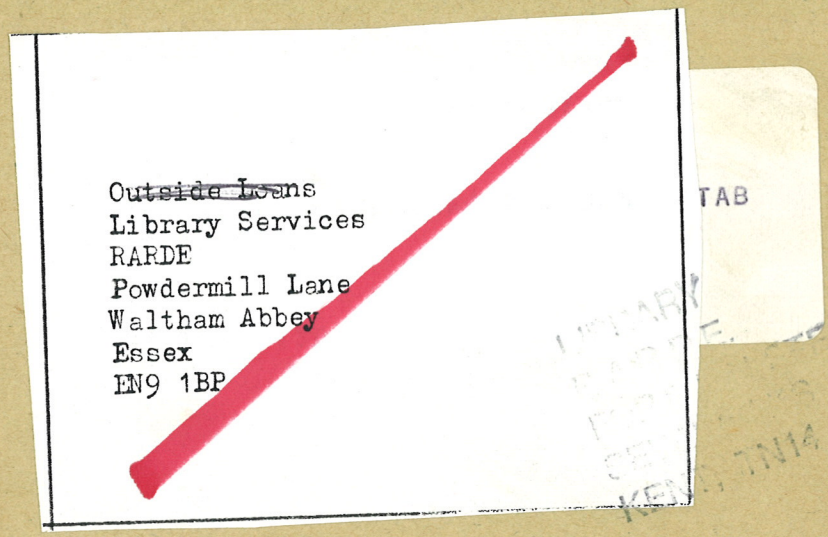
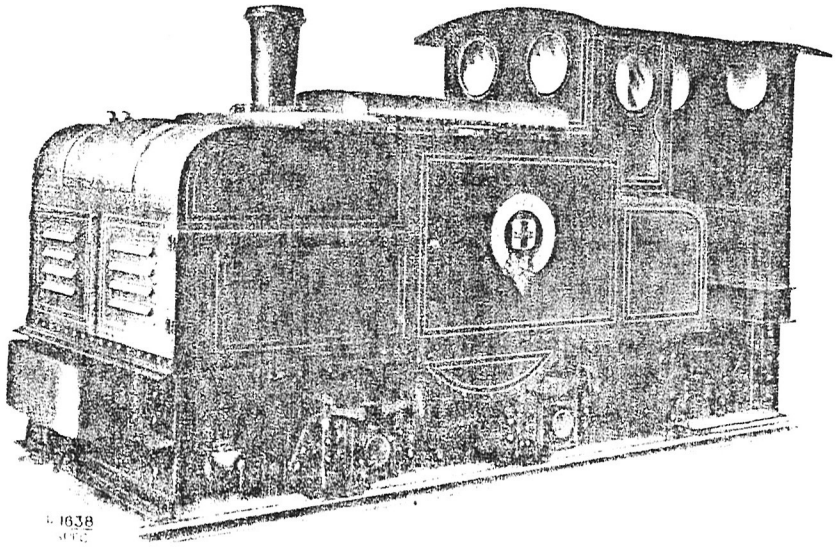


Publication No. 4057

The RUSTON Oil Loco

(INTERNAL COMBUSTION)

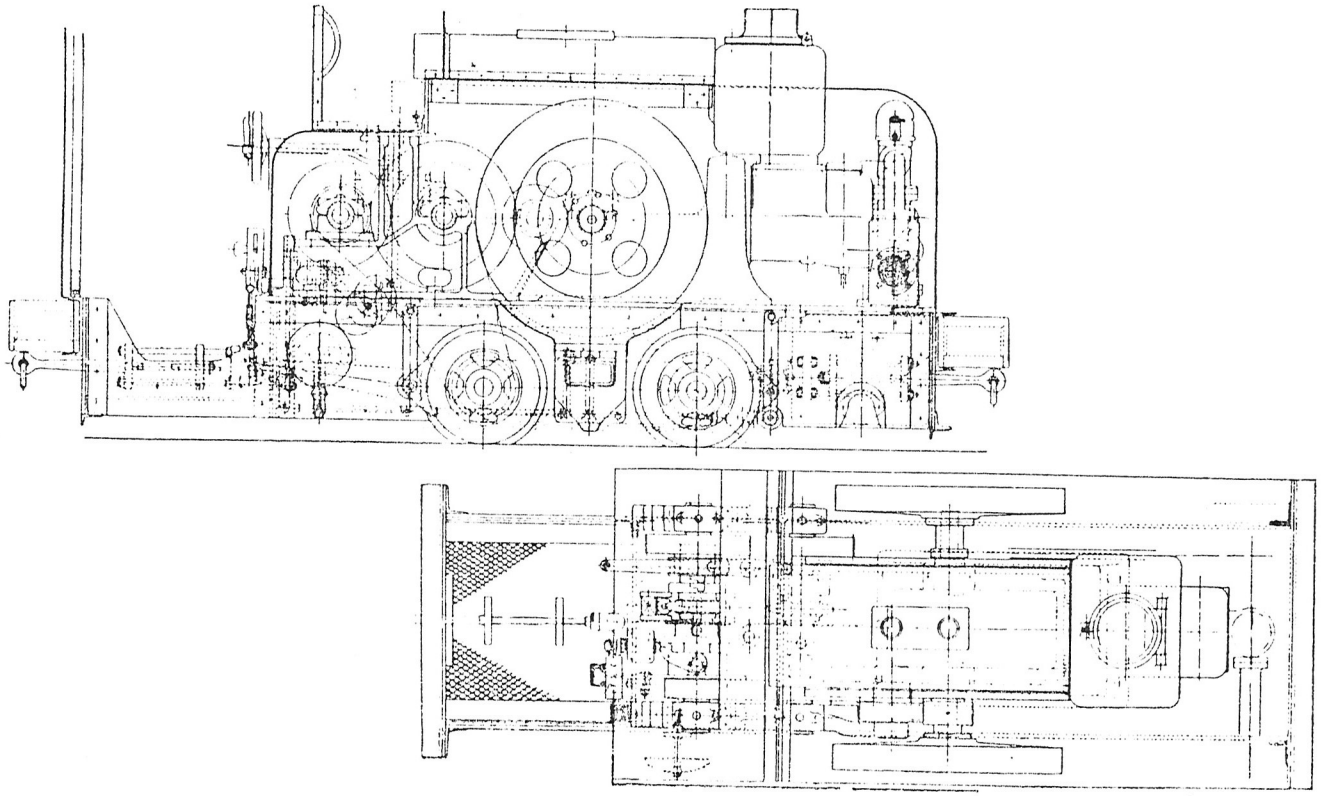
A Locomotive
for
Adaptability
Reliability
Simplicity



Has proved itself
a
Reliable Proposition
Real Puller . .
"Ruston" Product

A Locomotive for all Purposes. Using wide range of Fuel. Working on various Gauges.

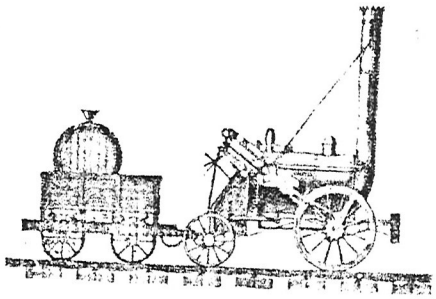
LIGHT RAILWAYS LTD., 3 LONDON WALL BUILDINGS, LONDON.



M. 2153.

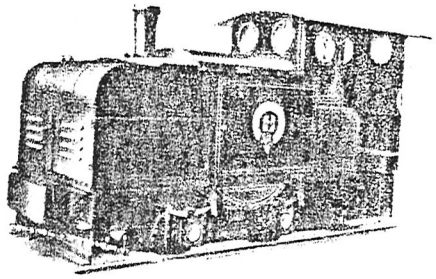
GENERAL ARRANGEMENT OF RUSTON 4 TON OIL LOCO.

FOREWORD.



A Hundred Years Ago.

1815 **1920**



To-day.

THAT "The Rocket" *was*, a century ago, the "Ruston" Oil Loco *is* to-day, the best haulage unit that can be obtained, built as it is by a firm whose records go back to the time of the first Steam Locomotive, and who through the intervening period have been building up a wide-world reputation for sound engineering products.

At no time in the world's history was the question of economical haulage of greater importance than it is to-day, and there is no doubt that it will remain one of the most important factors in industry. To meet the need thus created the Ruston Oil Locomotive has been designed, and as it will haul light and medium loads at moderate speeds, at the minimum cost, it commends itself to all who seek the maximum of efficiency. A comparison of the cost and work performed proves the Oil Loco to be a much sounder proposition than any other form of haulage, whether it be manual, horse, steam locomotive, motor tractor or power capstan.

Why the RUSTON Oil Loco Leads the Way.

Advantages of Ruston Oil Loco as compared with the Small Steam Locomotive are :

(A) The use of oil instead of coal.—Oil is a cleaner, more easily handled fuel, and does not deteriorate, and can be more easily stored and protected from pilferage, while it is more universal than coal.

(B) Instant starting from cold. No waiting to get up steam.

(C) No stand-by losses.

(D) No small steam boiler with attendant disadvantages such as risk of explosion, liability to Boiler Inspection Acts, and expensive overhauls.

(E) No skilled labour required. Driver has in some cases been replaced by a woman.

(F) Compactness.—Very important factor in mines and workings when space is limited.

(G) Less weight in proportion to power developed.

(H) No sparks to cause explosion or fire.

(J) Smaller quantity of water necessary and purity not essential.

(K) No flues to clean.

(L) No boiler to scale.

Some advantages of Ruston Low Speed Engine Locos as compared with Light Motor Tractor fitted with Vertical High Speed Engines.

(A) Greater engine flexibility due to heavier flywheels. This is of vital importance in shunting and starting.

(B) Lower fuel consumption.

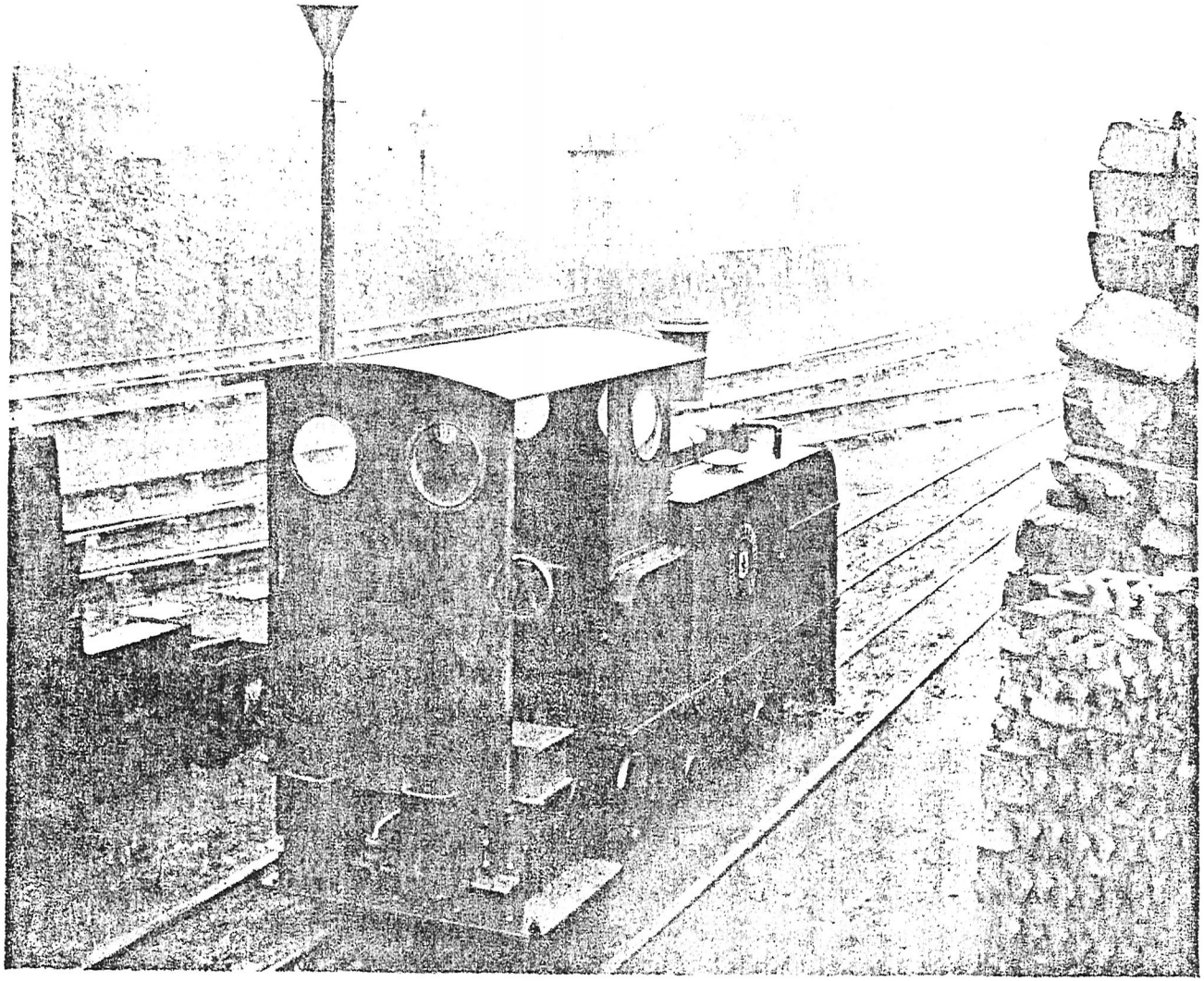
(C) Greater strength of frame, engine and gearing, with ability to withstand prolonged vibration, impacts when shunting and extended runs at full power,

(D) Wider range of fuels.

(E) Simpler Engine with less wear and tear due to lower crankshaft speed.

(F) Lower maintenance costs.

(G) More work in given period owing to less frequent breakdowns.



DESCRIPTION AND SPECIFICATION.

As will be seen from the Illustrations and Specifications, the Ruston Oil Loco is of massive construction and follows standard high-class Locomotive practice as regards general details. The frames are of steel plate, with horn guides and massive axle boxes properly sprung. The Engine is of the heavy, horizontal type, running at slow speed, and designed for using Petrol, Paraffin or Kerosine oils. There are two speeds in both directions, giving at normal engine crankshaft speed travelling speeds of 3 and 6 miles per hour, but capable of a higher speed by increasing engine revolutions. For this purpose a convenient control is provided. There are two exceptionally heavy flywheels, giving greater flexibility and enabling heavy loads to be picked up with ease.

Ignition is by magneto, no lamp being required for starting. The gearing is simple and very strong while the clutch is of a reliable and fool-proof type.

1 ENGINE

BEDPLATE. Massive box pattern construction, bored and faced simultaneously by (special machine) to receive cylinder and crank bearings. Perfect alignment assured.

CYLINDER AND LINER. Special close grained iron casting. Bolted to Bedplate. Bore for piston finished on special grinding machine.

GOVERNOR. New type Governor ; very sensitive ; adjustable for varying speeds while engine running. Governor also regulates heat of engine to suit load, thereby showing marked superiority over other governing systems, especially for light loads when using paraffin.

CRANKSHAFT. Machined from solid steel forgings ; accurately finished and balanced to reduce vibration. Finished bright all over.

FLYWHEELS. Two specially heavy flywheels. Face and edges machined.

CONNECTING ROD. Ample strength. Heavy bearings with large wearing surfaces.

PISTON. Close grained cast iron, ground to fit cylinders, and fitted with rings.

GEAR WHEELS. Machined from solid blanks of special metal. Lubrication adequate. Silent running.

BEARINGS. Specially designed. Give extra large wearing surfaces to obviate frequent adjustment.

VAPORISER. (Patent.) Simple design. Internal vaporising type, specially arranged for paraffin.

MAGNETO AND SPARKING PLUG. High tension type, with sparking plugs and variable trip gear for retarding spark at starting.

STARTING. No lamp required. For paraffin fuel a small petrol tank is fitted for starting on petrol.

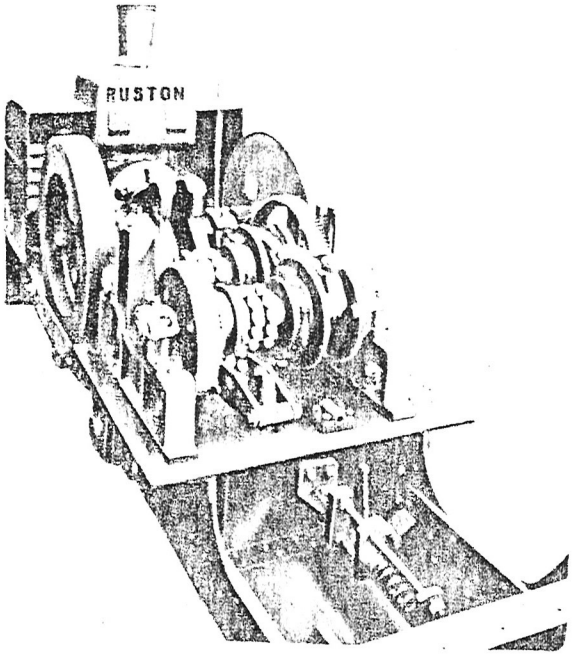
LUBRICATION. Ample provision made for complete lubrication of every wearing part.

CYLINDER COOLING. Water cooled. Cast iron water tank carried over cylinders ; dispenses with circulating pump and radiators of honeycomb or tubular type.

2 UNDER FRAME AND HOUSING.

UNDER FRAME. Steel frame. Plates riveted together by angles; stiffened by end plates; whole supported over axle boxes by leaf and coil springs.

AXLE BOXES. Gun metal bearings, housed in malleable iron shells which are flanged and slide in accurately machined horn blocks.



The Gearing.

RAIL WHEELS. Four wheels; Malleable iron centres; shrunk-on steel tyres.

ENGINE HOUSING. Engine and gears protected from dust and weather; enclosed in substantial housing fitted with sliding and hinged doors, permitting inspection of important parts.

COUPLING AND BUFFER GEAR. Designed to fit existing rolling stock.

BRAKE. Powerful hand controlled brake fitted; operates on all rail wheels.

SIGNAL GONG. Operated from cab.

RAIL SANDING. Foot controlled sand box over each rail.

DRIVER'S CAB. Adequate cover provided for driver, lubrication, and control gears.

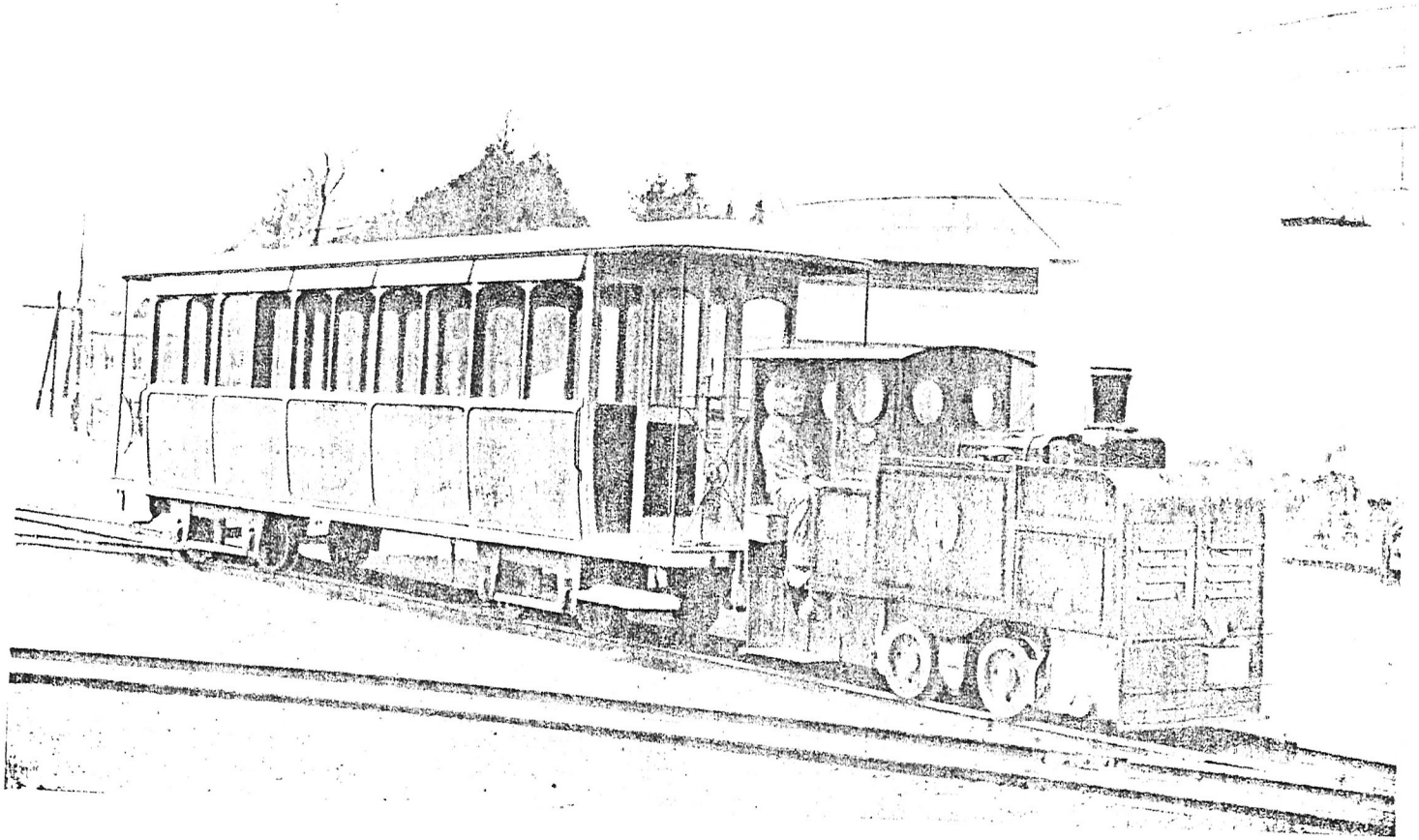
3 GEARING.

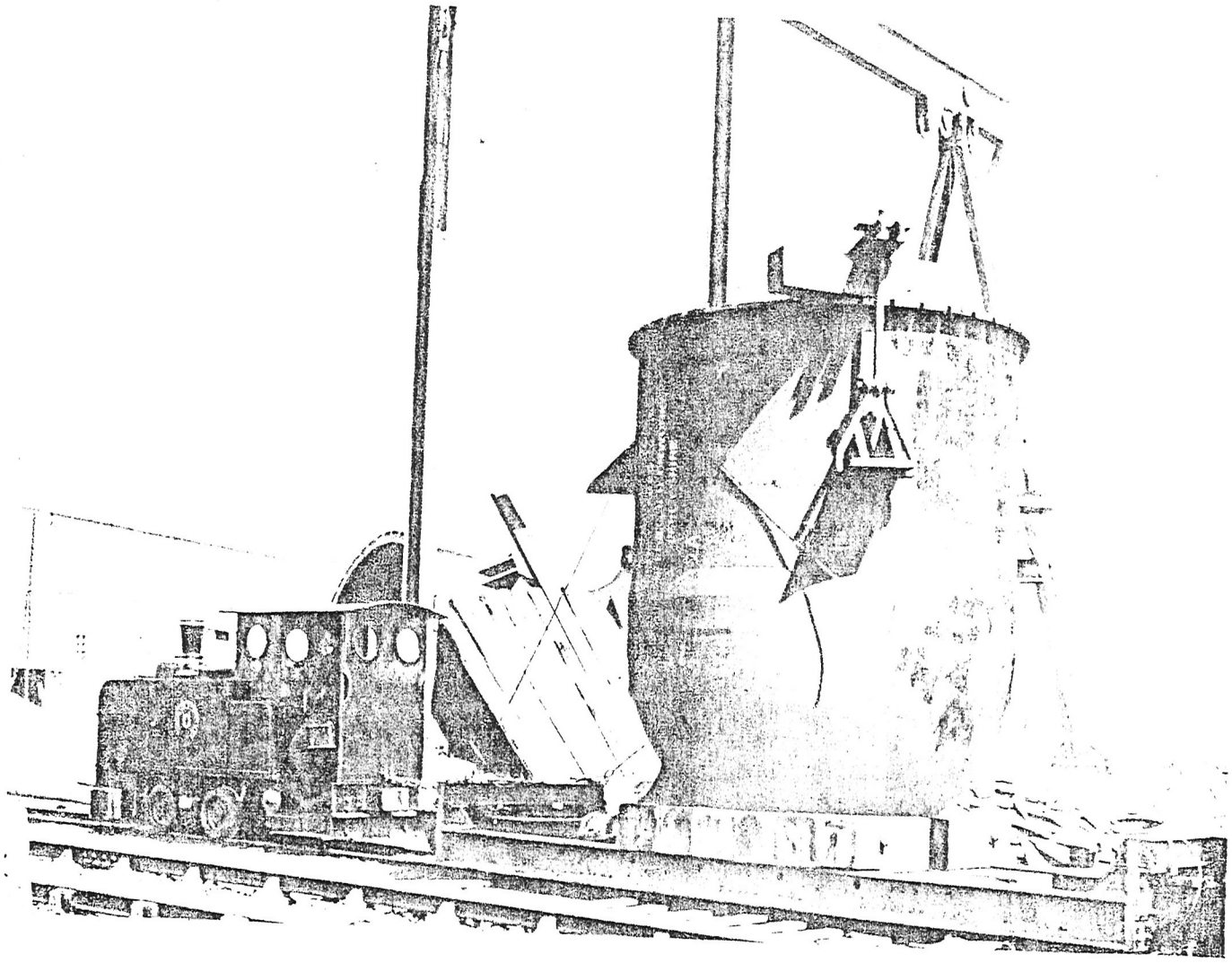
POWER TRANSMISSION. Power transmitted by machine cut spur wheels, through two clutch shafts, then to rear axle by chain. A second endless chain couples the rear and front axles thus transmitting power to all rail wheels. Speed changes effected by means of lubricated friction-clutches operated by handwheel in front of driver.

SPEEDS. Two speeds, forward or reverse.

LUBRICATION. Efficient lubrication regulated by sight-feed lubricators in driver's cab.

ACCESSORIES. 1 set springs; 1 set spanners; valve grinder; 2 oil cans; 1 lb. waste; fuel tank and piping; piston rings; 2 starting handles.

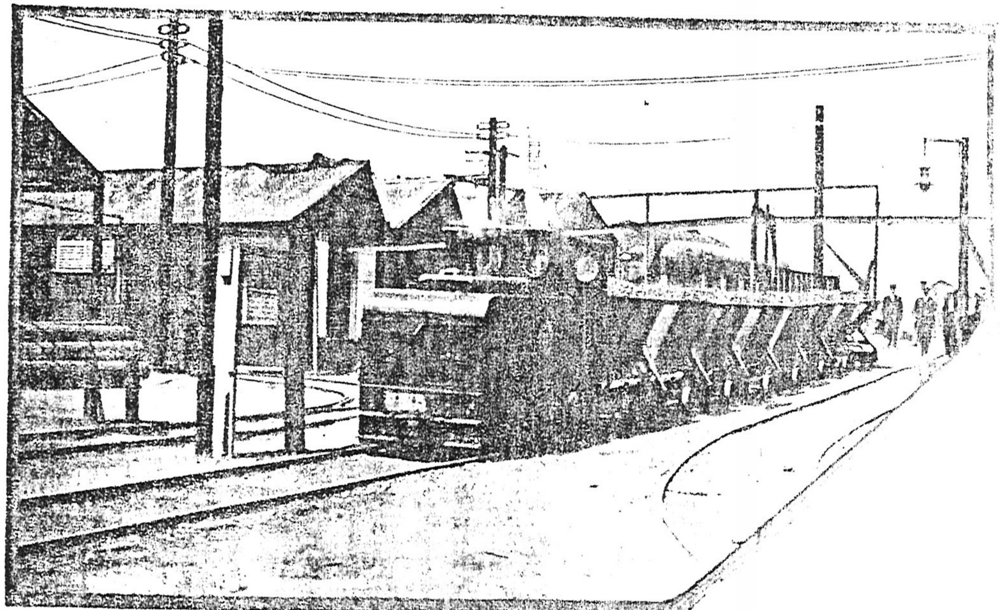




WHAT IT COSTS TO RUN A RUSTON OIL LOCO.

The following are actual working costs supplied by the user of a Ruston 4-Ton type Loco during the months of September, October and November, 1918, *i.e.*, for 13 weeks of 43 running hours, amounted to :—

	£	s	d
Fuel Oil—232 gallons at 1s. 9½d. per gallon	20	15	8
Petrol—16 gallons at 3s. 1d. per gallon	2	9	4
Lubricating Oil, 22 gallons at 1s. 9¾d. per gallon ..	1	19	10½
Maintenance cost, including overhauling and cleaning ..	2	0	0
Cost for 13 weeks ..	£27	4	10½



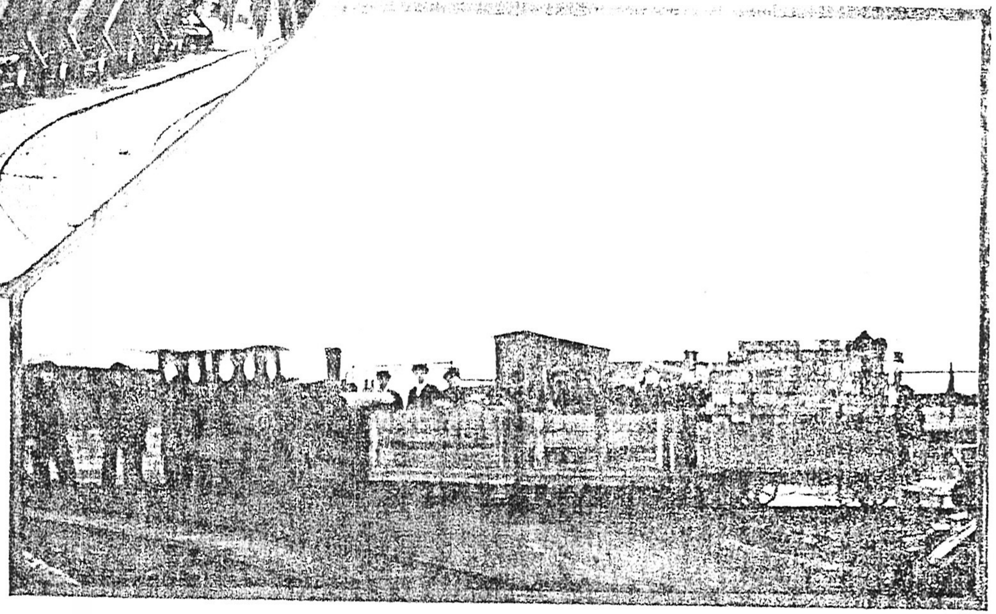
RUSTON 4-TON OIL LOCO HAULING COAL. 3′ 3″ GAUGE.

—ooo—

COST PER WEEK.

	£	s	d
Fuel, etc., as above, approx.	2	2	0
Driver's Wages—32s., plus 28s. 6d. War Bonus	3	0	6
Wages for boy employed on coupling up working points, etc.	1	2	3
Total cost per week ..	£6	4	9

No repair parts were required, although the Loco was continually at work hauling heavy loads, varying from acid retorted to baskets of laundry.



RUSTON 4-TON OIL LOCO ON GENERAL HAULAGE 3′ 3″ GAUGE.

WILL AFFECT YOUR PROFITS.

WHAT THE RUSTON WILL DO.

When deciding the size of a locomotive for any particular service, the H.P. of the engine is not indicative of the hauling power of the locomotive and this applies particularly to locomotives of the slow speed engine type. The Ruston engine has a considerably greater hauling capacity than the high speed engined locomotive of equal H.P., and consequently, when comparing its performance the only sound basis is the load actually hauled.

The Ruston Engine is specially built for haulage work and gives a greater drawbar pull per engine H.P. than the high-speed vertical engine used by other makers. This feature ensures reliabiltiy and lower fuel costs.

The 4-ton locomotive develops a constant drawbar pull of 800 lbs. and the 6-ton locomotive a drawbar pull of 1600 lbs. at 3 miles per hour.

The actual load hauled will depend upon the frictional resistance of the rolling stock and the condition of the tract. Under favourable circumstances. the resistance may be as low as 15 lbs. per ton hauled, and in others, as high as 30 lbs. per ton or more.

For average conditions, that is with rails reasonably well laid and of about 18 lbs. per yard for the 4-ton and 30 lbs. for the 6-ton loco, and with rolling stock, with lubricated axles, a resistance of 22 lbs. per ton should give ample margin.

The following table gives the load hauled with different frictional resistances :—

Frictional Resistance in lbs. per ton hauled.	**4-TON LOCO.** (Single Cylinder) Height over Cab 6′ 0″; Length 11′ 6″, Width 3′ 6″. Gross load hauled, in tons				
	On Level.	On gradients of			
		1% 1 in 100	2% 1 in 50	3% 1 in 33⅓	4% 1 in 25
15	50	19	10	6	3¾
22	35	15	9	5½	3½
25	30	14	8½	5¼	3¼
30	25	13	8	5	3
		Price £850 Code Word APRUN. (Packing 5% extra.)			

6-TON LOCO. (Twin Cylinder) Height over Cab 6′ 0″; Length 12′ 0″; Width 4′ 3″. Gross load hauled, in tons				
On Level	On gradients of			
	1% 1 in 100	2% 1 in 50	3% 1 in 33⅓	4% 1 in 25
100	39	22	14½	10
70	33	20	13½	9¼
60	30½	19	12¾	9
50	28	17½	12	8½
	Price £1155 Code Word APSAK. (Packing 5% extra.)