

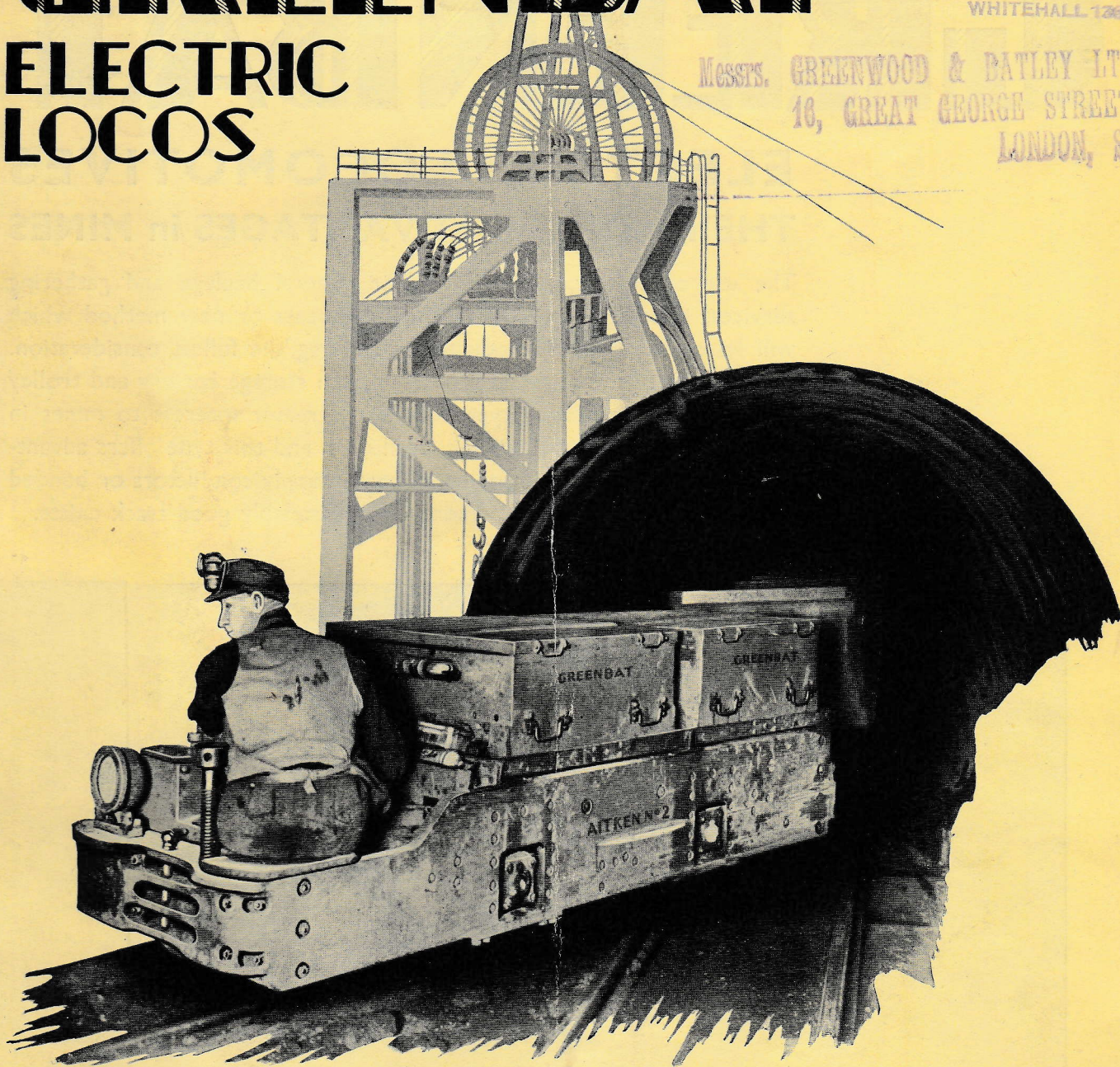
GREENBAT

ELECTRIC LOCOS

G. Y. S.
8 - MAY 1935

WHITEHALL 12021

MESSES. GREENWOOD & BATLEY LTD.
10, GREAT GEORGE STREET,
LONDON, S.W. 1

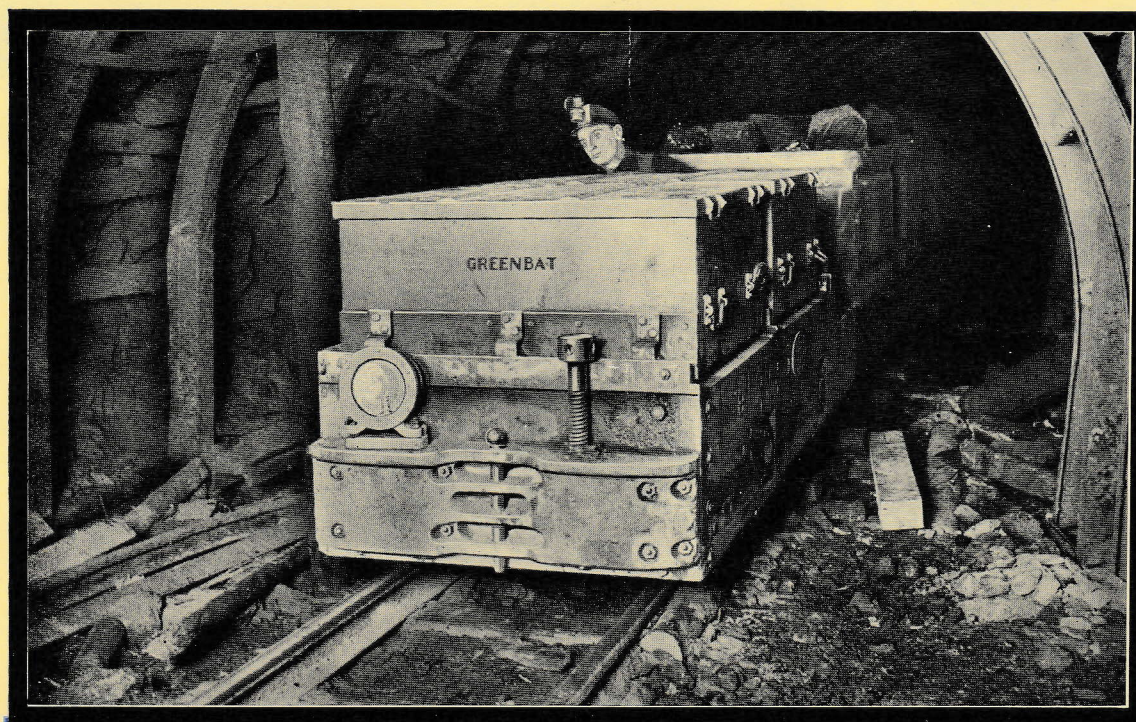


GREENWOOD & BATLEY LTD
ALBION WORKS
LEEDS
ENGLAND

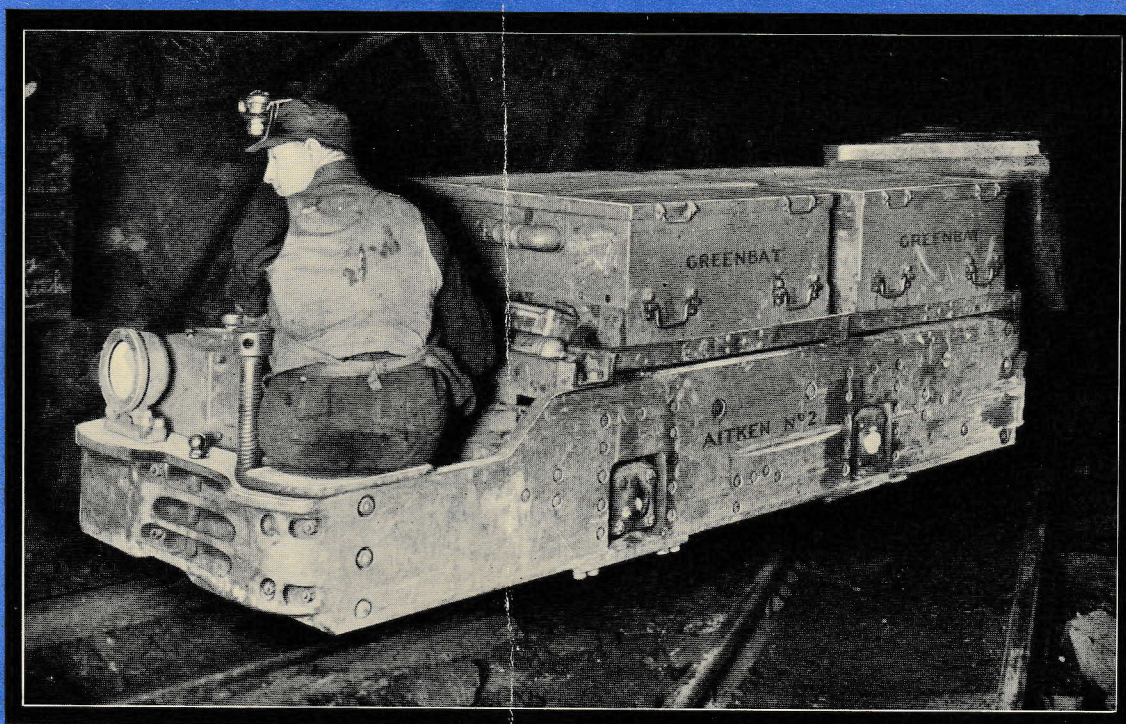
GREENBAT

ELECTRIC LOCOMOTIVES THEIR USE and ADVANTAGES in MINES

The use of Electric Locomotives for general haulage and gathering services, is to-day, together with any process or new method which will lessen the cost of production, receiving the fullest consideration. "Greenbat" Locomotives are made in both storage battery and trolley types. It is the former type that is of greater interest to mines in Great Britain owing to existing legislation, and this type offers advantages in that it does not require any bare supply conductors or bonded track, and is free to travel wherever a reasonably good track exists.



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Apart from the saving of direct labour the use of "Greenbat" Locos in place of auxiliary haulage and ponies can show very material increases in output and efficiency.

A "Greenbat" Locomotive means :—

More tonnage. Cleaner roads. Purer air.
Better light. No spragging on gradients.
No breaking harness.

When the gradients are favourable the advantages of Loco hauling over conveyor or rope haulages, either endless rope or main and tail, are very real. For any conveyor or rope haulage to operate to full advantage a reasonably straight double road is essential. Locomotive haulage gives practically the same efficient results on a road which is not straight as on a straight one and only a single track is required. A Locomotive haulage can be increased without difficulty, and a single haul or a short haul can be undertaken without starting up the whole system. Any road can be cleared quickly and with little labour, and where owing to twists and turns,

Continued overleaf.

**YOUR ELECTRIC HAULAGE CAN BE EXTENDED TO THE
FURTHEST CORNER OF THE MINE BY GREENBATS**

ALBION WORKS LEEDS

more than two haulages are required on any road the electric loco can show a definite saving, and in one **British Coal Mine** the installation of a **"Greenbat" Loco** on one road, released three haulages, two of 15 horse power and one of 25 horse power, with an actual saving in wages of 1.14 pence per ton of coal hauled, which represents a saving of over £800 per annum in actual wages.

It is a fallacy that electric locos need perfect roads. Good roads are, of course, always an asset, but "Greenbat" locos are running very satisfactorily on roads laid for rope haulage and having only 30 lb. rails, without any additional capital expenditure on roadway or road upkeep.

Certain approved types of rope haulages are used for riding men to the face from the pit bottom and back at the end of a shift. "Greenbat" Mining Locos are most suitable for this work. Local control instead of distant, flexibility in the event of any alteration of route, and brilliant illumination add to the greater safety offered by Loco haul; and where the numbers and distance warrant it, a track can be laid in the second intake airway leaving the main road free for coal hauling.

"GREENBAT" MINING LOCOS are of **standardized construction** throughout. They are designed and manufactured to suit the conditions met with underground, and they are the result of careful collaboration between mining experts and practical engineers.

They are British through and through.

The following pages describe various types and features of "Greenbat" Mining Locomotives.



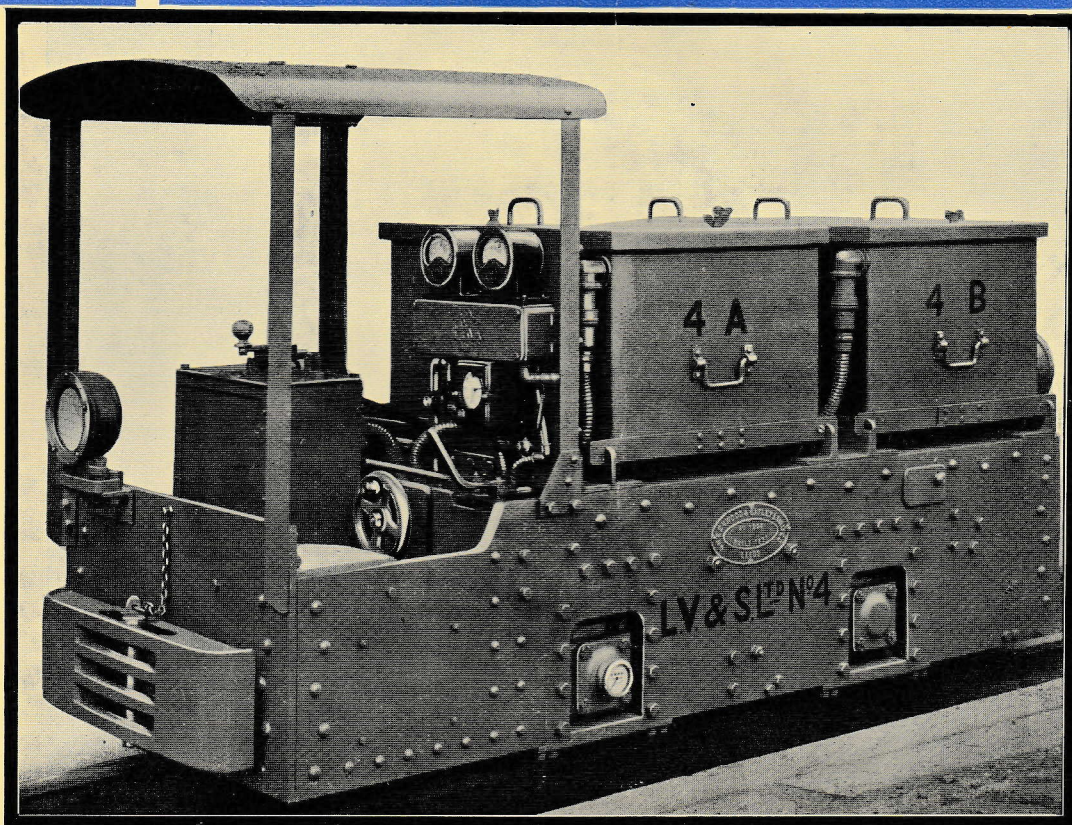
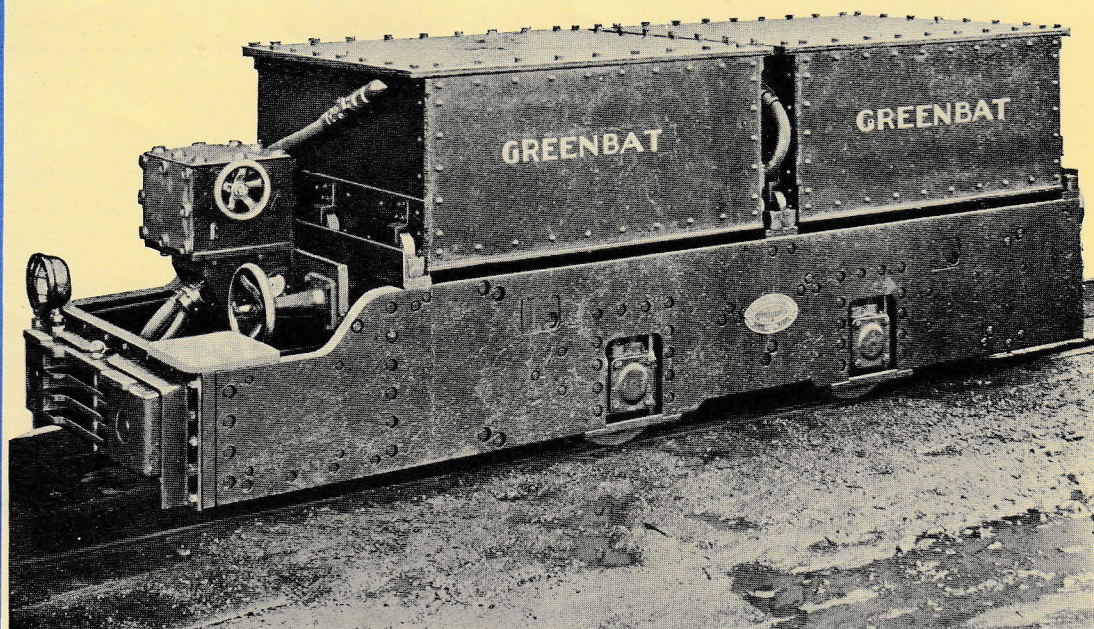
"GREENBAT" FLAMEPROOF MAIN HAULAGE BATTERY LOCOMOTIVE. Weight 8 tons. Drawbar pull 2100/2600 lbs.

In workings where Rules 127 and 132 of the 1911 Coal Mines Act apply, it is necessary to have all electrical gear of "flameproof" construction. The locomotive illustrated at the top of the opposite page, is designed to meet such conditions. The rugged construction, the entire absence of side projections, together with lightness of control, ensured the popularity of this locomotive and several of these have been supplied to overseas collieries. Powerful compensated brakes, five running speeds in either direction, sanding to all wheels, spring buffers, grease gun lubrication and adequate lighting are a few of the more noteworthy features.

"GREENBAT" 3 TON BATTERY LOCOMOTIVE.
Weight 3 tons. Drawbar pull 600/1200 lbs.

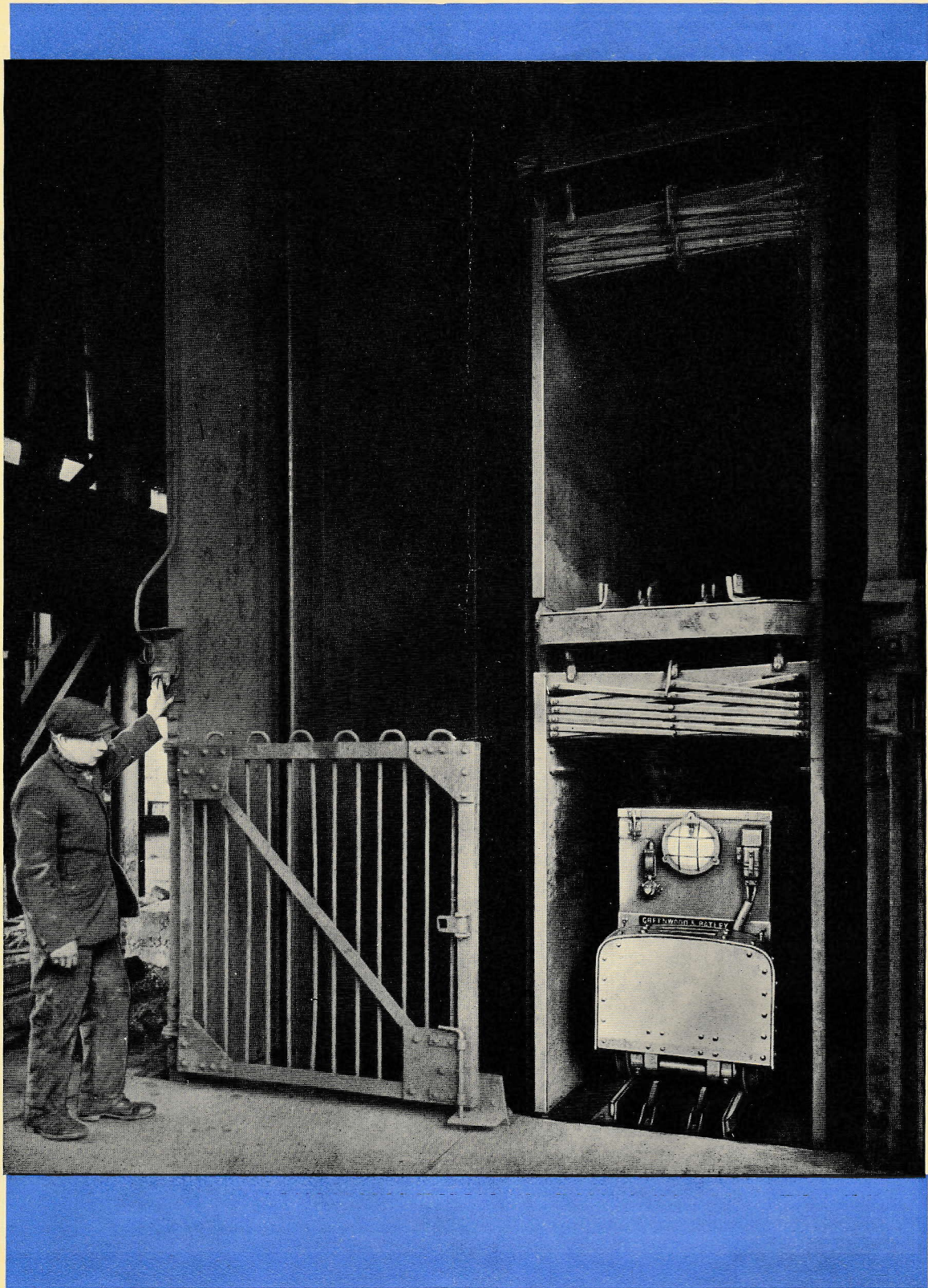
Where space allows, a canopy over the driver's well will protect him from wet and dirt. The locomotive illustrated at the bottom of the opposite page, is one of several "Greenbats" installed in the Gold Mines of Western Australia.

**GREENBAT
FLAME-
PROOF
MAIN
HAULAGE
LOCO**



**GREENBAT
3 TON
BATTERY
LOCO**

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"GREENBAT" TRAMMING LOCOMOTIVE

Weight $1\frac{3}{4}$ tons Drawbar pull 360/700 lbs.

The "Greenbat" little Trammer or Gathering Locomotive illustrated below and on the opposite page, is specially designed for working where space is limited, or where transport to different levels is desired. The short wheel base and small dimensions allow short radius curves to be taken and narrow seams to be explored. Full protection against splashing and dripping water is given, and, as is evident from the illustration, the transport of these locomotives in a small cage is very simple owing to the driver's well folding up. The 20" gauge locomotive closed up measures only 4ft. \times 2ft. 4ins. \times 4ft. high.



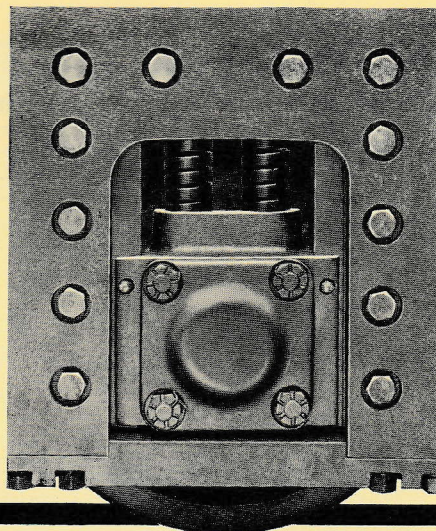
ALBION

WORKS

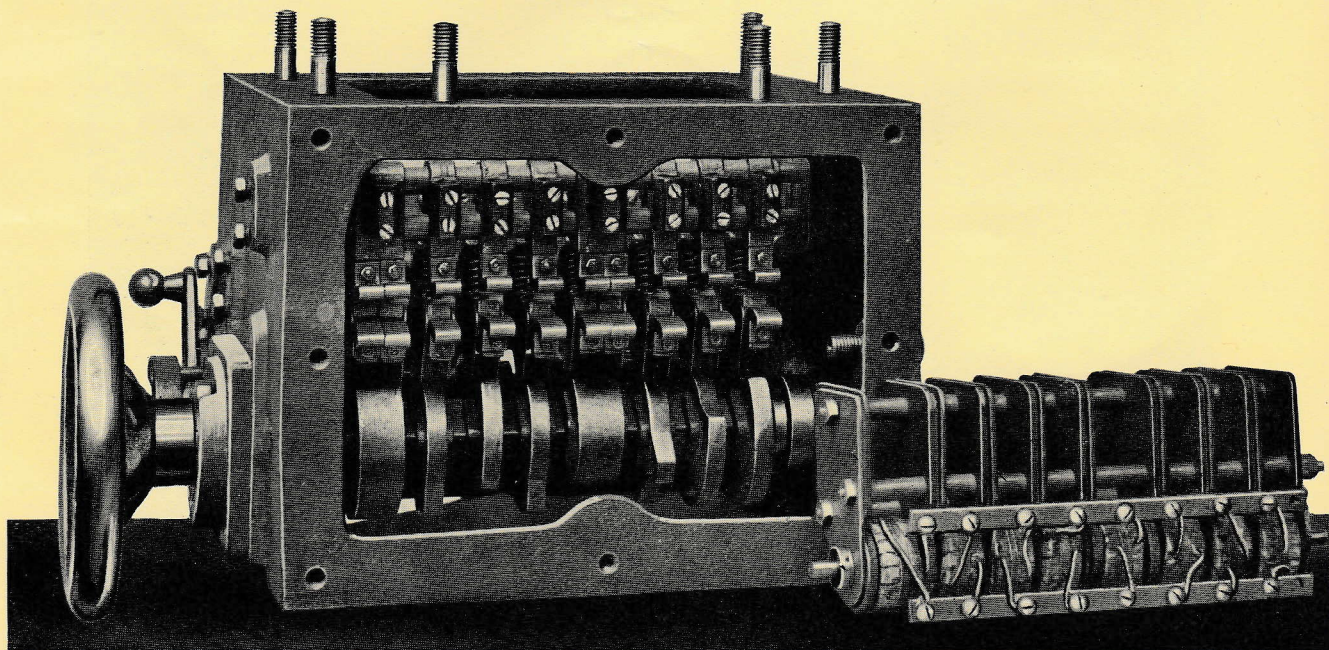
LEEDS

NOTHING TO GO WRONG NOTHING TO BREAK OFF

A detail of "Greenbat" construction. The cast steel axle box as illustrated is fitted with roller bearings and is carried in machined guides with renewable facings. The frame is supported on powerful double helical springs and provision is made for grease gun lubrication.



The ideal locomotive controller should be sturdy, compact, accessible, fool-proof, and above all, reliable. Our experience indicates that the cam contactor type controller most nearly fulfils these requirements, and we have designed the "Greenbat" controller specially for use with our locomotives. With the specially designed rolling action of the contacts and powerful magnetic blowout, the controller can be operated for long periods without attention. The "metal and mica" construction is in accordance with the highest class modern practice. The reversing drum is interlocked with the main drum and the reversing handle forms a key which, when removed, locks the controller in the "off" position.



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“GREENBAT” MOTORS HAVE BEEN IN USE SINCE 1880.

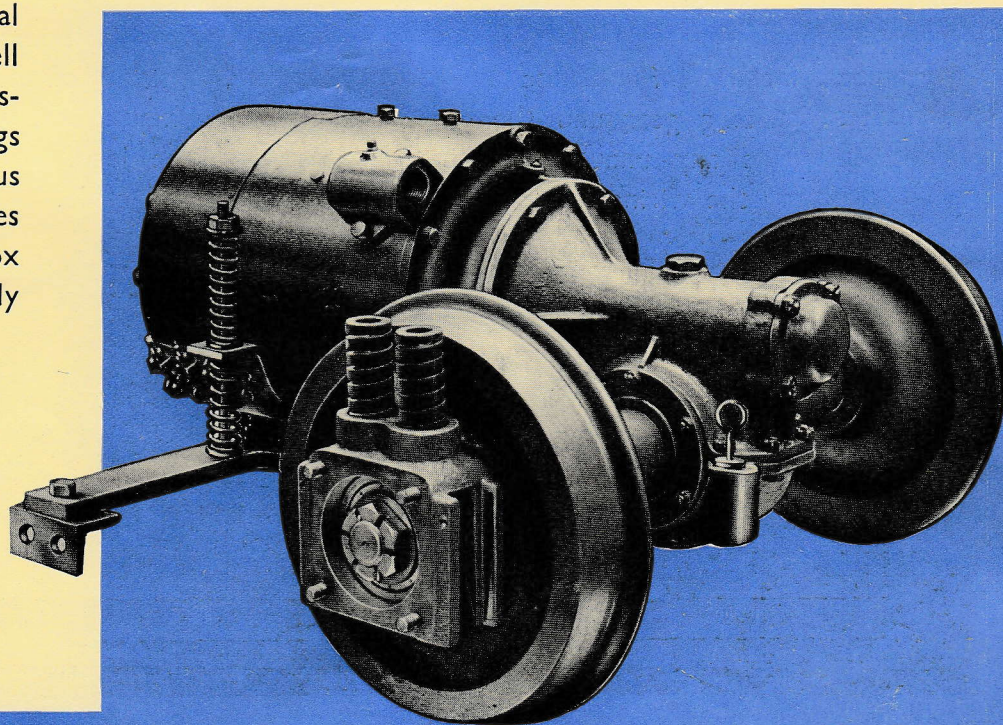
The accumulated experience of manufacture and performance is embodied in the motors fitted to these Locomotives. Silence, economical running, minimum wear of commutator and brushes, laminated main poles, impregnated windings, and long life and reliability are noteworthy features.

The robust construction of “Greenbat” motors is well illustrated overleaf.

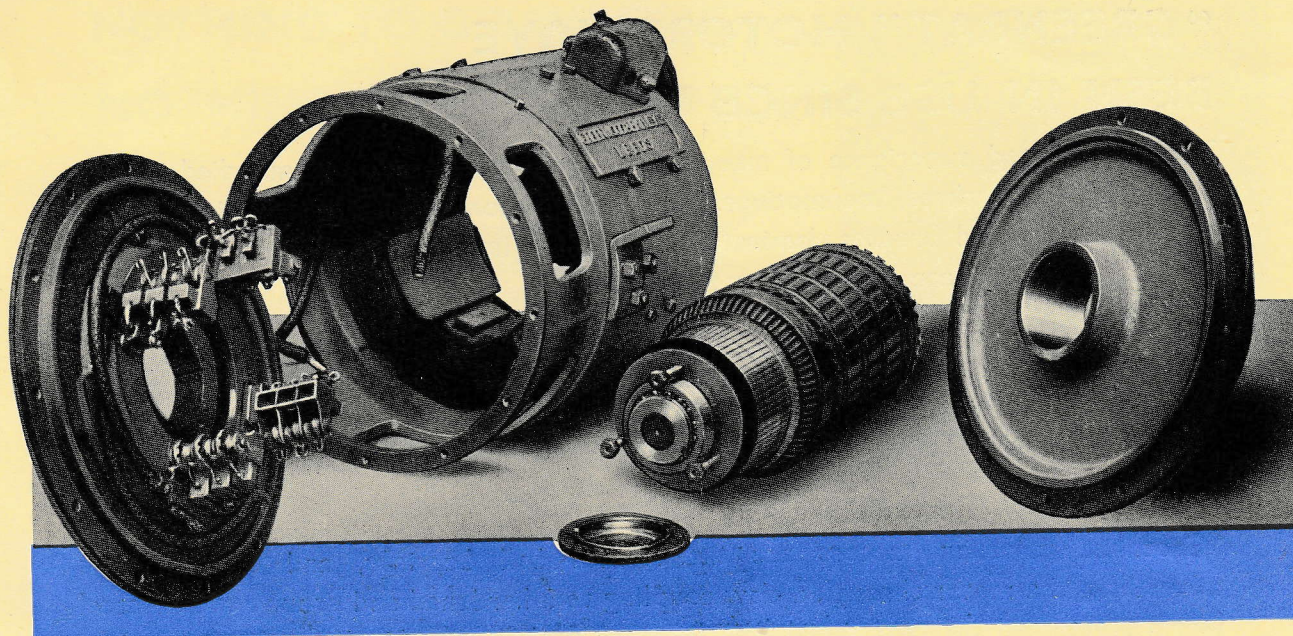
IN “GREENBAT” LOCOMOTIVES THE DRIVING MOTOR AND AXLE ARE OF UNIT CONSTRUCTION.

“Greenbat” traction motors are fitted with ball bearings, and the drive is taken from the motor through a claw coupling to a hardened and ground nickel steel worm supported on two radial ball bearings with a double thrust bearing. The Special Manganese bronze worm wheel is connected to a steel hub which is pressed on the axle. A cast steel housing has two heavy ball bearings and provision is made for taking side thrust. All the bearings are dust and water proof, and the worm gear runs in an oil bath, the depth of which is ascertained by the dip rod shown in the illustration.

Powerful helical springs as well as the motor suspension springs and the generous machined guides on the axle box are also clearly shown.

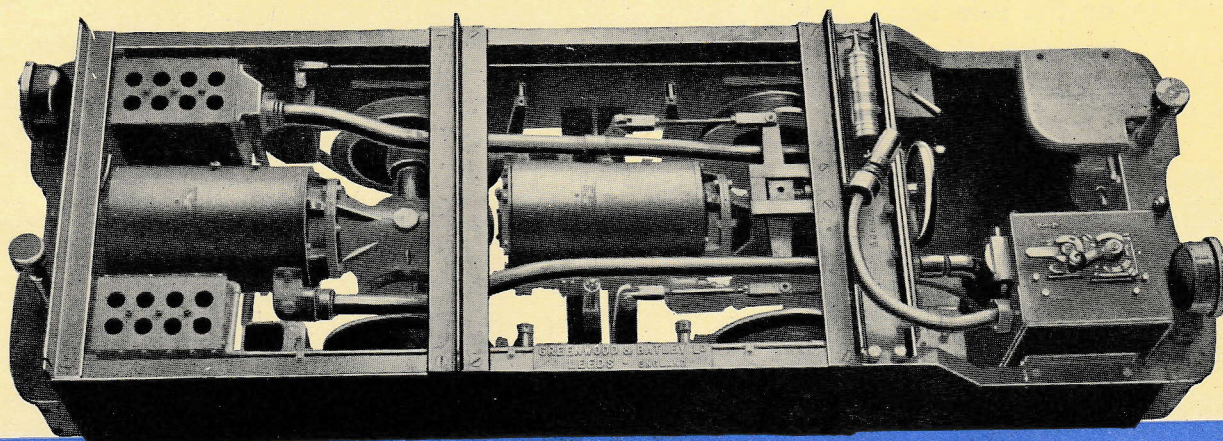


ALBION WORKS LEEDS



GENERAL ARRANGEMENT OF "GREENBAT" LOCOMOTIVE.

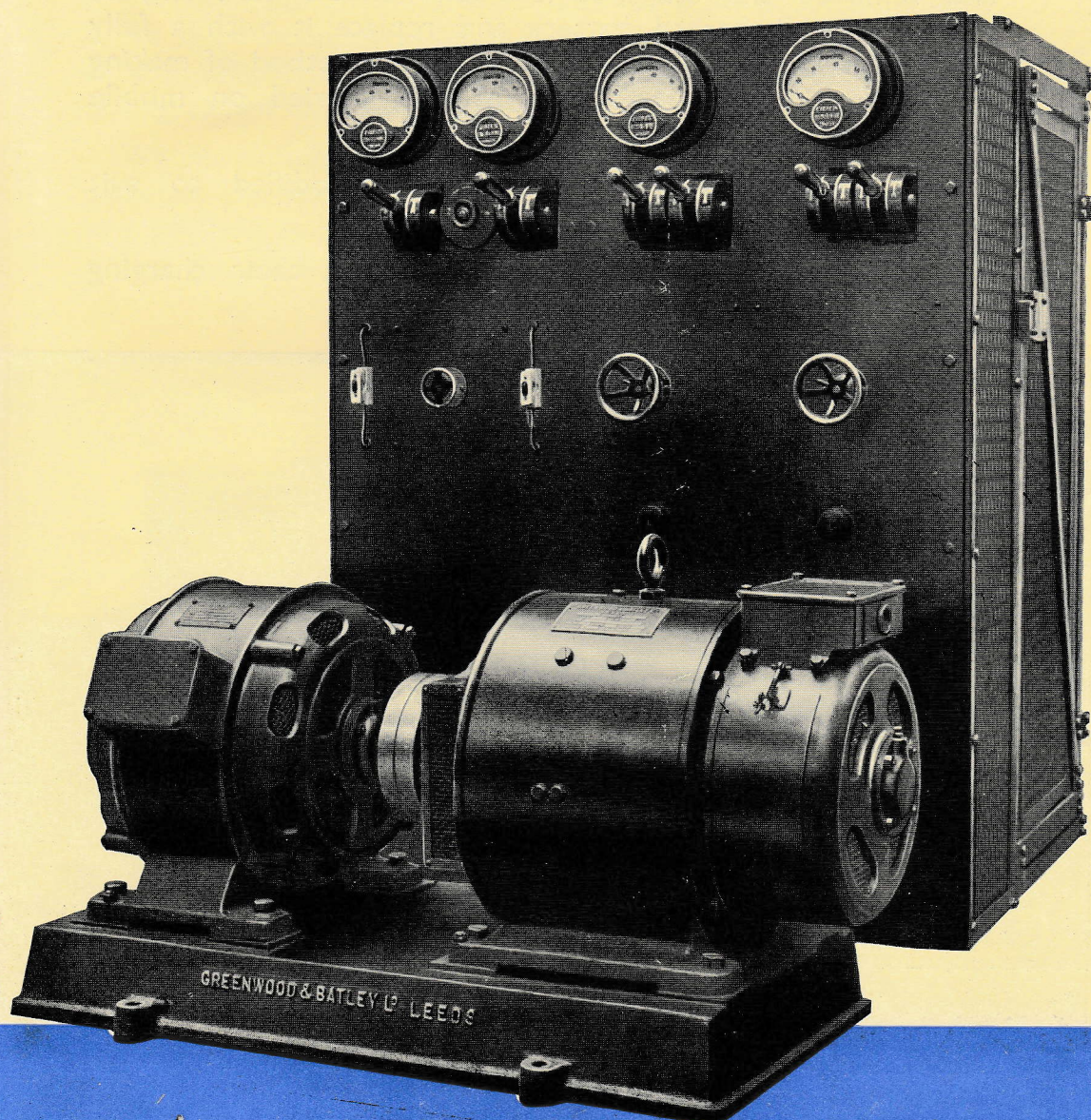
The Drive is by one or two motors depending upon the duty. Below is the two-motor drive arrangement. The illustration shows clearly the lay-out of the various units, indicates the sturdy construction of the frame, and it also serves to show the simplicity of control, the equipment, compensated brake arrangement, location of the fuse and circuit breaker, position of the jacks, fire extinguisher, sanding gear and the detachable reversing key which, when not in position, prevents any unauthorised interference with the loco. It is standard practice to carry the wiring in screwed conduit or armoured cable.



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CHARGING EQUIPMENT.

A typical battery charging set for use on an alternating current supply. Dynamo and motor are fitted with ball and roller bearings and a flexible coupling, and the switch panel is of the "dead front" type arranged for semi-automatic operation. The unit is designed to charge one or two batteries, and is so arranged that each battery, when fully charged, is automatically disconnected from the line and the set shut down when the last battery is charged.



ALBION

WORKS

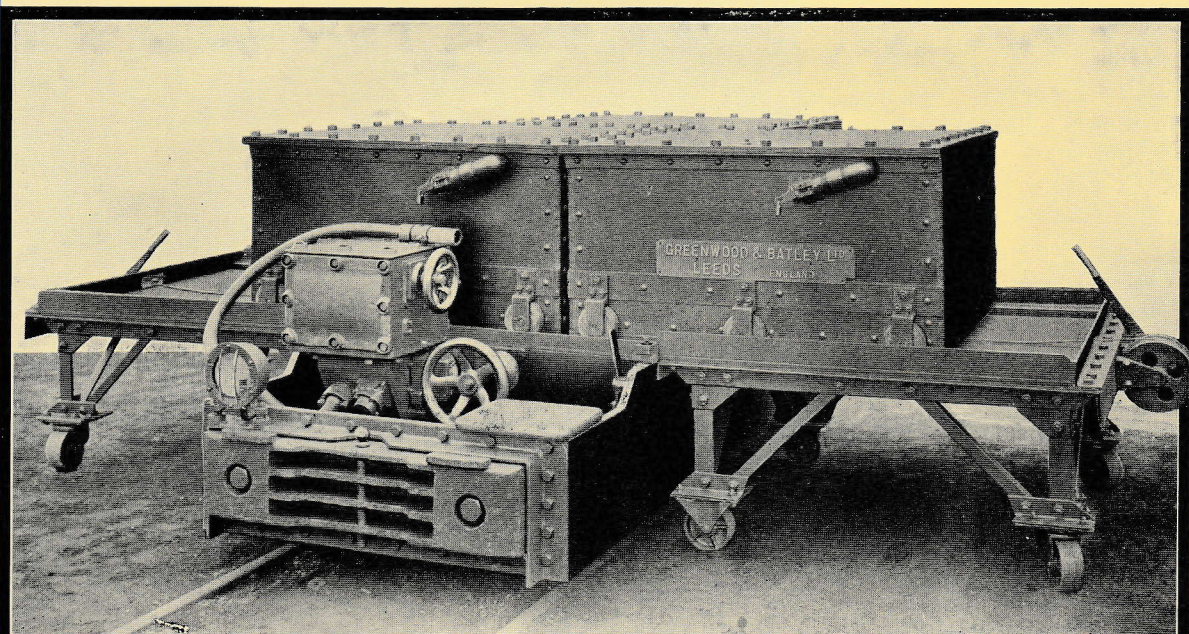
LEEDS

COAL OR GOLD ARE MINED CHEAPER WITH "GREENBAT" ELECTRIC LOCOMOTIVES.

The battery containers are mounted on rollers which are fitted with ball bearings. Having withdrawn the connecting plugs and removed the stops, it is a few minutes' task only to remove the discharged battery and replace it with a fully charged one. The illustrations show the method of making the change where the batteries are carried on mobile tables.

The arrangement, obviously, can be modified to suit conditions.

On all matters connected with Batteries, their charging



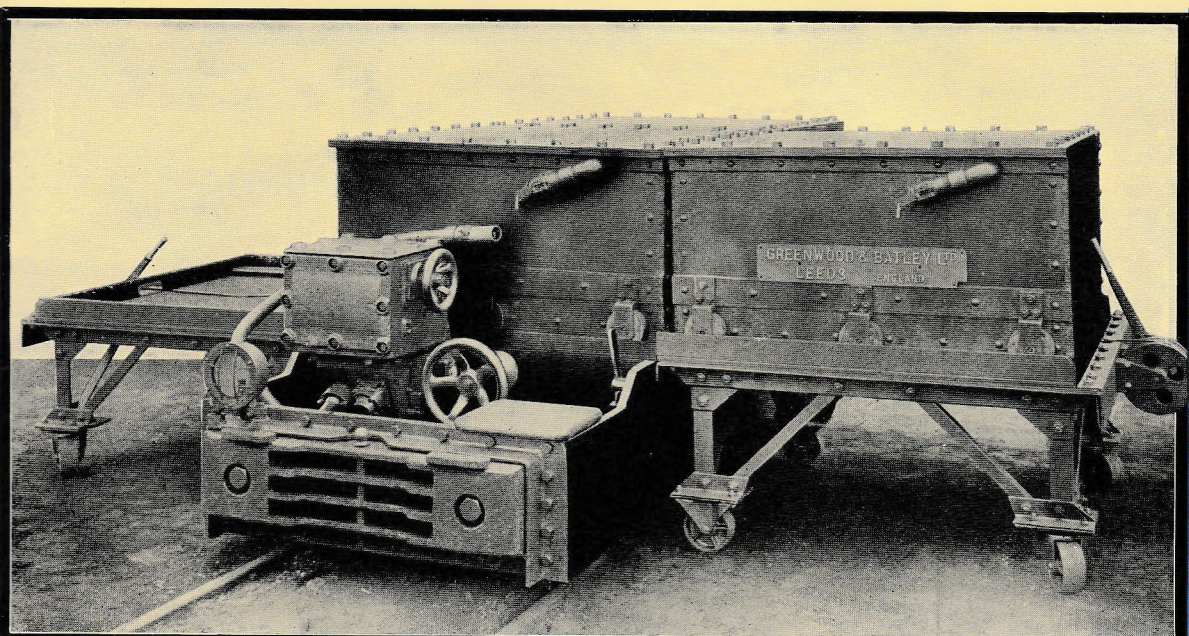
GREENWOOD & BATLEY LTD

SEMI-SKILLED OR UNSKILLED LABOUR CAN DRIVE AND CONTROL A "GREENBAT."

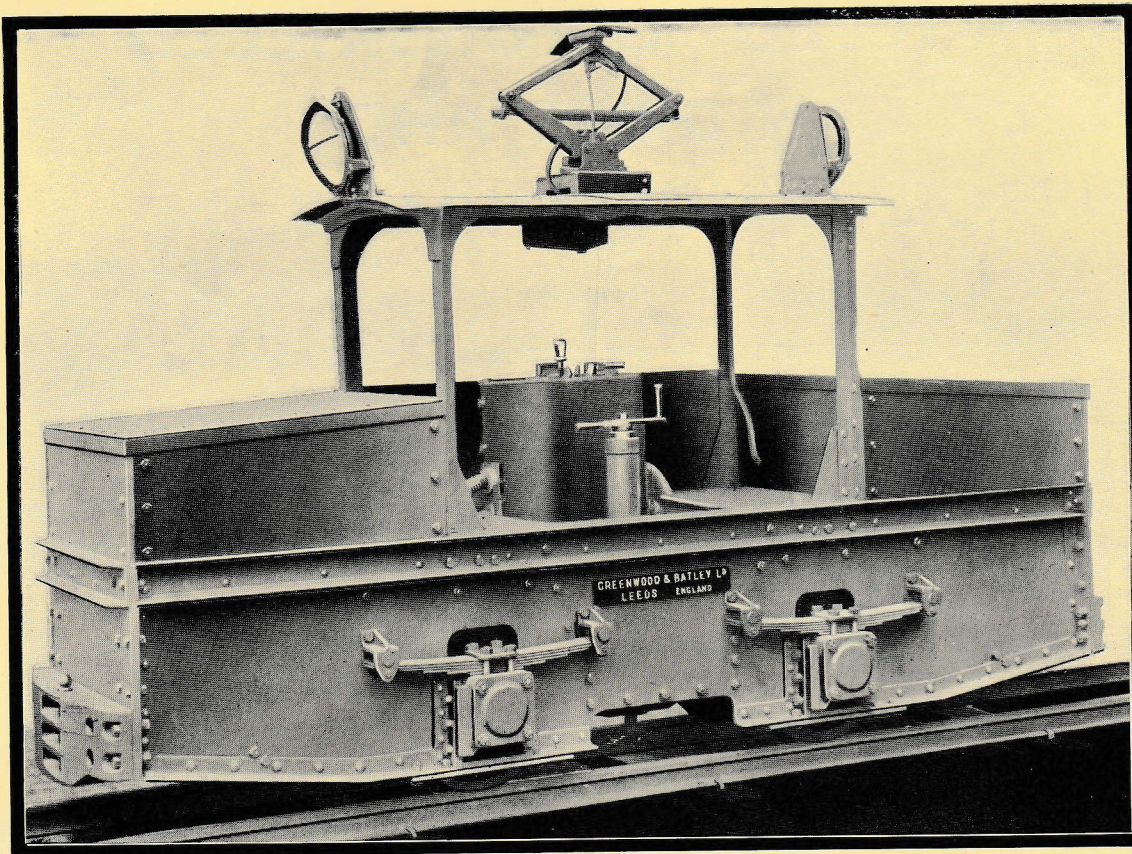
and changing over arrangements, our experience will be found to be of the utmost value.

Many years of successful application to these problems enable us to draw upon a wealth of data in the solution of problems of this nature and our advice is freely at the disposal of mine managers and engineers.

We have unique experience in the fitting of all types of batteries to electric trucks, tractors and locomotives and are in a position to give unbiased advice upon the application of all makes of accumulators.



ALBION WORKS LEEDS

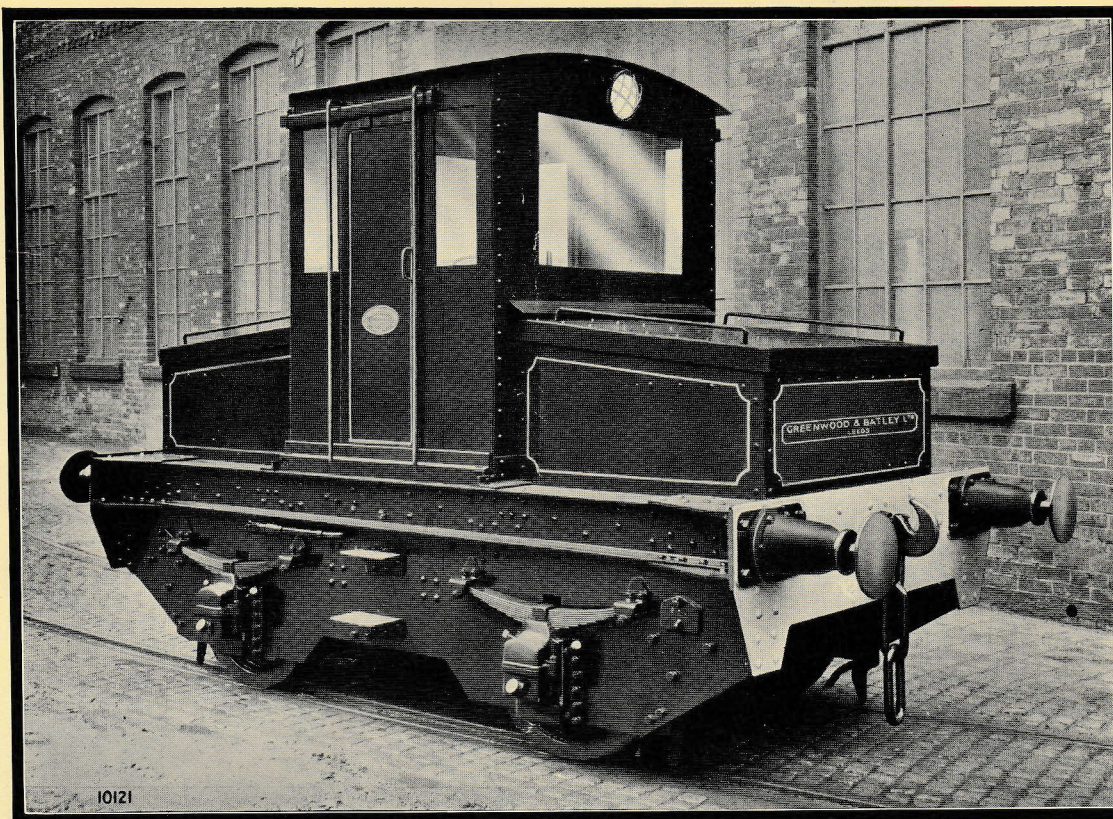


**"GREENBAT" COLLECTOR TYPE MINING
LOCOMOTIVE. WEIGHT 5 TONS.
DRAWBAR PULL 2,000 LBS.**

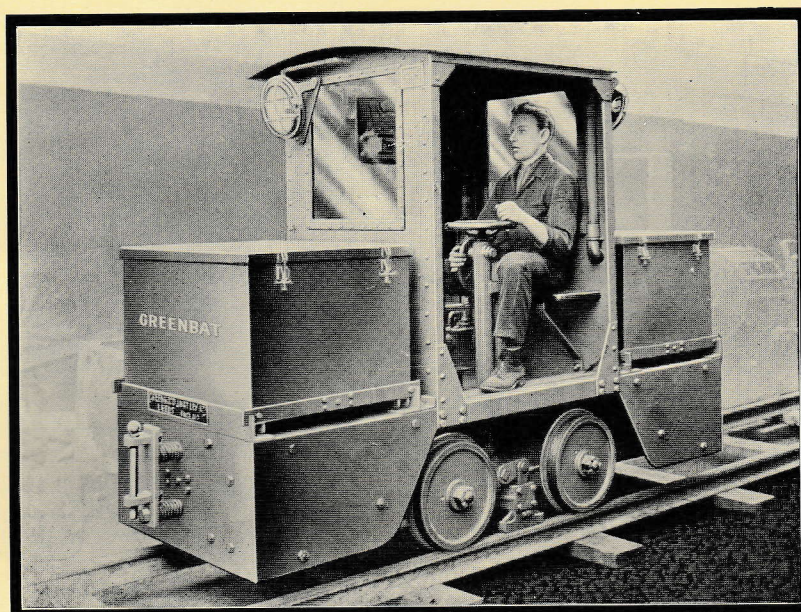
This type of locomotive is very popular for heavy duties in large mines, and the illustration shows one of a batch of 32 similar "Greenbat" Locomotives supplied to a modern and progressive Asiatic mine. Features of this locomotive worthy of note are the ample accommodation in the cab and the unlimited field of vision.

**"GREENBAT" LOCOMOTIVES WILL CUT YOUR
HAULAGE COSTS BY KEEPING YOUR TUBS
MOVING QUICKLY**

GREENWOOD & BATLEY LTD

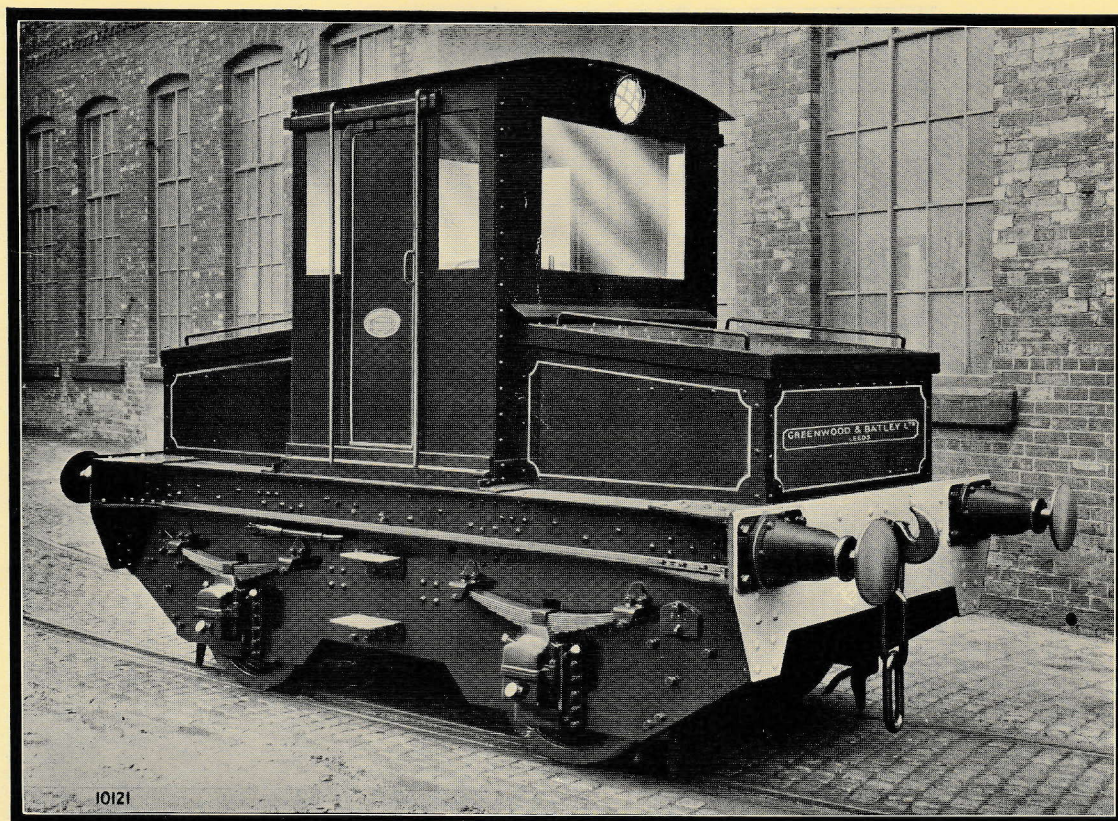


"Greenbat" full gauge shunting locomotive as supplied to the Central Electricity Board for dealing with Coal Wagons at one of the Selected Stations under the Grid Scheme.

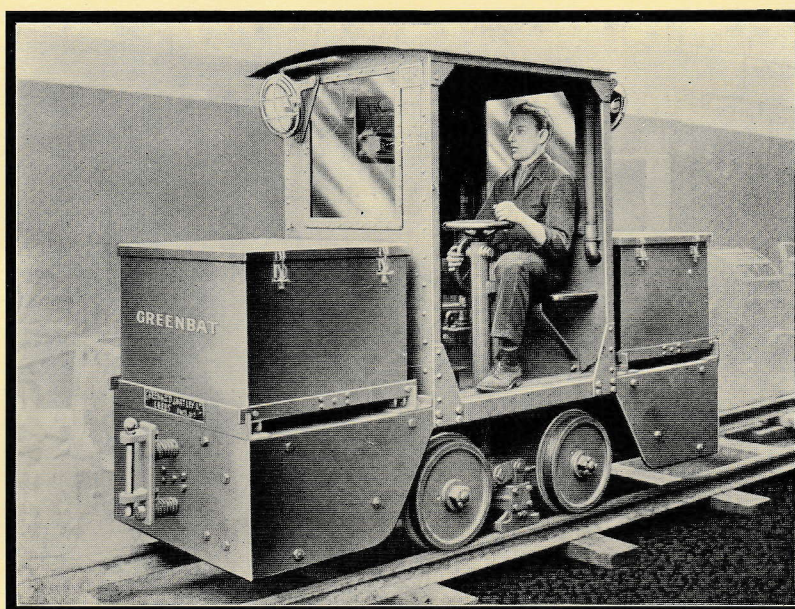


"Greenbat" light duty narrow gauge flame-proof locomotive. One of several supplied for working in Government explosives factories.

ALBION WORKS LEEDS



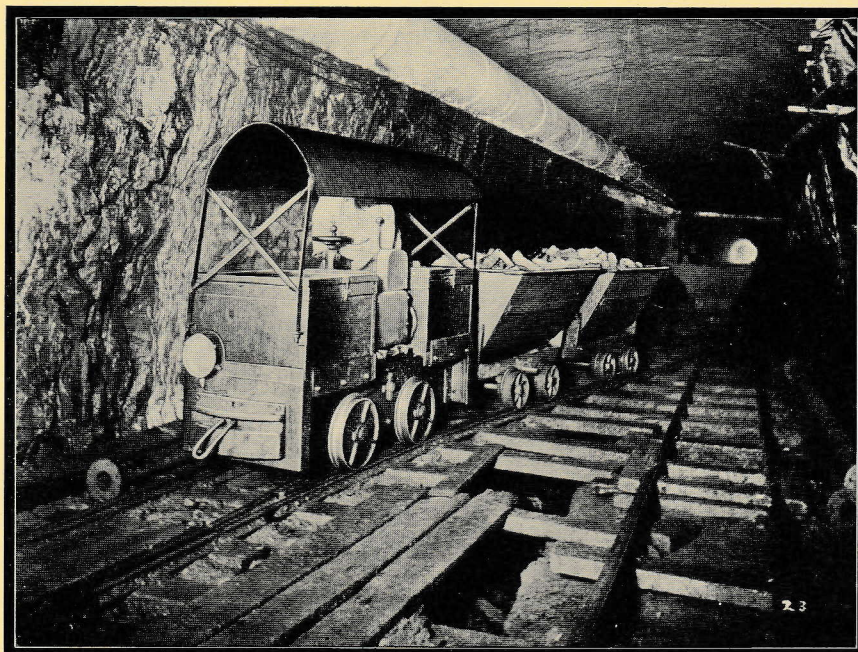
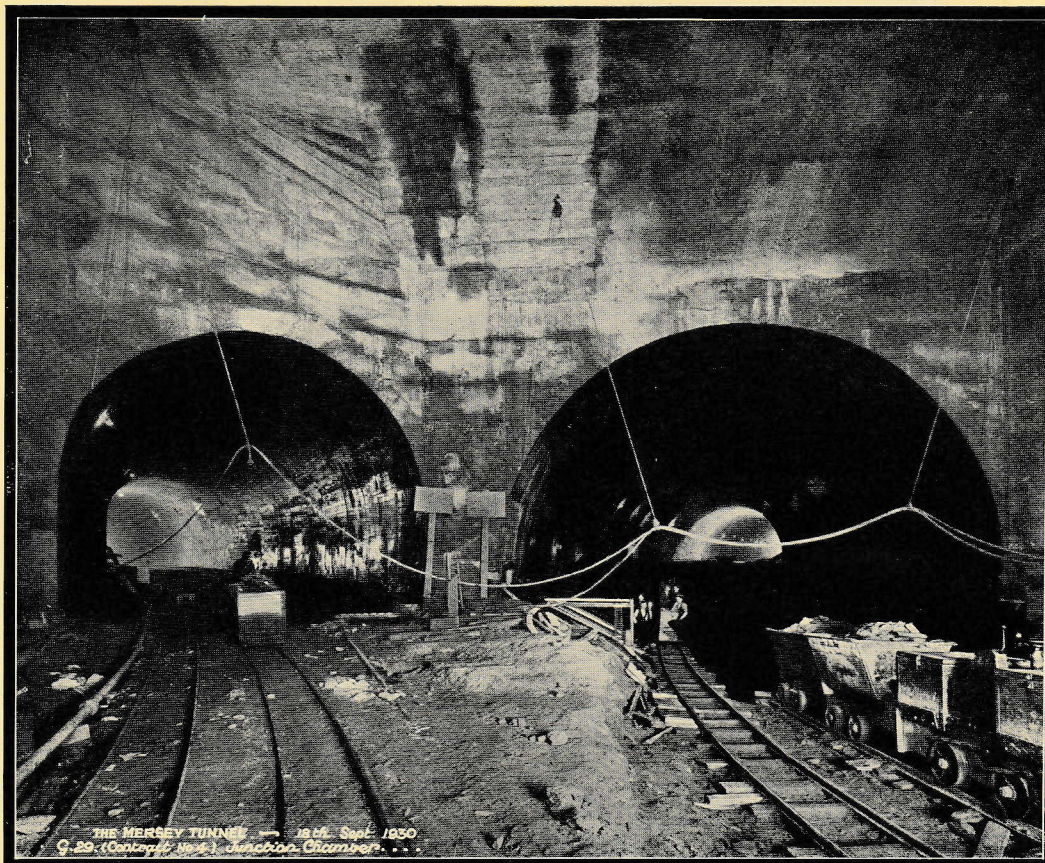
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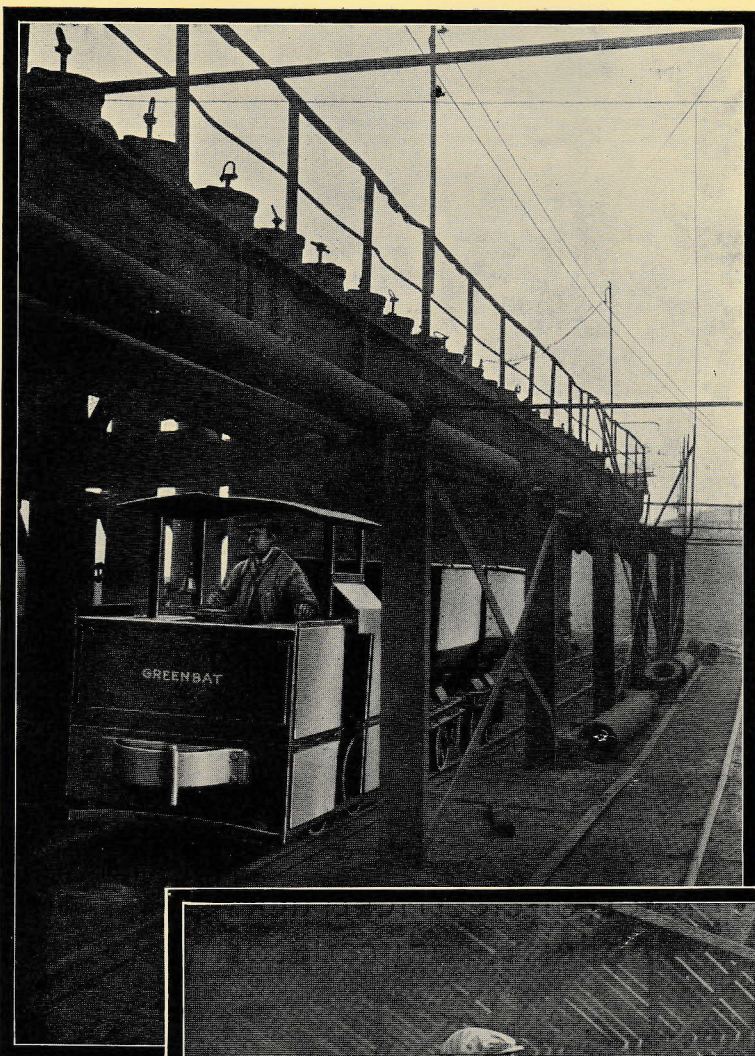
The Illustrations show "Greenbat" Locomotives at work in Britain's largest tunnel under the River Mersey



"GREENBAT" NARROW GAUGE CONTRACTORS' LOCOMOTIVES.

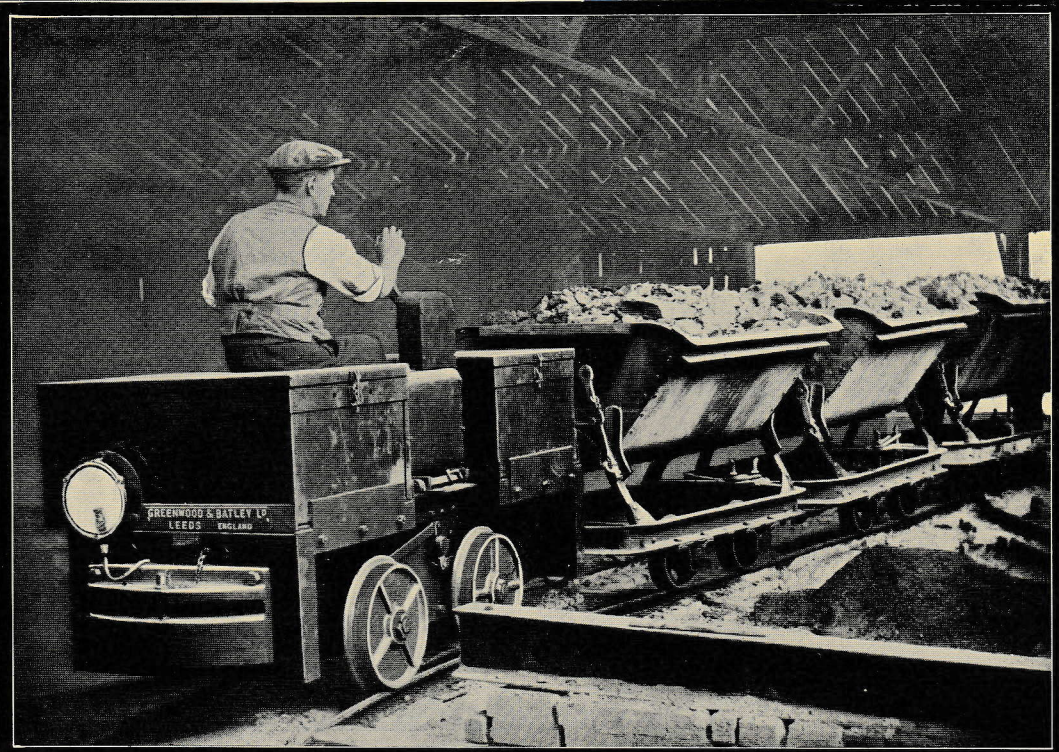
Thirty-Two of these locomotives were used and the lower illustration shows a locomotive at work in the early stages of the contract hauling a net load of 10 tons up a gradient of 1 in 30 on an exceedingly bad track with a canopy to protect the driver from dripping water. In the upper illustration the locomotives are shown] at work on the last stages of the contract.

GREENWOOD & BATLEY LTD



"Greenbat" Industrial Locomotive feeding a battery of coke ovens. The locomotive and battery compartments are specially insulated against heat.

"Greenbat" Locomotive working on the top of brick kilns hauling clay to the mills. It is also used for taking coal on to the kiln tops.



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OTHER "GREENBAT" ELECTRIC VEHICLES

Greenwood & Batley Ltd. have for many years standardised a range of Battery Trucks for the transport of goods in workshops and for inter-works service.

Full lists of these "Greenbat" Battery Trucks are available upon request.

In addition to these trucks there is also a range of Petrol and Petrol-electric trucks and special models produced to meet specific needs.

**THERE'S A "GREENBAT"
DIESEL LOCO
FOR SURFACE WORK**

**GREENWOOD & BATLEY LTD
ALBION WORKS LEEDS**

TELEPHONE : 20011 LEEDS.

TELEGRAMS : "GREENWOOD, LEEDS."

“GREENBAT” ELECTRIC LOCOMOTIVES

PRELIMINARY INFORMATION REQUIRED FOR QUOTATIONS

NAME:

POSTAL ADDRESS:

LOCO Limiting dimensions of locomotive
 Minimum radius of curves
 Gauge of track
 Is sanding gear required?
 Weight of rails

TUBS Tare weight of tubs
 Capacity of tubs
 Tractive resistance of tubs
 Type of bearing of tubs
 Type and height of draw gear

DUTY Load to be hauled per tip
 Length of journey
 Number of journeys per hour
 Length and degree of gradients
 Are gradients with or against the load?

BATTERY TYPE LOCOMOTIVES

Are charging facilities available?
 Voltage and type of supply
 Number of batteries to be charged at once
 Are interchangeable batteries required?
 Are Batteries to be lifted or rolled off?
 Time available for battery charging

TROLLEY TYPE LOCOMOTIVES

Voltage and type of supply
 Is conductor single or double?
 Height of conductor from rail level

A dimensioned drawing of the road giving the distance and gradients is desirable.
 The information requested above should be given as fully as possible.

PLEASE DETACH AND SEND WITH YOUR ENQUIRY.

PLEASE SEND IN THIS QUESTIONNAIRE

Even if the purchase of Locomotives is not actually in immediate view, the receipt by us of this questionnaire duly filled in will ensure your receiving our further publications and will enable us to submit to you an approximate price which can be filed for future reference if you so desire it.

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