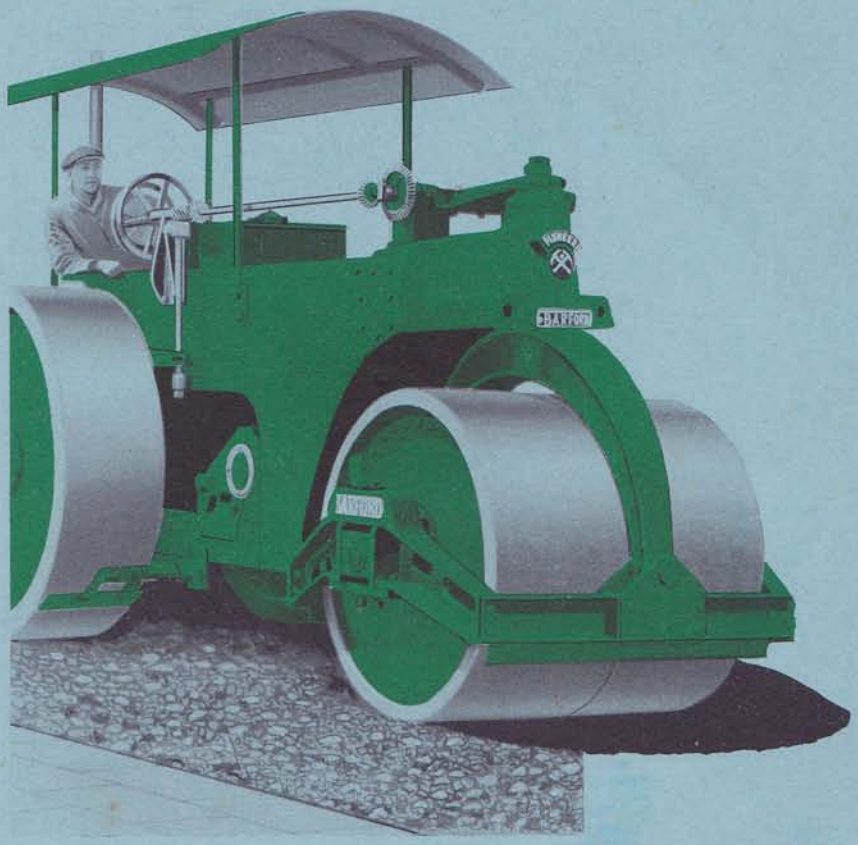
BARFORD



DIESEL ROLLERS

6 TO 16 TONS

AVELING-BARFORD LTD *Engineers* GRANTHAM *England*

BARFORD

DIESEL ROLLERS

"MD" AND "SD" SERIES

IN WEIGHTS

FROM 6—16 TONS

PIONEER

AVELING-BARFORD, LTD.

ENGINEERS **GRANTHAM** ENGLAND

TELEGRAMS—"INVICTA GRANTHAM" **TELEPHONE—GRANTHAM 441 (3 lines)**

Codes—A.B.C. 4th and 5th Editions. Bentley's complete phrase and 2nd phrase

Printed in England.

W.S.COWELL LTD IPSWICH & LONDON.

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FOREWORD

IN 1904 we produced the first internal combustion engined Roller ; this was followed in 1918 by a Motor Roller specially designed for footpath construction, and in 1927 we commenced a new era in Road Roller manufacture by building the first Roller equipped with a high-speed Diesel engine.

Since that epoch making event, we have, as leading makers of Rollers, maintained our leadership by a series of outstanding contributions to the improvement of the Road Roller, and our designs have set the World's standards.

In this catalogue we describe our range of Rollers equipped with High Speed Vertical Diesel Engines. These Rollers embody in their construction unique features which are the result of over 37 years' experience in the manufacture and operation of internal combustion engined Rollers.

Rollers are our principal manufacture, and our output is greater than that of all other British manufacturers combined ; 80 per cent. of the Rollers in use in this country to-day were made by us.

Our new Works at Grantham are the largest of their kind in the World, and are equipped with special machinery of the latest type for our particular production purposes.

"BARFORD" DIESEL ROLLERS are renowned throughout the World for their high-class performance on all kinds of road construction, their excellence of design and robust construction which enables them to render years of service under the most severe conditions with the minimum of skilled attention and upkeep costs.

The power unit is a multi-cylinder, high speed, vertical Diesel engine which, at normal R.P.M., develops ample power for the Roller to perform the heaviest duties encountered in road construction, including road-making on any gradient where it is practicable to build roads.

All working parts of the engine are enclosed for thorough protection against dust and dirt, but are easily accessible for inspection.

The engine is extremely simple to handle and will start from cold on its normal fuel without the use of heater plugs or starting cartridges.

For the four-cylinder type engine (fitted to the larger Rollers) an auxiliary engine is used for starting. Extreme accuracy of governing is provided for, and the supply of fuel to the injectors is varied exactly, according to the load on the engine, thereby ensuring a most economical consumption on fluctuating loads.

A sturdy, precision built, three-speed, oil bath type gearbox of our own design and manufacture is fitted, and this, in conjunction with the variable speed engine, forms a flexible driving combination capable of providing all necessary speeds for rolling and travelling.

The engine, transmission and gearbox are carried as a complete assembly on a sub-frame constructed of straight steel channels. Apart from the advantage of accessibility, this construction gives an extremely low centre of gravity to the machine.

An outstanding feature of the "Barford" Diesel Roller is the simplicity of control. Smooth and instantaneous reverse is obtained through two independently operated clutches controlled by a single hand-lever, and change of direction is effected by

moving the lever in the desired direction of travel—gear changing to reverse is eliminated. Steering is light, positive and irreversible, and when power steerage is fitted, steering resolves into the moving of a hand-lever to the right or left, according to the direction it is desired the Roller to turn.

Two powerful brakes are fitted ; one foot controlled and the other hand operated.

Differential gear is fitted as standard equipment.

Large diameter rolls of massive construction are fitted. A generous overlap of front over rear rolls is allowed.

The roller chain drive employed on "Barford" Diesel Rollers accounts, in part, for the smooth rolling action of Roller. Chain drive is positive and ensures smooth torque ; it needs very little attention, is quiet running, durable and trouble-free.

All wearing parts of the Roller, particularly the gears, are designed on generous lines, enabling them to stand up to the heavy loads imposed on them for many years without risk of fracture or undue wear.

Materials used in the construction of "Barford" Diesel Roller are specially selected for the particular duty they have to perform, and those parts of the machine subject to severe stresses are constructed of high quality steel.

From beginning to end, the manufacture of "Barford" Rollers is in the hands of skilled workers with long experience in Road Roller engineering, and every part is inspected before assembly in the Roller.

"Barford" Rollers are built to last and to give regular and economical service with high-class performance, and with a minimum of maintenance costs.

BARFORD ROLLERS ARE BRITISH THROUGHOUT.

Constructional features that ensure high-class performance and years of dependable service :

Design and construction backed by over 37 years of Motor Roller experience.

Multi-cylinder Vertical Diesel Engine of ample power.

Sturdy, precision built, totally enclosed oil-bath gearbox, with heat treated machine-cut gears of special steel.

Engine and transmission carried on patent sub-frame, making for accessibility and low centre of gravity.

Instantaneous and smooth reverse—without gear shifting—by means of two large diameter clutches with single lever control.

Great strength and rigidity secured by unique design of frame and sub-frame.

Spring mounted underslung forecarriage, and spring mounted rear axle.

Large diameter rolls with generous overlap.

Taper roller bearing in steering head.

Positive irreversible steering—power steering if required.

Differential gear—standard equipment.

Convenient grouping of all controls.

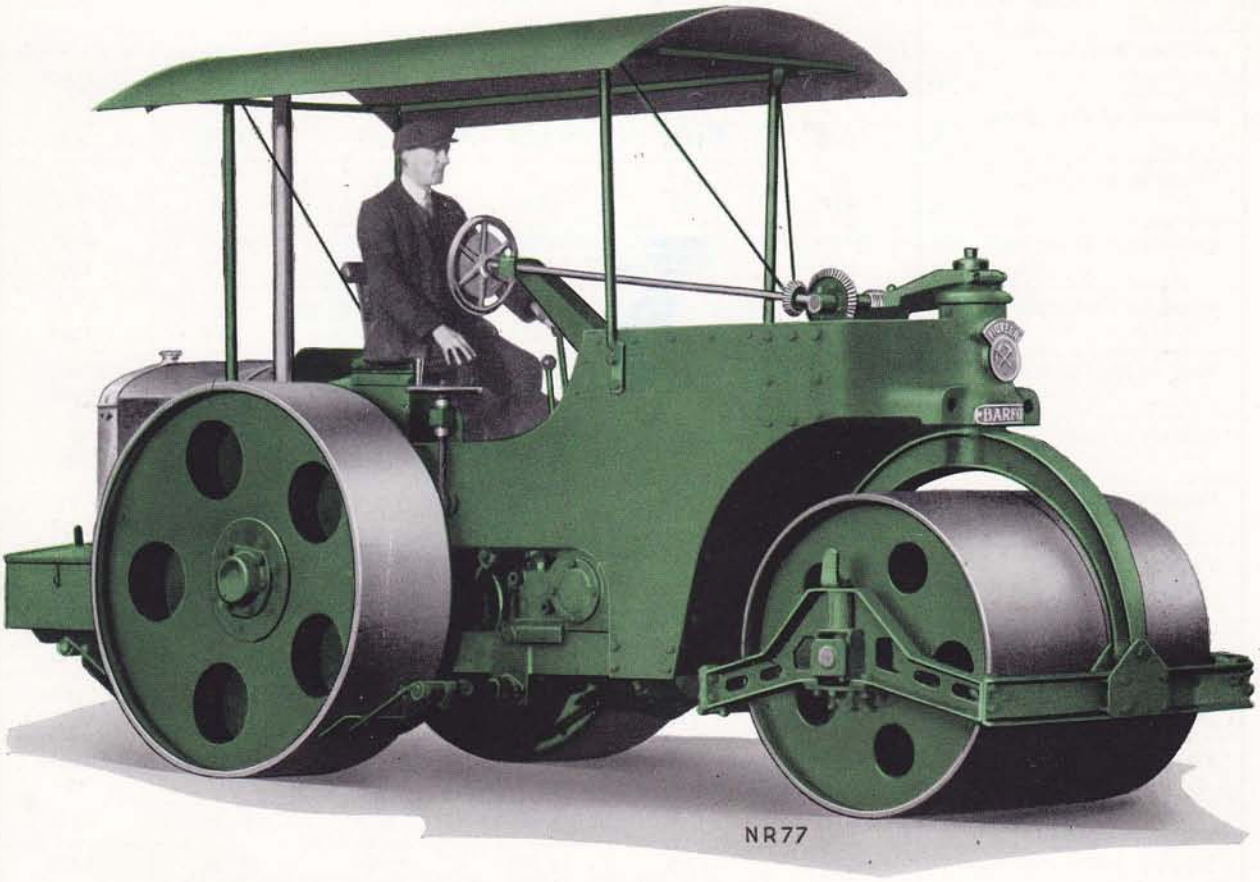
British material and British workmanship throughout.

General Dimensions, Weights, etc.

TYPE : CODE WORD :	MD6 KYCAB	MD8 KYDER	SD9 FERAN	SD10 FESOL	SD12 FEQAM	SD14 FELIP
Nominal Weight	6 tons 18 cwts.	8 tons 14 cwts.	9 tons 10 cwts.	10 tons 10 cwts.	12 tons 3 cwts.	14 tons 3 cwts.
kg.	7010	8839	9652	10668	12345	14377
Diameter of Rear Rolls ...	4′ 9″	4′ 9″	5′ 0″	5′ 0″	5′ 6″	5′ 6″
mm.	1448	1448	1524	1524	1676	1676
Width of Rear Rolls... ...	18″	18″	18″	18″	20″	20″
mm.	457	457	457	457	508	508
Diameter of Front Roll ...	3′ 6″	3′ 6″	3′ 10″	3′ 10″	4′ 0″	4′ 0″
mm.	1066	1066	1168	1168	1219	1219
Width of Front Roll... ...	3′ 11½″	3′ 11½″	4′ 2″	4′ 2″	4′ 2″	4′ 2″
mm.	1206	1206	1269	1269	1269	1269
Total Rolling Width	6′ 4″	6′ 4″	6′ 6¾″	6′ 6¾″	6′ 10¾″	6′ 10¾″
mm.	1931	1931	2000	2000	2102	2102
Overlap of Rolls (each side)	4″	4″	4″	4″	4″	4″
mm.	101	101	101	101	101	101
Wheel Base	8′ 10½″	8′ 10½″	9′ 7½″	9′ 7½″	9′ 7½″	9′ 7½″
mm.	2705	2705	2934	2934	2934	2934
Turning Circle	30′ 0″	30′ 0″	33′ 0″	33′ 0″	33′ 4″	33′ 4″
mm.	9144	9144	10058	10058	10160	10160
Overall Length	16′ 10″	16′ 10″	18′ 9″	18′ 9″	18′ 9″	18′ 9″
mm.	5131	5131	5715	5715	5715	5715
Fuel Tank Capacity	25 galls.	25 galls.	30 galls.	30 galls.	30 galls.	30 galls.
Litres	113	113	136	136	136	136
Water Tank Capacity ...	60 galls.	60 galls.	100 galls.	100 galls.	100 galls.	100 galls.
Litres	272	272	454	454	454	454
Engine : B.H.P.	25/27½	25/27½	33/36	33/36	33/36	33/36
Engine : R.P.M. (Normal) ...	1,100	1,100	1,100	1,100	1,100	1,100
Roller Speeds. M.P.H. ...	3·78 2·52 1·16	3·78 2·52 1·16	3·91 2·35 1·3	3·91 2·35 1·3	3·71 2·22 1·23	3·71 2·22 1·23
Roller Speeds. Kilometres per hour	6·07 4·05 1·86	6·07 4·05 1·86	6·30 3·78 2·10	6·30 3·78 2·10	5·96 3·57 1·97	5·96 3·57 1·97
Nominal Weight with Water Ballasted Rolls (Filled) ...	8 tons 9 cwts.	—	10 tons 18 cwts.	11 tons 18 cwts.	13 tons 16 cwts.	15 tons 13 cwts.
kg.	8585	—	11074	12090	14022	15901

Note : Nominal weights are less all extras except Awning and Sprinkling Tank (empty).

Whilst every care has been taken to ensure accuracy of the weights, dimensions, and other particulars of the Rollers illustrated and specified in this Catalogue, they are not binding in detail, and we reserve the right to modify.



Type " MD6 " BARFORD Diesel Roller

GENERAL SPECIFICATION

ENGINE

A vertical, high-speed, four-stroke Diesel Oil Engine of ample power is fitted to "Barford" "MD" and "SD" Series Rollers—the former being equipped with a three-cylinder, 25/27½ B.H.P., the latter with a four-cylinder 33/36 B.H.P. engine.

The engine is governed to run at 1,100 R.P.M., but has remarkable flexibility and will run indefinitely at all speeds from 350 R.P.M. to 1,100 R.P.M. with complete combustion of fuel. The fuel is supplied to each cylinder by a separate injection fuel pump and sprayer ; the governor controlling the amount of fuel delivered at each stroke of the pump. This system of fuel injection not only ensures complete combustion of the fuel, but also ensures economic and clean-running of the engine at all loads.

The engine speed is varied by a hand control lever working through the governor, which increases or decreases the amount of fuel delivered to the cylinders.

A patented system of power starting, employing a 298 c.c. water-cooled, petrol engine, is provided for the 33/36 B.H.P. engine fitted to the "SD" Series Rollers. The main engine crankshaft is rotated by a friction pulley driven by the auxiliary engine, the pulley being brought into contact with the flywheel by means of a lever. By this means the engine can be started from cold in a very short space of time. In the case of the engine fitted to the "MD" Series Rollers, power starting is unnecessary, as it can be started by hand in the usual manner.

Lubrication to all important parts is by a pressure pump located in the engine sump. Oil is delivered through a manifold to each main bearing and thence through oilways in the crankshaft to the big end bearings. An oil filter is incorporated in the pump, and a pressure gauge, mounted on the dash board, is provided.

Effective engine cooling is provided by water circulated on the thermo-syphon system, assisted by a centrifugal pump. A large capacity radiator and a cooling fan are fitted. A thermostatic control maintains the cooling water at a pre-determined temperature.

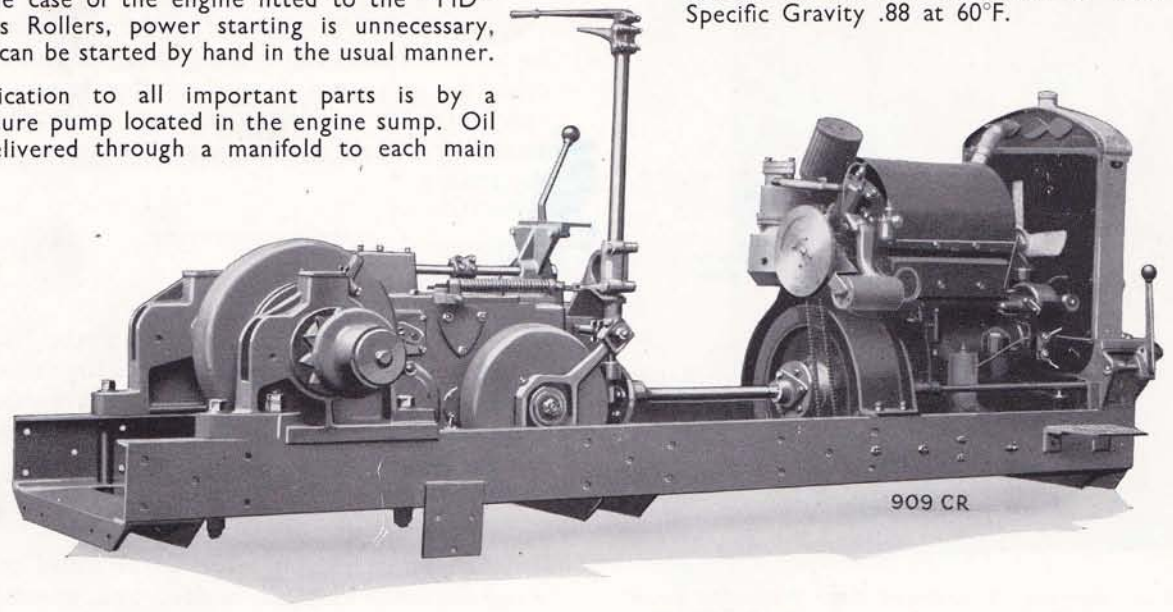
The mechanism of the engine is effectively protected against dirt and dust ; a removable cover affords complete protection for the sprayers, pumps, etc.

An efficient air-filter of the felt-element type is fitted, and this effectively excludes dust from the cylinders and also acts as an intake silencer.

The engine will run efficiently and economically on Distillate Fuel Oils ; the following have been used with satisfaction :

Shell Diesoline	Light Diesoleum
Shell Gas Oil	Pratts' Diesel Fuel "A"
Texaco 811 Diesel Gas Oil	Anglo American Grade "A"

or similar grades, the viscosity of which does not exceed 50 seconds Redwood at 100°F., or Specific Gravity .88 at 60°F.



Patent Sub-Frame Assembly, showing Engine and Transmission.

TRANSMISSION

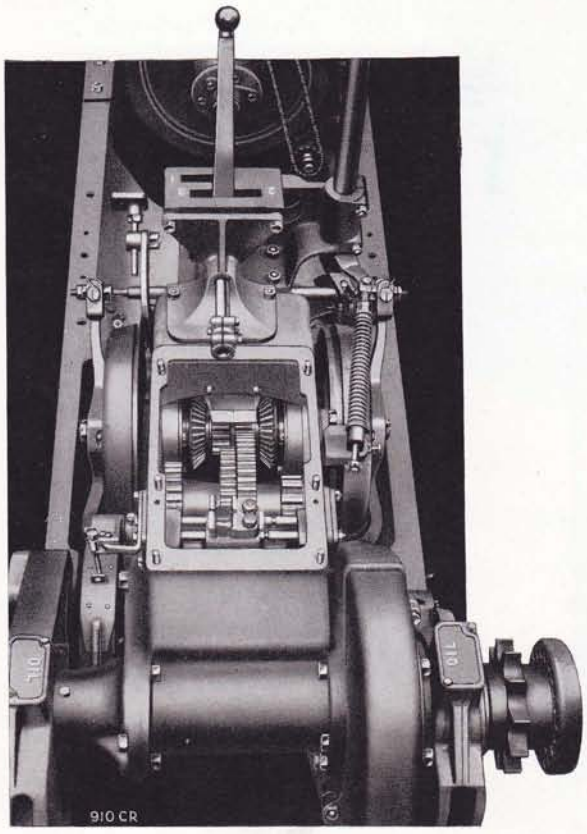
(PATENT)

GEAR BOX

A massive three-speed gear box of our own design and manufacture is fitted. As the box is of the totally enclosed type and forms an oil bath for the gears, perfect lubrication is assured.

All gears are made from heat treated steel blanks and have machine-cut teeth, ensuring smooth and quiet running. The shafts are mounted in ball or roller bearings, and are splined to take the gear wheels.

Access to the gears is made easy by the provision of a large cover plate.



View showing Three-Speed Gear Box with cover removed, Change Speed Lever, Foot Brake, Clutches and operating gear, and Final Drive Pinion.

Speed changes are effected by sliding gears operated by a control lever working in a change speed gate ; the gears not in use being definitely locked out of engagement.

Through the medium of two independent clutches, equal speeds are obtained in both forward and backward directions of travel without disengagement of the gear in use.

Engine power is transmitted to the gear box by a propeller shaft fitted with two disc type flexible couplings.

CLUTCHES

Two clutches, one for forward and one for backward travel are incorporated in the gearbox assembly. They are of the simple cone type, lined with fabric. In operation they give smooth and instantaneous reverse to the Roller. A single hand lever, acting through a spring loading device, operates each clutch independently.

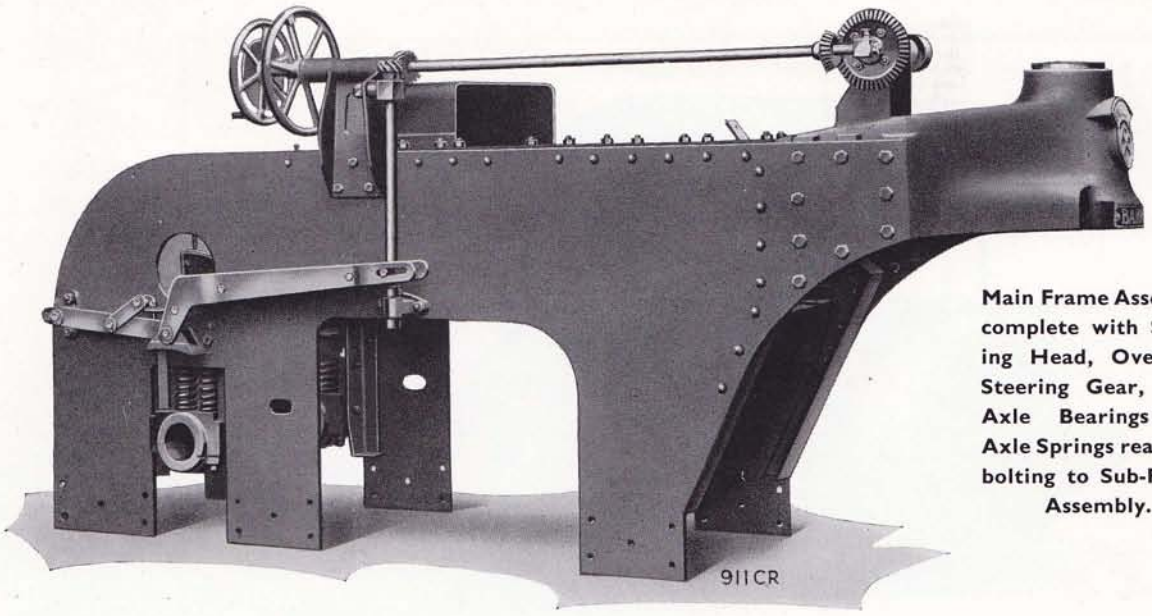
FINAL DRIVE

The drive from the gear box to the main axle is by hardened steel roller chain having a breaking strain far in excess of any load that it may be called upon to transmit. The chain is well protected by a steel guard ; provision is made for adjustment.

SUB-FRAME

The patent sub-frame construction of the "Barford" Diesel Rollers is responsible to a large extent for the low centre of gravity of the Roller. Furthermore, the transmission, engine and radiator being mounted on the sub-frame, can readily be removed from the Roller as a unit without dismantling the whole machine.

The sub-frame itself is made up of rolled steel channels, with electrically welded cross members, forming an assembly of great strength and rigidity.



Main Frame Assembly complete with Steering Head, Overhead Steering Gear, Main Axle Bearings and Axle Springs ready for bolting to Sub-Frame Assembly.

MAIN FRAME

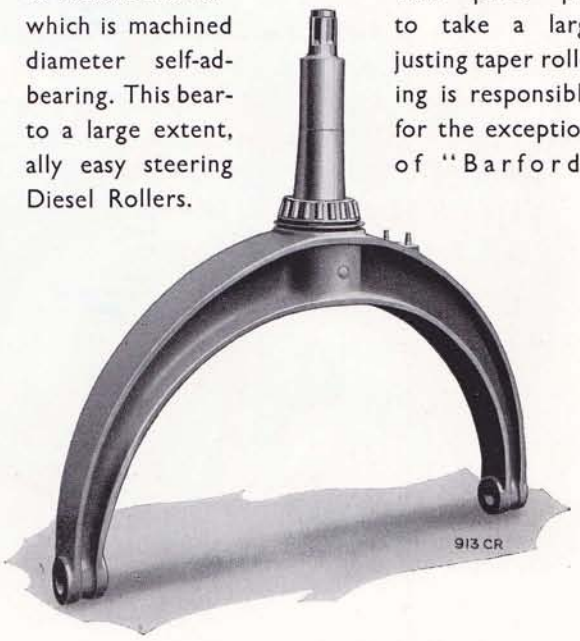
The design of the main frame is such, that with the side plates of steel secured to the sub-frame at the bottom, and to the tanks and head at the top, a deep box section member of great strength and absolute rigidity is formed.

SPRING MOUNTED FORECARRIAGE

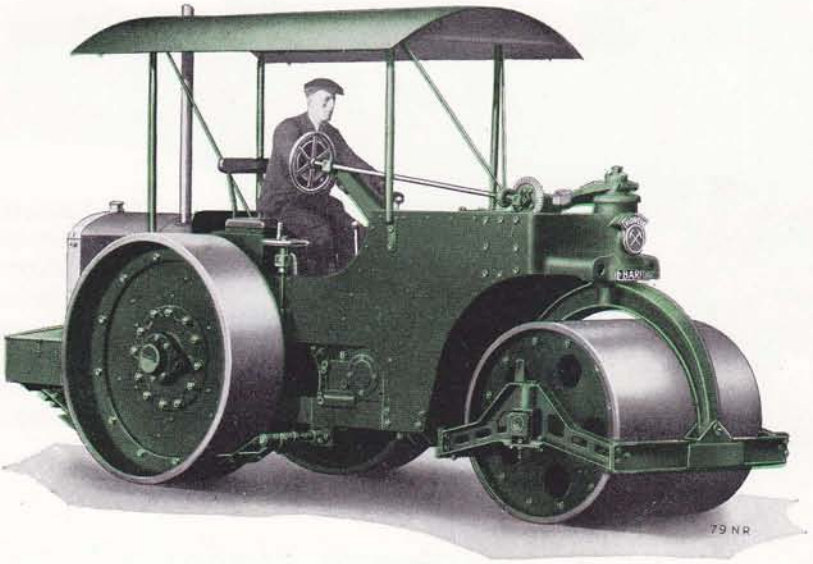
An underslung spring-mounted forecarriage of improved design is fitted. The forecarriage is secured to the steering fork on its longitudinal centres by pivot pins. This arrangement not only ensures that the front roll pressure is constant over the full width of the roll under all normal working conditions, but allows for full steering lock when travelling over uneven ground without undue exertion on the part of the driver. Further, the springs absorb shocks which would, otherwise, be transmitted to the machine when travelling over rough surfaces.

STEERING FORK

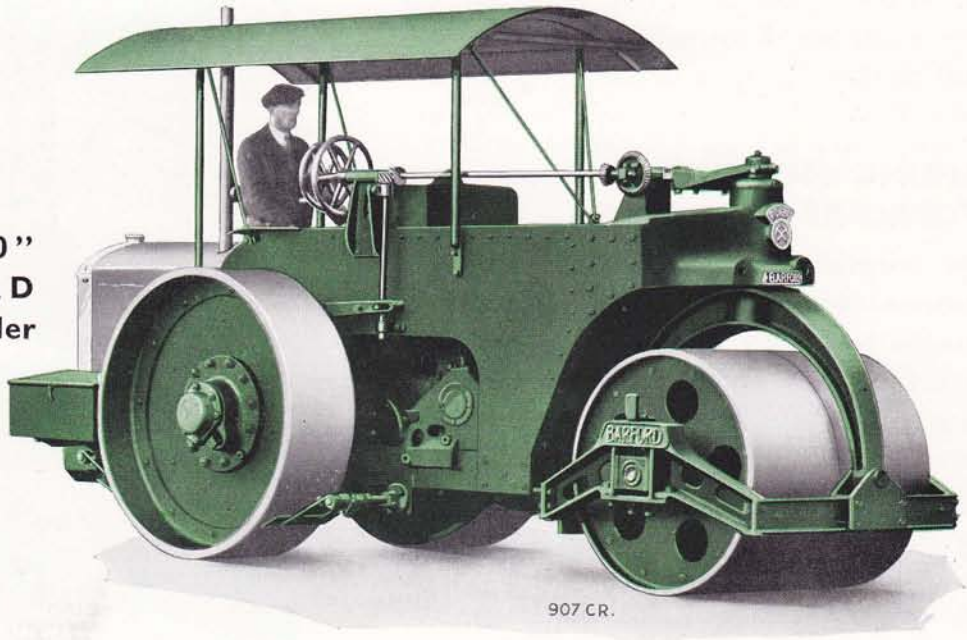
Simplicity of design and great strength are combined in the construction of the steering fork, which is of cast steel. The top of the fork is bored to receive the vertical pivot pin, which is machined to take a large diameter self-adjusting taper roller bearing. This bearing is responsible, to a large extent, for the exceptionally easy steering of "Barford" Diesel Rollers.



BARFORD DIESEL ROLLERS



Type " MD8 "
BARFORD
Diesel Roller



Type " SD10 "
BARFORD
Diesel Roller

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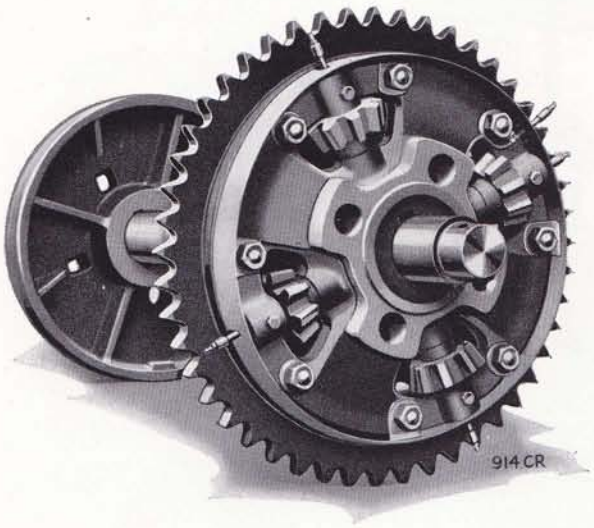
DIFFERENTIAL GEAR

The "MD" Series Rollers are fitted with three-pinion, and the "SD" Series Rollers with four-pinion differential gear as standard equipment. The gear is carried on the rear axle in combination with the final drive chain wheel.



The provision of differential gear enables the Roller to negotiate acute corners without imposing severe stresses on the axle ; facilitates steering, prevents damage to the road surface when manoeuvring, and reduces wear on the rolls by eliminating wheel spin when cornering. Pinions and gear wheel are cast in special steel.

A differential locking pin is provided.

BRAKES

Two powerful brakes of the contracting band type, with renewable linings, are fitted to all "Barford" Diesel Rollers.

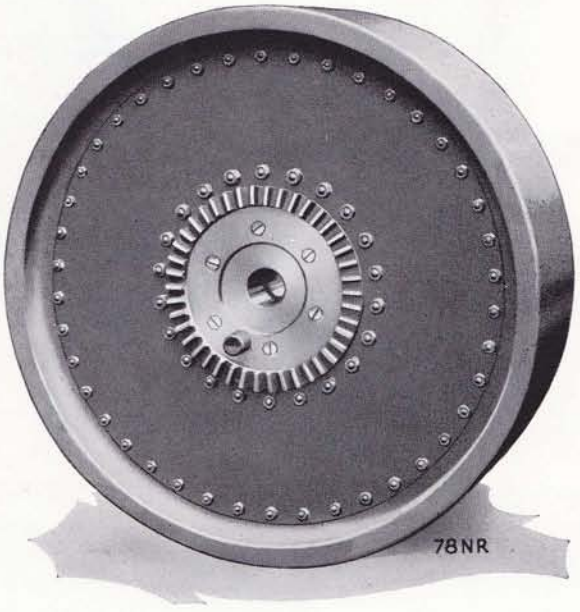
The main brake is foot operated and acts on a drum secured to the intermediate shaft, the latter being extended to the outside of the gearbox.

For emergency use, and for holding the Roller stationary on a hill, a wheel and screw controlled hand brake, acting on a drum keyed to the main axle, is provided. Provision is made for adjustment to compensate for wear of the brake linings.

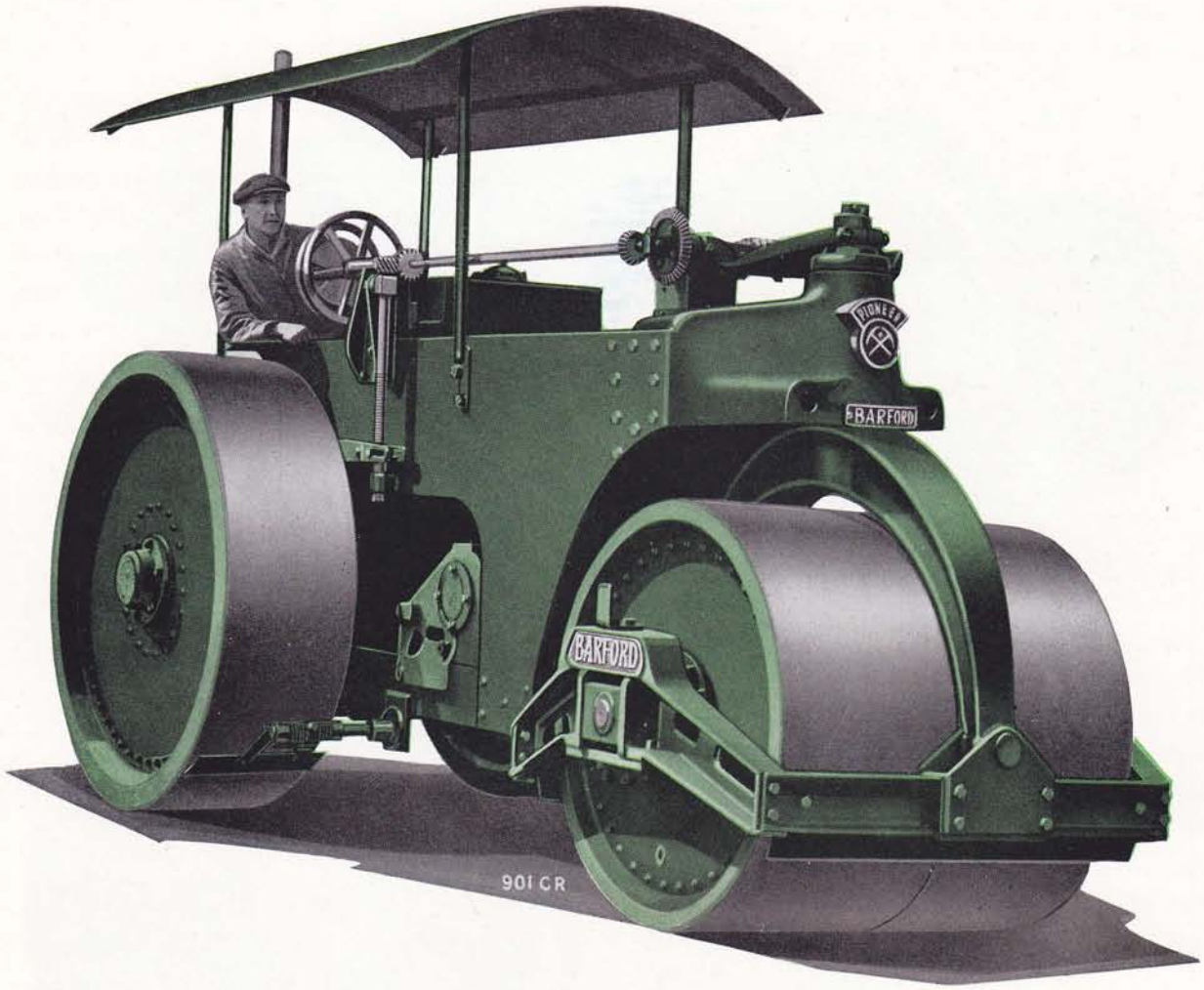
ROLLS

Non-water ballast type rolls are fitted as standard, but water-ballast rolls can be fitted at extra charges. (See under Extras). The "SD9" and "MD6" Type Rollers are equipped with rolls constructed of steel plate, the hubs being of cast iron, with renewable bushes. On all other sizes, the rims are of special hard wearing cast iron.

A generous overlap of front over rear rolls is allowed.



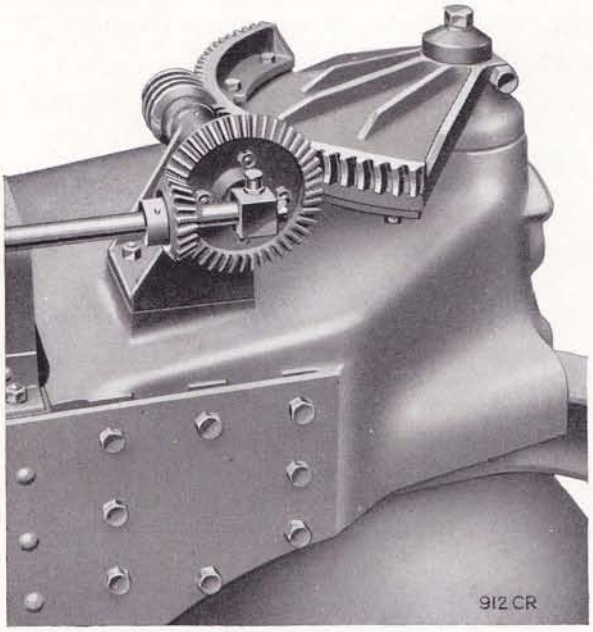
Rear Roll, showing Differential Wheel.



Type "SD14" BARFORD Diesel Roller equipped with Water Ballast Type Rolls

STEERING

Directional control is by overhead shaft and hand-wheel, operating the front roll through the medium of bevel gears, worm wheel and segment ; the latter being splined to the vertical pivot pin.



Close-up view of Steering Head Mechanism.

AXLES

The axles, of special quality, oil toughened steel, run in bearings of generous proportions.

The driving centre and brake drum are secured to the rear axle by sunk keys. The front axle is so arranged that it can readily be removed from the forecarriage.

REAR SPRINGS

Substantial spiral springs are fitted above the rear axle bearings. These, in conjunction with the forecarriage springs, effectively damp out road shocks and permit a high travelling speed over rough surfaces.

SCRAPERS

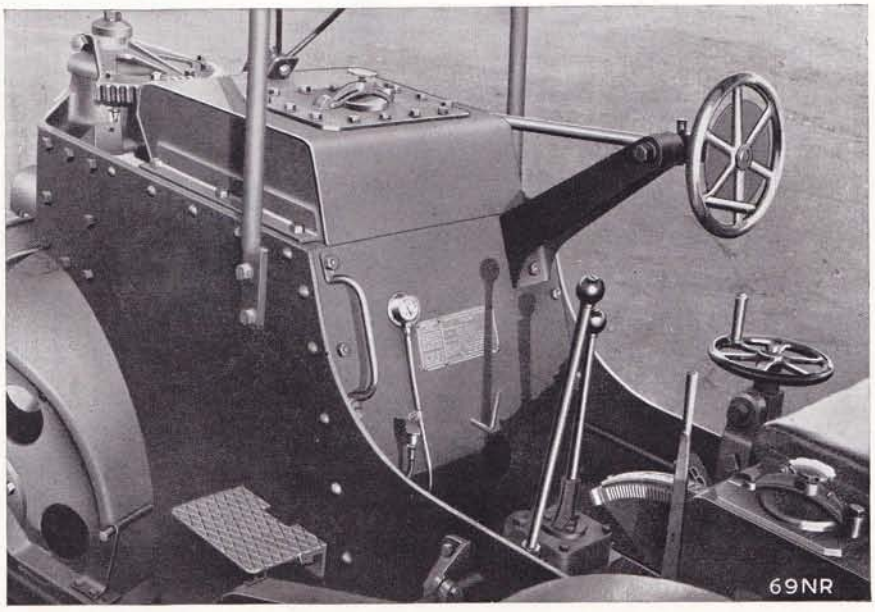
The front roll is provided, both at the back and front, with full width adjustable scrapers. Adjustable spring loaded scrapers are fitted to the front and back of the rear rolls. The scraper plates are renewable.

FUEL TANK

A strongly constructed fuel tank holding sufficient fuel for approximately ten working days is provided.

CONTROLS

All controls being conveniently grouped within easy reach of the driver, ease of handling is assured.



Arrangement of Controls on "MD" Series Rollers

DRAW BAR

A spring loaded draw bar of steel plate construction is supplied in the standard equipment of the Roller.

BONNET

A hinged bonnet of sheet steel completely covers the engine.

LUBRICATION OF ROLLER

Lubrication to important parts, such as front and rear axle bearings, steering fork, steering head, differential gear, fan, etc., is by grease gun.

OUTFIT

A set of tools is provided, including spanners, oil can, grease gun, spare nipples, and small wearing parts. These are housed in a tool box, alongside the engine bonnet. A waterproof cover for the Roller is supplied.

TEST

The engine undergoes a thorough bench test before assembly in the Roller, and the complete Roller is tested on the road for at least two days.

EXTRA FITTINGS

The following extra equipment can be supplied when required :

AWNING

Of sheet metal, extending practically the whole length of the Roller, affording complete protection for the driver. Side and end curtains are included in lieu of standard waterproof cover when awning is fitted.

WATER TANK AND SPRINKLERS

Sprinklers are arranged so that the rolls can be sprayed simultaneously or separately. For capacity of tanks, see table of dimensions, page 7.

HAND PUMP AND HOSE

Semi-rotary type pump, complete with wire armoured suction and delivery hose, foot valve, strainer, and carrying bracket.

POWER PUMP AND HOSE

Simple reciprocating type pump driven from transmission and arranged with dog clutch and control lever. Hose equipment as described above.

POWER PULLEY

Engine power can be utilized for driving other machinery by means of a power take-off pulley ; the power is taken from the transmission, and three pulley speeds are available.

WINDING GEAR

The winding drum is keyed to the rear axle, and is supplied complete with rope guide and rollers.

STEEL PLATED REAR ROLLS

Rollers fitted with rear rolls having cast iron rims can be fitted with renewable steel plate treads. These treads are recommended when the Roller is to work in very hilly districts, as they afford better adhesion to the road surface.

WATER BALLAST TYPE ROLLS

Water ballast type rolls are arranged so that they can be filled with water to increase the weight of the Roller.

The side plates of the rolls are of mild steel accurately machined and fitted in recesses in the rims and hubs and secured by studs and nuts.

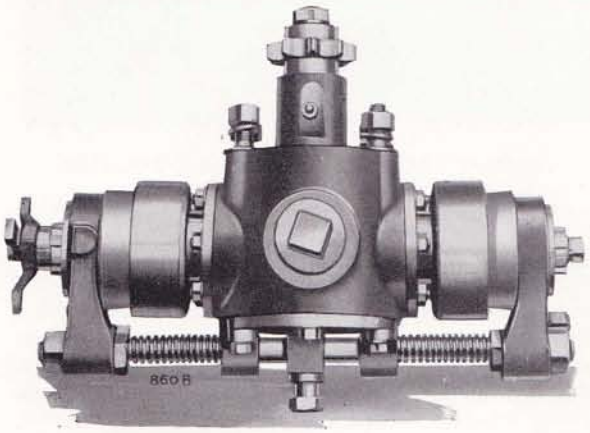
WATER BALLAST TYPE ROLLS—*contd.*

Special material is used to make the joints water-tight. The rolls are fitted with a large plug for filling and emptying.

The rims of water ballast type rolls—with the exception of the types "MD6" and "SD9" which are of steel plate—are made of special hard wearing cast iron. These can be steel plated as afore-mentioned.

POWER STEERING GEAR

This gear is capable of turning the steering roll over its full range of movement in a few seconds. Power for operating the mechanism is taken from the propeller shaft by a roller chain and chain wheel



Power Steering Unit.

to the driving shaft. This shaft carries the actuating gear, which consists of two cone type clutches, bevel wheel and pinions ; the latter are enclosed in an oil tight casing. The bevel wheel shaft carries a chain wheel from which the drive to the steering worm is taken by means of a roller chain. The clutches are brought into action by a single hand lever, a movement of which—to the right or left—brings the appropriate clutch into play, and the front rolls move in a corresponding direction.

A safety device, which automatically cuts out the drive at a pre-determined lock, is provided.

Power steering gear is absolutely independent of the hand steering gear.

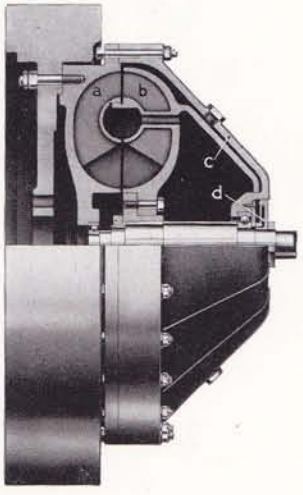
The whole drive is simple and unobtrusive, and calls for no attention apart from occasional oiling.

FLUID DRIVE COUPLING

The Fluid Traction Coupling fitted to "Barford" Diesel Rollers represents the most advanced design for the application of the internal combustion engine to machinery which is frequently started and stopped.

The construction of the Coupling is extremely simple, comprising essentially four parts :—The Impeller (*a*), mounted upon the engine crankshaft ; the Runner (*b*), mounted on the driven shaft ; the Casing (*c*), bolted to the Impeller and enclosing the Runner ; and the Gland (*d*), of the diaphragm type, retaining the oil in the casing.

In operation there is a perfectly smooth take-up of the load simply by accelerating the engine, which is thus allowed to pick up the load gradually whilst running. Starting is made much easier because the gears are not directly coupled to the engine, and only the engine and impeller of the coupling have to be rotated. In so far as actual rolling is concerned, no matter how heavy the work, whether rolling or scarifying, it is impossible to stall the engine. In addition to its value as a shock absorber, the "fluidrive" reduces wear, tear and maintenance throughout the engine and transmission.



Fluid Drive Coupling shown in section.

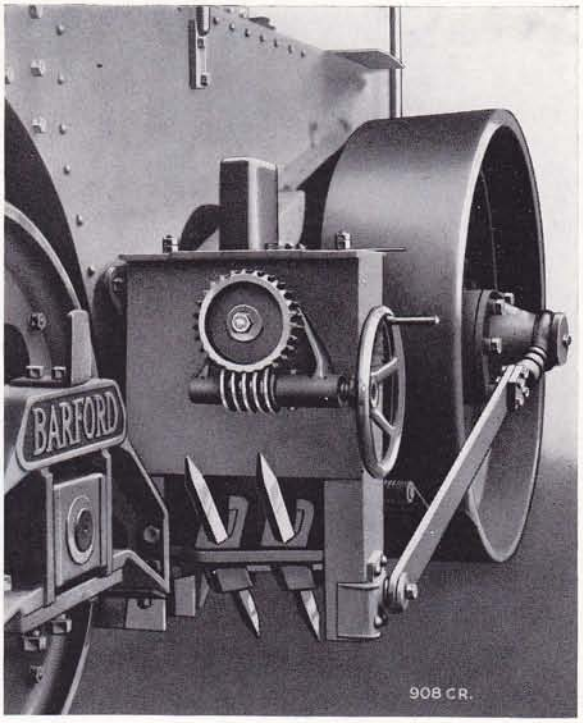
SCARIFIER

For use on "Barford" Diesel Rollers we recommend the "Price" Patent Resilient Scarifier.

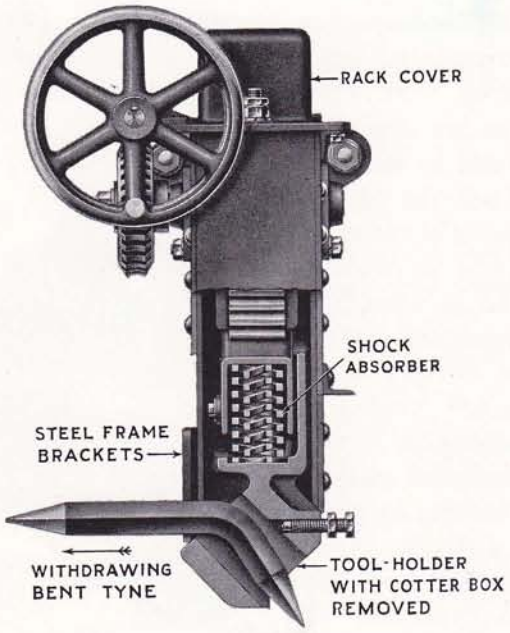
By arrangement with the Patentees we manufacture these Scarifiers for fitting to our Rollers.

The outstanding advantages of the "Price" Scarifier are :

1. Vibration reduced to a minimum.
2. Increased cutting speed produced by spring-loaded tines.
3. Increased life of tines.
4. No overloading of Roller.
5. Patent Cotter Box ensuring easy removal of bent tines.
6. Adjustable Draw-bar with fabric-lined trunnion.
7. Totally enclosed rack preventing entry of dirt.
8. Improved patent frame.
9. Patent shock absorbing device.



Barford "SD" Roller fitted with Two-Tine "PRICE" Scarifier.



Cross-Section of One-Tine Scarifier, showing method of removing bent Tine.

The frame of the "Price" Scarifier is built up of mild steel channels, with two cast steel brackets forming the top cover and carrying the worm operating gear and handwheel. The tool holder, rack and pinion gear are all of cast steel ; the rack being entirely enclosed. Cast solid with the rack is a box in which is housed the shock absorbing device.

The patented Cotter Box eliminates the difficulty usually experienced in removing bent tines. "Price" Patent Scarifiers are made in one, two and three tine sizes.

The following are the recommended sizes for "Barford" Diesel Rollers :

Type	Scarifier
"MD6"	One or two tine.
"MD8"	" " "
"SD9"	Two or three tine.
"SD10"...	" " "
"SD12"...	" " "
"SD14"...	" " "

Some Users of "Barford" Diesel Rollers

AT HOME—PUBLIC AUTHORITIES

Aberdeenshire County Council.
Argyllshire County Council (Cowal District).
Bute County Council (Arran District).
Cork County Council (4).
Denbighshire County Council.
Derbyshire County Council (Bakewell District) (2).
Dumfries-shire County Council.
Fife County Council.
Flintshire County Council.
Hertfordshire County Council (2).
Inverness-shire County Council.
Isle of Ely County Council.
Kincardineshire County Council (2).
Lanarkshire County Council (9).
Laoighis County Council.
Leitrim County Council.
Middlesex County Council.
Morayshire County Council.
Northamptonshire County Council (2).
Offaly County Council.
Ross & Cromarty County Council.
Salop County Council.
Somerset County Council (2).
Staffordshire County Council (2).
West Riding of Yorkshire County Council (2).
Westmeath County Council.
Wigtownshire County Council (4).
Accrington Corporation.
Barnsley County Borough.
Beverley Municipal Corporation.
Birkenhead Borough.
Birmingham Corporation (6).
Blackpool County Borough.
Bolton Corporation.
Brighouse Borough.
Bristol City.
Burnley County Borough.
Chelsea Borough Council.
Cheltenham Borough.
Chester City.
Chesterfield Corporation.
Conway Borough.
Crewe Borough.
Croydon Corporation (2).
Dewsbury Borough.
Dundee Corporation.
Dun Laoghaire Borough.
County Borough of Doncaster.
Dunoon Burgh.
Glasgow Corporation (2).
Grangemouth Burgh.
Huddersfield Corporation (3).
High Wycombe Borough.
Hull Corporation.
Kingston-upon-Thames Royal Borough.
Leeds City.
Lichfield City.
Loughborough Corporation.
Middlesbrough Borough.
Newcastle-under-Lyme Borough.
Newport County Borough.
Nottingham County Borough (2).
Rawtenstall Borough.
Rotherham County Borough.
Rowley Regis Borough.
City of New Sarum.
Sheffield Corporation (3).
Southport County Borough.
Stoke-on-Trent Corporation.
Sunderland County Borough.
Sutton Coldfield Borough.
Wigan Borough (2).
Felling Urban District Council.
Friern Barnet Urban District Council.
Hayes Urban District Council.
Hetton Urban District Council.
Horsforth Urban District Council.
Ilkley Urban District Council.

Some Users of "Barford" Diesel Rollers—contd.

AT HOME—PUBLIC AUTHORITIES—(contd.)

Littlehampton Urban District Council.
Loftus Urban District Council.
Maesteg Urban District Council.
Northfleet Urban District Council.
Oldbury Urban District Council.
Redditch Urban District Council.
Woking Urban District Council.
St. Thomas Rural District Council.
Birmingham Tame and Rea District Drainage Board.

AT HOME — CONTRACTORS

Boot, Henry & Sons, Ltd., Sheffield.
Johnston Bros., London.
Kavanagh, James, Dun Laoghaire.
Kings & Co., Ltd., Glasgow.
Lyell, Andrew Blair, Ltd., Birmingham.
Miller, Thos., & Sons, Dunfermline.
Monk, A., Ltd., Warrington.
Mowlem, John & Co., Ltd., London.
Paine, Manwaring & Lephard, Ltd., Worthing.
Penmaenmawr & Trinidad Lake Asphalt Co., Ltd., Liverpool.
Tarmac Ltd. (6), Wolverhampton.
Tawse, Wm., Ltd., Aberdeen.
Trentham, G. Percy, Ltd., Birmingham.
Saunders, A., Brighton.
White, J., Edinburgh.
Williams, H., Camberley.

WAR OFFICE (3)

ESTATE

Sir Bernard Greenwell, Bart., Marden Park Surrey.

ABROAD

Albania.
Argentine.
Australia.
Austria.
Belgium.
Bermuda.
Brazil.
B.W.I., Antigua.
B.W.I., Barbados.
B.W.I., Grenada.
B.W.I., St. Lucia.
B.W.I., St. Vincent.
B.W.I., Trinidad.
Canada.
Chile.
China.
Czecho-Slovakia.
Dutch East Indies.
Egypt.
Esthonia.
Finland.
France.
Holland.
Hungary.
India.
Italy.
Jamaica.
Japan.
Jugo-Slavia.
Malaya.
Malta.
New Zealand.
Palestine.
Portugal.
Roumania.
Rhodesia.
Russia.
Siam.
Spain.
S. Africa.
Sweden.
Switzerland.
Uruguay.