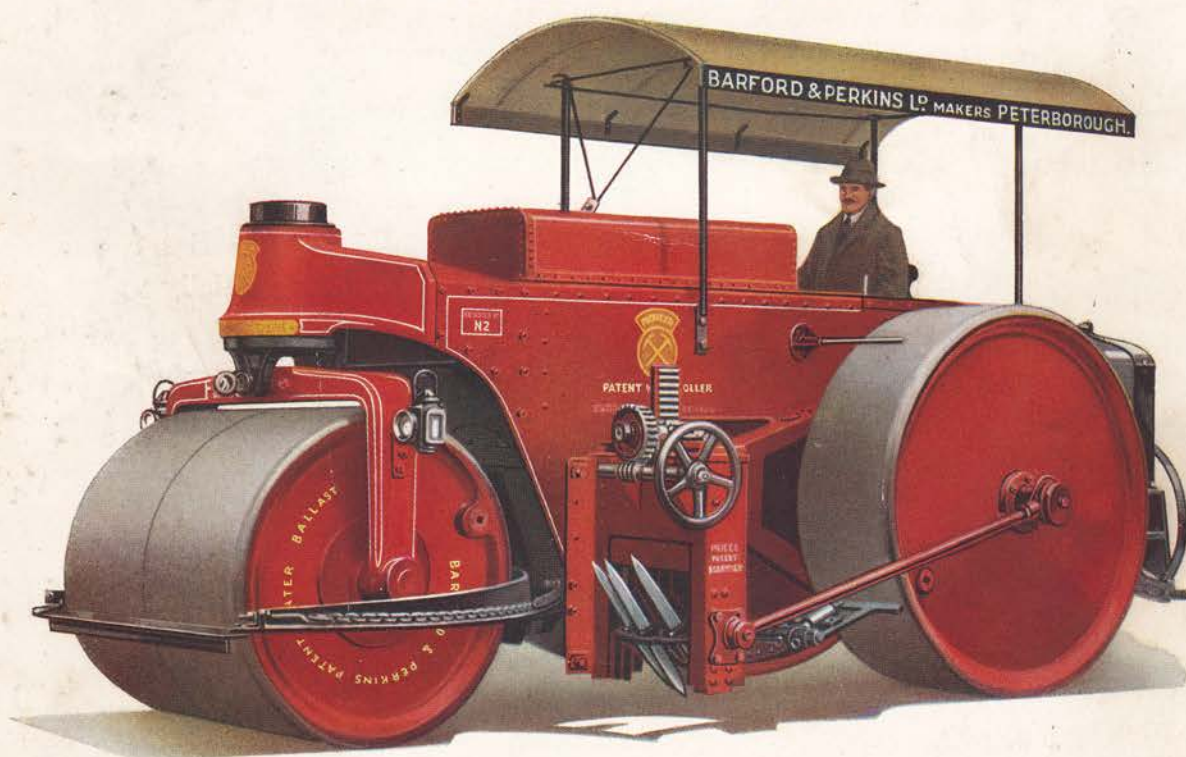




No. 853/29.

# PETROL AND PARAFFIN MOTOR ROLLERS

Three-Wheel Design.      Water Ballast.  
IN WEIGHTS 8 TO 18 TONS.



818      Barford & Perkins Ltd,  
Peterborough.

*Manufactured by*

# Barford & Perkins, Ltd.

HEAD OFFICES      PETERBOROUGH, England  
AND WORKS :

Telephones :  
Peterborough 728.  
Peterborough 729

Cables :  
"Barfords, Peterborough,  
England."

Codes :  
Bentley's and  
A B.C. (5th and 6th Editions).

## SPECIAL NOTE

*This Catalogue is a Sectional List dealing with one series only of our Rollers.*

*Our other publications are :*

- No. 773.** Sectional List describing our "A" series of Motor Rollers, in weights  $1\frac{1}{2}$  to  $2\frac{1}{2}$  tons, for grass work of all kinds ; also special Rollers for footpaths.
- No. 862.** Sectional List describing our Quick-Reverse series of Rollers with Power Steering. A specially designed Roller for bituminous carpeting.
- No. 733.** Sectional List describing the Thackray-Barford Patent Independent Scarifier, 2 and 4-tine.
- No. 877.** Sectional List describing our "T" series of Motor Rollers, equipped with High-speed Solid Injection Diesel Engine.
- No. 802.** Sectional List describing our "T" series of Motor Rollers, equipped with "GAZOGENE" (Wood-Burning Producer Gas Plant).
- No. 894.** Sectional List describing our "B" series of Motor Rollers in weights 3 and 4 tons. Three-wheel design for light road work.



# Three-wheel Water Ballast MOTOR ROAD ROLLERS

("T" SERIES)

Patent Nos. 191876/21 and 4832/09.

Registered Design Nos. 683483-4-5.

## INTRODUCTION



WENTY-SIX years ago we designed and built the first Motor-driven Roller. Our subsequent success may be gauged from the fact that during the last few years the majority of prominent steam roller manufacturers throughout the world have turned their attention to rollers driven by the internal combustion engine.

We have many more Motor Rollers at work than all the other British manufacturers combined, and a far larger trade than any other firm in the world.

**Motor Rollers are our principal manufacture—not a "side-line."** During the growth of the business we have laid out and equipped our motor roller works with specialised machinery solely for their production. For many years our Rollers have been at work in every part of the world. During that time we have maintained close touch with users of large fleets in many countries, so that our latest models are the result of a practical experience in design which is unique.

In our latest models we have more than maintained our lead in design. They embody higher powered engines, larger front rollers, more substantial construction throughout, and other valuable improvements which add considerably to the cost of manufacture.

The Barford & Perkins' Rollers are built to give long and solid service with the minimum cost of upkeep. **We sell on quality and performance in actual use—not price.**

There are machines on the market of designs cheaper to manufacture and, in particular, with cheaper engines, but our unquestioned position as the leading makers proves that our policy meets with the approval of practical users.

**During the last completed year over half our output was absorbed by repeat orders from satisfied users.** After several years of the worst slump the general engineering industry has ever experienced, the demand for our Rollers is such that we are now (1929) engaged in important extensions to our works to cope with the volume of orders.

We suggest that it is to the best interest of the user to purchase a machine of proved worth with over 26 years' experience and reputation behind it, from a firm whose greatest advertisement is thousands of Rollers working to the entire satisfaction of their owners.

## RANGE OF WEIGHTS.

This list is published to give information in particular about our "T" Series Motor Rollers, as under :—

Type.	Roller with Water Ballast, Awning, and 3-Tine Scarifier.		Water Ballasted Roller with Awning.		Roller without Water Ballast, including Awning.		Code Word.
	Tons.	Cwts.	Tons.	Cwts.	Tons.	Cwts.	
TH	11	5	10	8	8	10	<b>Forby Flexi Foray</b>
TWJ	14	9	13	15	11	10	
TWK	15	10	14	15	12	10	

The weights and measurements of the Motor Rollers illustrated and specified in this catalogue must be taken as approximate only.

It must be understood that the illustrations cannot be binding in detail as in some cases the various sizes in the same series differ in form and detail. In your interest and ours we reserve the right to modify details where experience shows such modifications to be desirable.

**T**HE advantages of our "T" Series Rollers are very well known. The very low centre of gravity (made possible by a sub-frame construction), our spring mounting and the even pull of the governed high-speed engine, account for the superior and more even consolidation of the material and the better finish of the surface given by our machines.

Users appreciate the advantage of the 20% to 25% weight variation by means of water ballast and the simplicity of ease and control for the driver enabling him to give his whole attention to his work of rolling the road.

We wish to emphasise strongly the following features which **add over £100 to the initial cost** of our Rollers and make them probably the most expensive rollers to manufacture in the world.

(1). **Travelling Speed.** In actual practice almost all road rollers have to do a good deal of travelling from job to job, to and from the Depot, etc. All our Three-wheel Rollers have a third or travelling speed of over four m.p.h. or at least 30% faster than the usual steam or two-speed motor roller speed. This is, we believe, an unique feature, and we do not know of any user who would wish to revert to the two-speed to save, say, £25 in initial cost. It is one of those features which saves its cost in time and convenience over and over again. This high travelling speed is made possible by (a) three-speed gearbox ; (b) spring mounting ; (c) ample engine power.

The high travelling speed is also useful when scarifying. It is now usual to scarify in one direction only. With our roller the idle return journey can be made at the travelling speed of four miles per hour, thus saving considerable time.

In some competing designs a third speed is embodied ; but as the engine power is low and the machine is not spring mounted, the travelling speed is not increased. Presumably the third speed (*i.e.*, the lowest speed) has been added, as it was not feasible to increase the power with a single-cylinder, slow-running engine. (See page 6 under Power to Weight Ratio.)



**(2).  
Water  
Ballast**

This represents £30/£40 extra cost, according to the size of roller. But it means that a weight variation of approximately two tons can be made with the same roller.

In other words, the scope of the roller is enlarged from a roadmaking point of view, and for travelling, crossing weak and doubtful bridges, it can always be quickly brought to its lightest form. For instance a TH Roller is either a 10½-ton or an 8½-ton Roller as desired.

**(3).  
Patent  
Sub-frame  
Construction.**

The engine, transmission and gearbox are carried as a complete assembly on a sub-frame. This sub-frame on the TWJ and TWK Rollers is constructed of 8-in. × 3-in. rolled steel channels and on the TH of 6-in. × 3-in. rolled steel channels. These channels are not bent, and there is therefore no risk of weakening by heating, as is the case where frames have to be bent to a considerable angle. The side plates are each in one piece of mild steel. The head casting is rigidly bolted to these plates, and the whole structure is braced by means of stiff cross members forming in effect a deep box girder, the sub-frame being the lower member, and the tanks and head the top member.

Apart from the question of strength and rigidity, our construction allows the sub-frame (carrying all transmission, etc., as mentioned above) to be dropped and slid out to the rear for any extensive overhaul or repair. In other manufacturers' designs, the gearing and transmission being under the engine and very inaccessible, the whole engine has to be removed to get at them.

A comparison of our design with others will show both the superiority of our machine and the extra manufacturing cost involved.

This construction is far superior to that of any other roller on the market, and enables the scarifier to be bolted direct to this box frame, without any possibility of distortion, no matter how hard the work may be.

**(3a).  
Scarifying.**

In almost every other roller we know, the side plates carry the shafts for the transmission. This means that any temporary slight distortion of the plates due to shocks when scarifying would throw the transmission out of line. Further, there is a great advantage in the position in which our scarifier is secured to the roller over that usual on other makes of rollers. Being placed between the front and back rollers, the attachment is such that it is at the point of least vertical movement (see page 13). It does not require much thought to realise the advantage of this method against that of a scarifier secured to a road roller at the rear of the back axle, particularly when working over undulating surfaces. The scarifier in the latter position at one moment digs in deeply and the next moment is clear of the surface owing to the rise and fall of the road roller over irregularities. With our scarifier this cannot happen, owing to its central position. We get evenness of cut which is most important. The purpose of scarifying is not to disturb the sub-grade but only the rough surface. With scarifiers in the rear it is the contrary that happens. With our scarifier the stresses that arise in scarifying are evenly distributed over both front and rear axle. The centrally disposed scarifier in action assists adhesion between the road surface and driving rollers. If the scarifier is placed at the rear of the driving rollers it causes the machine (in action) to act as a lever with the rear axle as a fulcrum and often makes steering difficult, owing to the front rollers being lifted off the road. A tendency to skid when scarifying hard surfaces is very noticeable with this class of scarifier. The rapidly varying shocks thrust on the road roller by the scarifier placed to the rear of the back axle, are a frequent cause of axle breakage owing to the fatigue of material and crystallisation of the metal that ensues.



(4).

**Springs.**

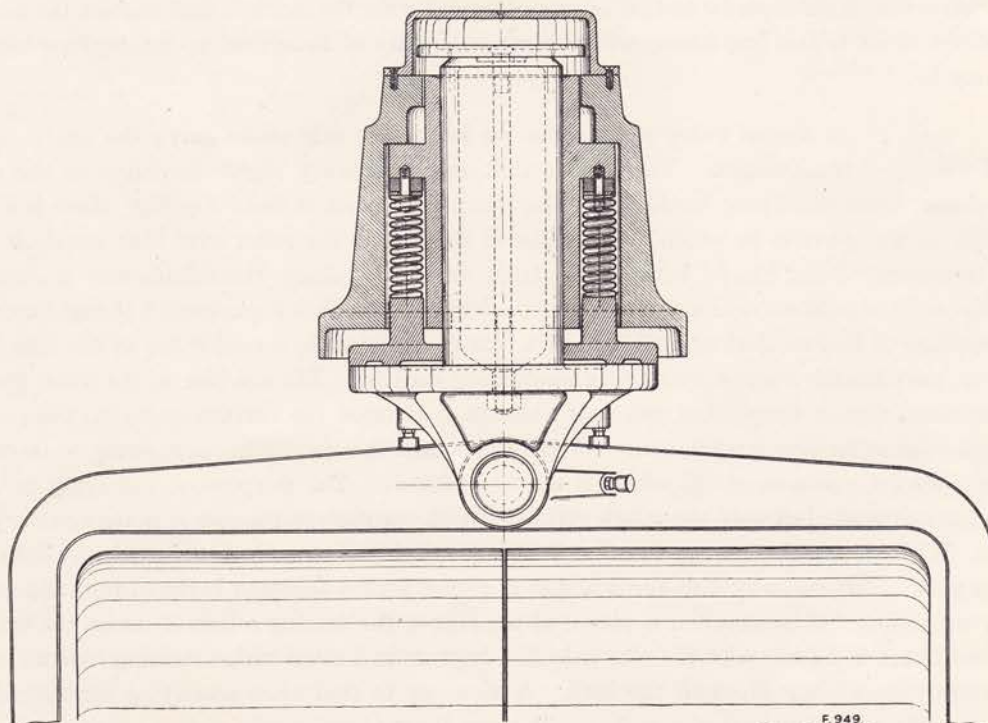
Some makers contend that the use of springs interferes with the efficiency of the Roller. We do not agree; we think it is entirely the contrary. The duty of a roller is to press and "work" the stones into place—not jump on them, possibly crushing them—and a spring-mounted roller consolidates road material more evenly than an unsprung roller.

Springs absorb road shocks, particularly when travelling from place to place, thus lengthening the life of the roller and reducing maintenance costs; without spring mounting high travelling speed would not be possible without risk of damage. The driver is also saved the shocks and vibrations of an unsprung machine.

Our Patent Spring Steering Head, by allowing a certain movement of the front part of the frame (both upwards and downwards), relieves the strain on engine, gearing and driving chain when the roller is started from rest, thus providing, in simple form, all the advantages of a spring drive.

Springs add, of course, considerably to the cost of manufacture, and some designs do not permit of their use.

The foregoing are four features which add over £100 to the cost of our machine. **In other words, we could design and build a roller to sell at £100 less, but we do not know of a user who would wish us to do so.**



F. 949  
Barford & Perkins Ltd. Peterborough

Section through Patent Spring Steering Head.

**Smooth Rolling Action.** A great disadvantage of any roller fitted with a single-cylinder slow-speed engine for up-to-date road-making is that the modern bitumen-bound road necessitates an even-turning effort of the rolling wheels. This is the main advantage at the present day of the compound steam roller over the single-cylinder type. And it is the still smoother action and more regular and constant pull of our multi-cylinder "governed" engine that make the work of our rollers superior to compound steam and very much superior to any roller driven by a single-cylinder internal-combustion engine. Note the number of power impulses of four-cylinder high-speed against single-cylinder slow-speed on page 7, paragraph marked (a).

**The above is a most important point for any form of bitumen-bound roadmaking.**

**Correct Distribution of Weight.** A single-cylinder engine has to be set right forward in the frame, throwing too great a proportion of weight on the front rollers. The weight is not used to the best advantage, as for rolling and adhesion the weight should be on the driving rollers. Incidentally, also, the steering is made very "heavy" for the driver when there is undue weight on the front rollers.

**Lower Centre of Gravity.** It is very essential that the centre of gravity of a road roller should be as low as possible. Often it is not easy to judge this point from a catalogue or illustration. Appearances may be deceptive, as plate work may be carried high to preserve symmetry of line. This is true of our own design; also the sprinkling water tank (when required) is placed high. But actually this is a very small proportion indeed of the total weight of the machine.

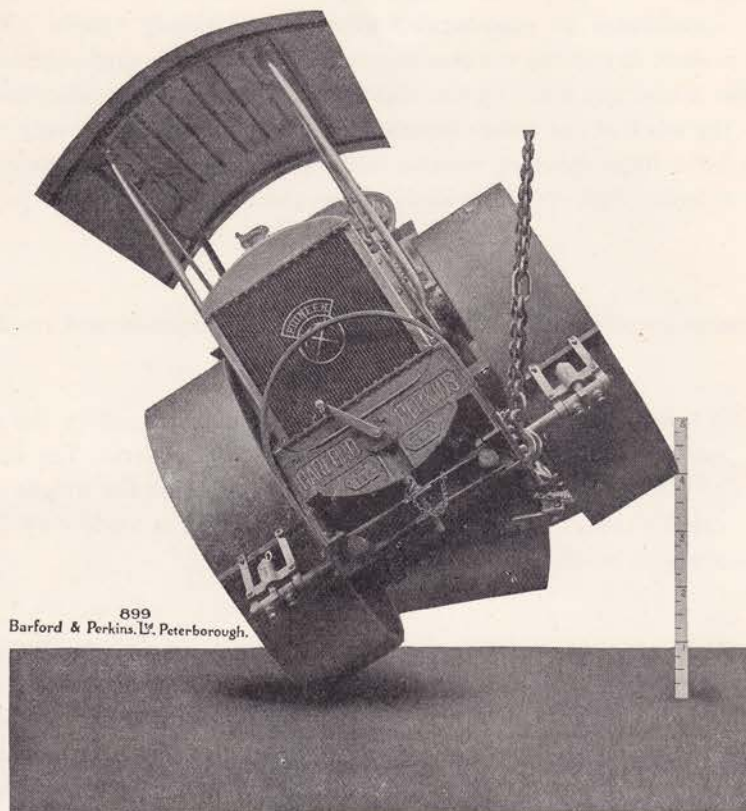
From the point of view of stability, a roller with a single-cylinder, slow-running engine, with its crankshaft about 5-ft. 0-in. above the ground, resembles a ship with its engines placed on top deck, or as far as possible from where they should be. In our "T" Rollers the crankshaft is only 2-ft. 1-in. from the ground level, helping to give a very low centre of gravity, and as near as possible to the point at which the power has to be applied to the road.

We believe that the centre of gravity of our machine is lower than that of any competing roller. It is certainly a great deal lower than in the case of any roller fitted with a heavy single-cylinder engine, or than a steam roller. As a matter of fact, the centre of gravity of the whole machine is actually below the axle.

Apart from the front rollers and driving wheels, the great bulk of the weight of our rollers is in the sub-frame which carries the engine gearbox and all the transmission set right down in the chassis.

In rollers with single-cylinder engines, the very heavy engine is necessarily set high up in the chassis, making the machine top-heavy.





On our TH, TWJ or TWK Types it is possible to incline the whole machine sideways until one Roller is 4-ft. from the ground, without falling over.

**Power to Weight Ratio.**

Some years ago, as a result of experience, we increased materially the power on all our Rollers. Many motor rollers are under-powered in that they have not the necessary reserve to meet emergencies. It is frequently necessary to work on steep gradients with a bad surface. Under such circumstances it is essential to have an ample reserve of power.

Compare the power of our engine with that of our competitors. **It would not be possible to put a 36-40 h.p. single-cylinder engine in a road roller as the size and weight would be excessive.** The manufacturer is therefore forced to fit a lower powered engine without the same reserve of power.

It is quite erroneous to suppose that the designer of a road roller does not have to consider weight at all. A large proportion of the total weight must be in the wheels themselves, and the frame, transmission, etc., have to be very sturdy, particularly to withstand the shocks of scarifying. If the engine is light, more weight can be put in the wheels by increasing the thickness of the rim, thereby giving longer life, which is very much to the advantage of the user.



Below we summarise the foregoing, also other features of importance.

## Barford & Perkins' Motor Roller.

- (a) **20 power impulses per foot of travel at slow speed.**
  - (b) 25-28 B.H.P. up to  $8\frac{1}{2}$ /10 $\frac{1}{2}$ -ton roller; 36-40 B.H.P. on heavier rollers.
  - (c) Extremely low centre of gravity. Engine and gearing below centre line of driving rollers.
  - (d) Mechanism assembled on special sub-frame, and arranged for easy access during repairs and maintenance.
- Very strong and rigid frame construction.
- (e) Correct distribution of weight.
  - (f) Small flywheel. No gyroscopic effect.

## Rollers with Slow-Speed Engines.

- 1 power impulse per foot of travel at slow speed.**
- Usually much less power.
- High centre of gravity. Engine perched high above centre line of driving rollers.
- Gearing and transmission placed below engine, with bearings and journals in main frame, subject to twisting stresses in operation.
- Inaccessible for repairs, as engine must be removed to get at gearing.
- Too much weight on front rollers.
- A noticeable gyroscopic effect, making steering difficult and affecting quality of work done. This is due to the two heavy flywheels, twice the weight, running at twice the speed of even a steam engine flywheel, and mounted high up on the machine.
- (g) All gearing machine cut. Enclosed gear box with gears running in oil.
  - (h) Gear changing and reversing as easy and simple as on pleasure car or lorry.
  - (j) Driver comfortably seated in high-sided cab with all controls placed to hand.
  - (k) Clutches running at engine speed.
  - (l) The Sprinkling Water Tank is entirely independent of the cooling water supply, and depends purely on gravity for feeding water to the sprayers for the front and back rollers.
- Open and noisy gearing. Subject to excessive wear, as it is not protected from abrasive grits.
- Gear changing awkward owing to heavy sliding pinions and the coarse pitch of the gears.
- Exposed position for driver on high platform standing to his work with no protection from the weather.
- Much slower speed clutches with consequently greater loads and liability to cause severe stresses when suddenly engaged.
- In most designs same tank used both for engine cooling water and for supplying sprinklers. Very dangerous, as by oversight a driver may easily use all contents for sprinkling and cause serious engine trouble from over-heating. Pump required for delivering water to sprays.

The foregoing shows clearly the great superiority of our design over those machines fitted with single-cylinder engines.

## Motor Rollers versus Steam Rollers.

The advantages of motor drive are now becoming very widely recognised, as is shown by the very rapid increase in the use of Motor Rollers.

But, some Engineers are still unwilling to give Motor Rollers a trial, often because of the higher initial cost.

There is still in some quarters, the erroneous impression that Motor Rollers are more costly in upkeep, require more skilled attention and do not have as long working life as steam Rollers.

## Advantages of Motor Drive.

The following are the principal advantages responsible for the growing use of motor rollers.

**Greater ease in handling.** On a steam roller the driver usually has to **stand** to his work, and his duties include :—

- (1). Steering.
- (2). Regulating the throttle valve.
- (3). Breaking and sizing coal.
- (4). Firing the boiler and keeping a clear fire.
- (5). Maintaining the water level and boiler pressure.
- (6). Taking up additional coal and water.

A motor roller is clean and compact, the engine speed is automatically governed, and the driver's sole duty comparable to the above while at work is :—

### To sit and steer.

His whole attention can be concentrated on his primary job—rolling the road in accordance with his orders from the road foreman.

The steam roller driver usually has a mate. A second man to help the motor roller driver is never necessary except when scarifying.

**No Wasted Fuel.**—Road rolling in conjunction with a gang of men is usually an intermittent job. When not actually rolling, the engine is stopped and no fuel is consumed.

### No Time is Wasted

Getting up steam.

Stoking boiler.

Taking up water.

The one day a fortnight required for washing out the boiler is saved.

### No Smoke—No Dirt.

### Low Cost of Repairs.

### Time Saved in Repairs.

All wearing parts are renewable, interchangeable and quickly and easily fitted.

The engines on all types are immediately accessible on lifting the bonnet.



## Durability and Maintenance.

All our recent experience and reports from users confirm the claim that we first made many years ago that—

The cost of spares over a period of years is much less in the case of a Motor Roller than a Steam Roller of equal weight.

The average life of an engine on one of our Rollers is at least as long as the average life of a firebox on a steam roller.

Further, a new engine complete can be fitted at much less than the cost of full boiler repairs to a steam roller.

Similarly a complete engine overhaul can be done by a mechanic on the spot, in a fraction of the time and at a fraction of the cost of a similar overhaul on a steam roller.

The latter would, as a rule, have to be sent to a works with special facilities for such work, and the repair might easily take two months.

A further saving effected by a Motor Roller as against a Steam Roller is that the former involves no fees for Boiler Insurance. There is also the saving of periodic inspection and loss of efficiency due to lowering of working pressure.

A motor roller eliminates the troublesome problems connected with the water level in the boiler of a steam roller when working on gradients.

**Fuel.** Our Motor Roller carries sufficient fuel for 7 to 10 normal working days dependent on the nature of the work. It can be re-fuelled in 10 minutes. The fuel being liquid, gravitates to the engine and is consumed automatically without further attention by the driver.

The steam roller carries only sufficient coal for one day's work and requires at least 20 minutes per day for filling the tender. The fuel, being solid, requires to be handled into the firebox by the driver and the clinker and ashes must be disposed of by the driver.

The weight of fuel consumed by the motor roller never exceeds 56-lbs. per day, whereas the steam roller consumes a minimum of 400-lbs. per day, or seven times as much, all of which must be transported to the machine at work. In remote districts the freight charges on this additional tonnage of fuel represent a considerable addition to the actual working costs.

**Water.** The motor roller requires only about one quart of water per week to make up radiator losses, whereas with the steam roller it is necessary to fill the boiler feed tank at least twice per day of eight hours, and the time taken for this duty reduces correspondingly the time available for useful work. An ordinary 10-ton steam roller consumes about 400-lbs. of steam per hour when in work. For an eight-hour day, therefore, about 320 gallons of water are required. Where this volume of water has to be carted and hand pumped into the water-cart, it is no uncommon experience to find a horse and man with water-cart engaged solely on this duty. A conservative estimate of the cost for this item in England is 15/- per day! If we consider now



the two items of fuel and water and reckon the savings which can be effected on these by the use of a motor roller in a country district, we get :—

**250 Working Days per Annum.**

	£	s.	d.
Coal transport, say 5/- per ton, one ton per week, 50 weeks .. .. .	12	10	0
Water transport 15/- per day for 250 days .. .. .	187	10	0

**Saved by Motor Roller per Annum on Coal and Water Transport only .. £200 0 0**

**The foregoing costs vary considerably in different parts of the world, according to local conditions.**

The above sum is sufficient to wipe out the capital cost of a 10-ton **motor** roller in four years or, in other words, it is equivalent to a dividend increase of 25 per cent. on the capital invested as compared with a similar sum invested in a steam roller.

**Time Saving.** The motor roller is as easily started as the average pleasure car, and is available for work within five minutes of the arrival of the men on the job. A steam roller usually requires at least one hour each morning for raising steam before work can be started, and if the machine is to be kept in a reasonable state of efficiency, every second Saturday must be devoted to washing out the boiler.

Taking again an average of 250 working days per annum, these items represent the following additional rolling hours in favour of the motor roller :—

One hour per day, 250 days .. .. .	250 hours.
25 Saturdays, four hours each .. .. .	100 „

**Additional Rolling Hours in favour of the Motor Roller .. 350 „**

A very conservative figure for a steam roller is 5/- per hour, so that the cash value of these additional rolling hours is £87 10s. od. per annum, which sum is more than sufficient to pay for the depreciation on the motor roller on a ten years' purchase basis.

The general design of Steam Road Rollers has not changed to any large extent for over 30 years. Generally speaking, the gears and transmission shafting of a steam roller are more massive than essential for their purpose. It is most unusual to see a Steam Road Roller with a compact, totally enclosed transmission. Many of the gears, instead of being machine cut, are just cast in sand, with the abnormal clearance between teeth necessary to enable them to run satisfactorily. This clearance causes backlash of the teeth, with a consequent noisiness, and it is impossible to get smooth and even running, as strains are thrown on the teeth, sometimes causing them to break. When using the scarifier to the rear of the axle, this back-lash allows rapid and abnormal wear to take place on the transmission shaft bearings due to the rapidly varying shocks transmitted.

**Valve Setting.** In setting the valves for a steam engine it is absolutely essential that a man with specialised training should be employed, whereas a mechanic in almost any wayside garage is capable of timing the valves of an internal combustion engine.

**Cleanliness.** A great advantage of a Motor Roller over a Steam Roller is cleanliness of operation in towns and cities. Residents have no cause to complain to the Council when a motor roller is used. Just after stoking a steam roller on a windy day, residents living near the place where the road roller is working have cause for complaint, apart from any danger that may be caused by sparks flying from the chimney.



**Excellence of Work Produced.** We have many of our large three-wheel machines at work in the large cities of England, some of them engaged almost entirely on **Hot Asphalt Work**. For this duty extremely smooth starting and travel are necessary. These are outstanding features of our machines and several prominent City Engineers have mentioned to us the marked improvement of their road surfaces since the adoption of our Three-wheel Rollers. We should be pleased to give prospective buyers the names of well-known road engineers in England, and we are confident that they will fully support the above statement.

**Power Steering.** A simple and effective power steering gear can be fitted, and is recommended for **Hot Asphalt Work**, where quickness of operation is essential.

**Time Saved in Repairs.** The engines are of the usual four-cylinder, four-cycle type, similar to those used on the highest class of commercial vehicles. They are of the highest class workmanship and design, of robust construction throughout, and with an ample reserve of power. Being governed to run only at a moderate speed, and the work requiring for the most part a proportion only of the power available, the repairs and maintenance costs are very moderate.

All wearing parts are renewable, interchangeable and quickly and easily fitted.

The engines on all types are immediately accessible on lifting the bonnet.

**Depreciation.** This should be allowed for at the same percentage as in the case of a steam roller. The engine of the motor roller will give at least as long service as the firebox of a steam roller, both under average conditions. Being a separate unit from the rest of the machine, the engine can be removed or replaced, temporarily or permanently, in a few hours.

**Range of Sizes.** We manufacture Motor Rollers in a wide range of sizes and types, in weights of 18 tons down to  $1\frac{1}{2}$  tons—a more complete range than that offered by any other maker.

Their uses include :—

Road-making and repairing of all kinds, including special Rollers for footpath work and for bituminous carpeting.

Also all kinds of grass work, such as racecourses, polo grounds, aerodrome landing grounds, cricket grounds, football grounds and golf links.

**The following pages illustrate and describe only our Three-wheel Series of Rollers for foundation work and the heaviest forms of road-making.**

*A list of the publications describing our many other sizes and types will be found at the beginning of this catalogue.*

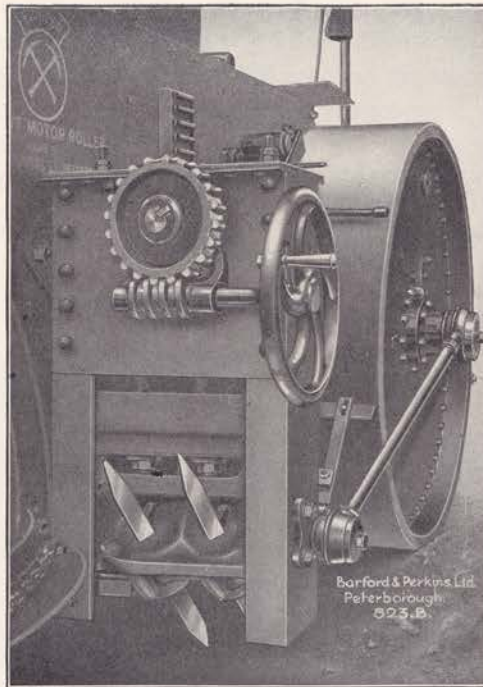
**Three-wheel Series.** The characteristic features of these Rollers are the short wheel-base and the very low centre of gravity. The design is the result of our unique experience in the manufacture of rollers of all types and possesses the exceptional strength and durability necessary for the heaviest kind of road-making. All parts are of liberal proportions, and are so designed that the minimum amount of attention is required. The working parts can



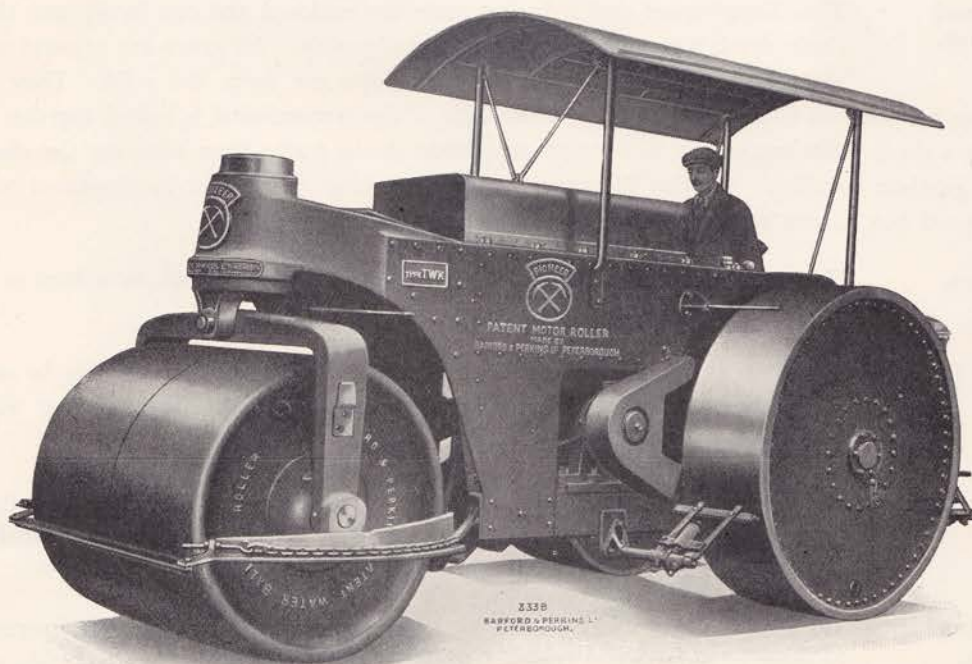
be renewed without disturbing the main structure. The rollers have been designed for real hard work, and efficiency has not been sacrificed for the sake of any reduction in manufacturing cost. The whole of the transmission, with the exception of the final chain drive to the back rollers, is enclosed in oil-tight casings, and the gears run in oil. The four-cylinder engine is of 40 B.H.P. in the case of TWJ and TWK and 28 B.H.P. for TH; the fuel used is paraffin or petrol. Ample power is provided for working on steep hills. A few of the outstanding features are described below.

<b>Large Diameter Rollers.</b>	The back rollers are 5-ft. 6-in. diameter for TWJ and TWK and 5-ft. diameter TH. The front rollers are 4-ft. diameter for TWJ and TWK and 3-ft. 6-in. TH. There are no projections beyond the rims of the back rollers.
<b>Construction of Rollers.</b>	The rollers are fitted with steel plates, accurately machined to fit in recesses in the rims and hubs. A more even distribution of the load on the rim of the rollers is obtained by this method, and the securing bolts are not subjected to any shearing load due to the weight of the machine. With this construction trouble due to loose or broken spokes is entirely obviated.
<b>Overlap of Rollers.</b>	The overlap is unusually large, being 4-in. on each side. This prevents any ridges being left when rolling.
<b>Variable Weight.</b>	By means of our well-known water ballast principle, the weight of the rollers can be increased by filling the back and front rollers—by about 2 tons on the TWJ and TWK and by about $1\frac{1}{4}$ tons on TH. The variable weight can be increased still further when a water sprinkling tank is fitted, making a total increase of weight of about $2\frac{1}{2}$ tons on TWJ and TWK and about $1\frac{3}{4}$ tons on TH.
<b>Short Wheelbase.</b>	The wheelbase is only 8-ft. 9 $\frac{1}{2}$ -in. on TH and 9-ft. 10-in. on TWJ and TWK, thus enabling the larger rollers to be turned completely round in a 32-ft. roadway and the TH type in a correspondingly smaller space.
<b>Seat for Driver.</b>	A well-padded seat is provided for the driver. This, together with the springing system previously described, insulates the driver from the jarrings so unpleasant and tiring on unsprung rollers.
<b>Water Sprinkling Tank.</b>	Capacity 120 gallons, with sprinkling water pipes to both back and front rollers. This tank is an extra fitting which is strongly recommended for tar road work of any kind, whilst in the absence of a water cart, it can be used on water-bound macadam roads. A uniform supply of water is obtained on the surface of the rollers, and rolling and watering are done at the same time. The water is used more economically, an important item in country districts. The water flows by gravity to both back and front rollers, thus dispensing with any mechanical pump. The supply can be controlled by the driver from his seat.
<b>Fuel Storage Tank.</b>	In addition to the service tank containing about 6 gallons, a fuel storage tank is fitted of 50 gallons capacity for TWJ and TWK and 30 gallons for TH. This holds enough petrol or paraffin for a full week's work, the fuel consumption being about 5 to 7 gallons for TWJ and TWK and 4 to 5 gallons for TH per day on average work.





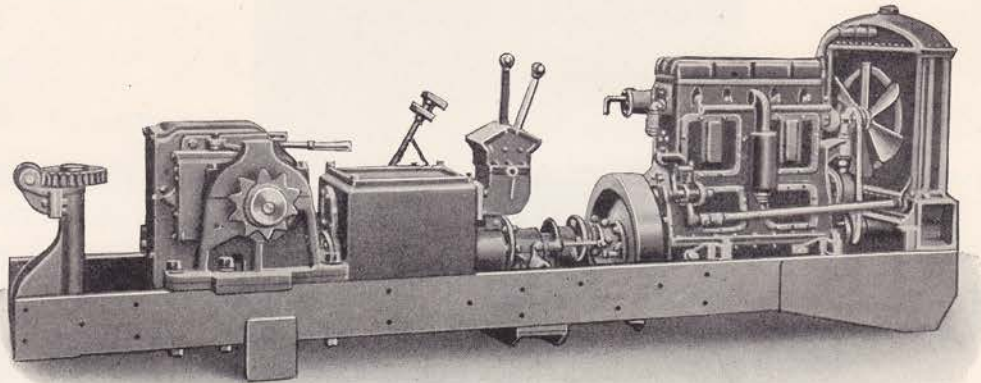
Two-tine Attached Scarifier for T Series Rollers.



12½-ton Type TWK Motor Roller.

**Three Speeds.** To save time in travelling from place to place, a fast travelling speed of 4 miles per hour is provided, in addition to the rolling speeds of  $1\frac{1}{8}$  and  $2\frac{1}{2}$  miles per hour for TH and  $1\frac{1}{4}$  and  $2\frac{3}{4}$  miles per hour for TWJ and TWK. All speed changes are controlled by one lever, with a separate lever for reversing. Central gate change with selector rods is used as in modern car and lorry practice. The travelling speed is obtained by means of a direct drive through the gear box (on TWJ and TWK), thus saving wear on the gearing.

The speeds can be varied within wide limits by throttling the engine, as on level roads only a small proportion of the engine power is required.



View of Patent Sub-Frame.

**Enclosed Gearing.**

The change-speed and reducing gears are enclosed and run in oil, and the final chain drive is protected by sheet-metal guards. All gears are of steel and, including the differential gear, are machine cut from the solid. They are of generous proportions to ensure long life. The whole of the transmission is bolted together as one unit on a three-point suspension to prevent any strain in the frame from affecting the alignment of the gearbox spindles. On the TH type the spur-reducing gear is not incorporated with the three-speed box as one unit, but is protected by sheet-metal guards.

**Repairs.**

The cost of Repairs, as shown by the records of rollers which have been in use for periods up to twenty years, is remarkably low.

**Spare Parts.**

A full stock of Spare Parts is held at the Works, and details can be supplied promptly. A list of Spare Parts is published with distinguishing numbers, diagrams and Code Words.

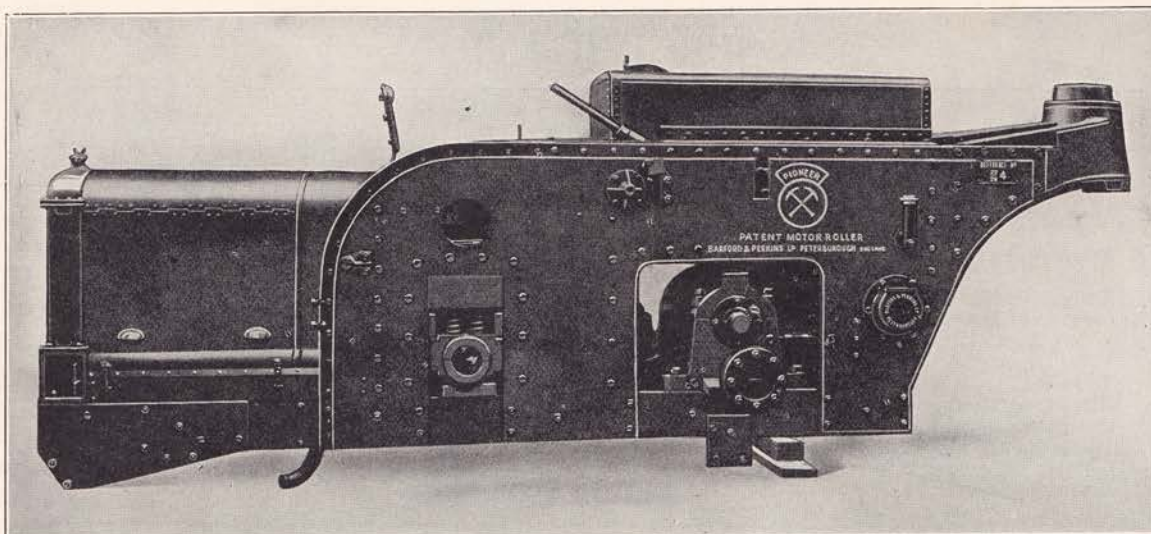
**Testing.**

Before despatch every Roller undergoes a test of several days' duration in actual work, and no effort is spared to make it in every way a strong, capable and reliable machine.

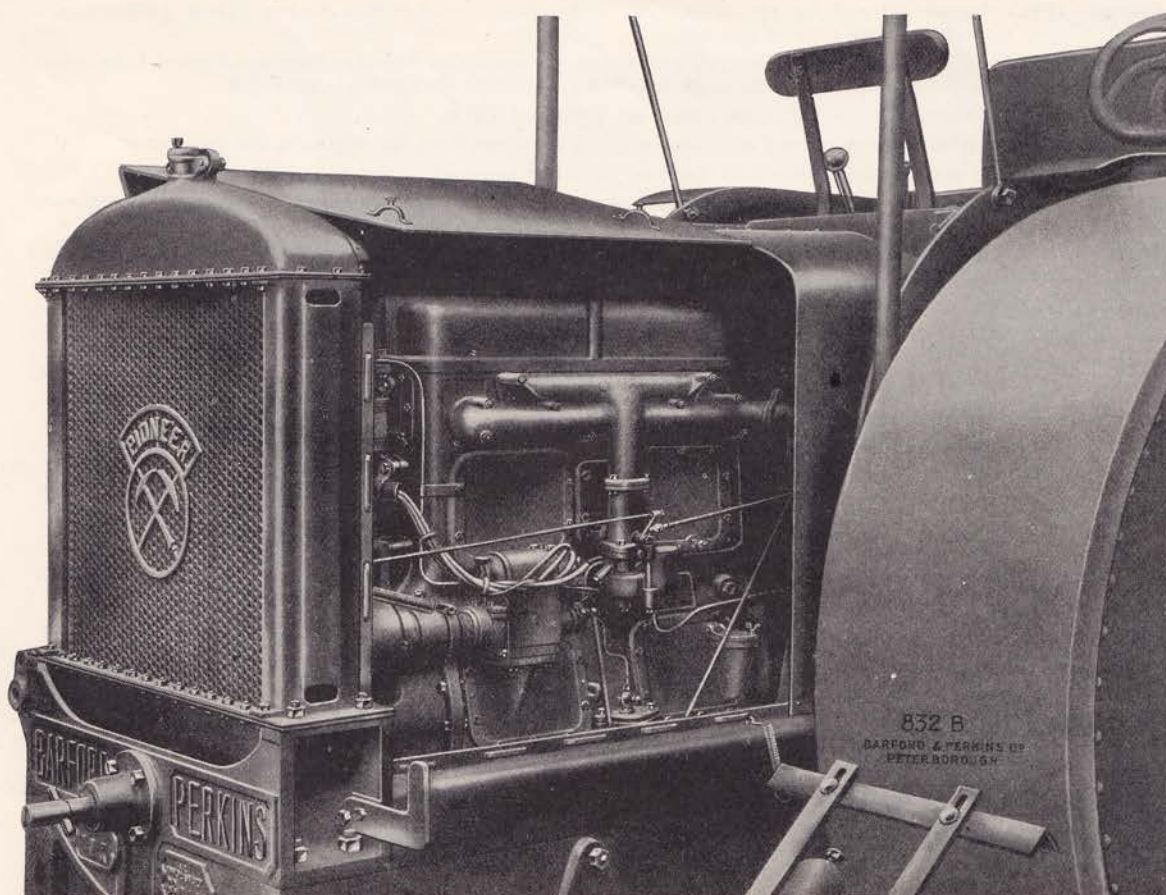
**Working Trials.**

We shall be glad at any time, by appointment, to show interested persons one or more of our various types of Rollers in actual work at Peterborough, and our technical advice and the results of our experience are always at the disposal of bona-fide enquirers.





View showing great strength of our Patent Frame. This exceptional design allows an attached Scarifier to be used without any risk of damaging strains being transmitted to engine or gearing.



View of Engine with Bonnet lifted, showing accessibility of Engine.



## SPECIFICATION

	TH	TWJ	TWK
Code Word .. ..	<b>Forby</b>	<b>Flexi</b>	<b>Foray</b>
Nominal Weight .. ..	8½ tons	11½ tons	12½ tons
Back Rollers .. ..	5-ft. 0-in. dia. × 1-ft. 5-in. wide	5-ft. 6-in. dia. × 1-ft. 5-in. wide	5-ft. 6-in. dia. × 1-ft. 7½-in. wide
Front Rollers .. ..	3-ft. 6-in. dia. × 4-ft. 2-in. wide	4-ft. 0-in. dia. × 4-ft. 2-in. wide	4-ft. 0-in. dia. × 4-ft. 2-in. wide
Rolling Width .. ..	6-ft. 4-in.	6-ft. 4-in.	6-ft. 9-in.
Overlap of Rollers .. ..	4-in.	4-in.	4-in.
Wheel Base .. ..	8-ft. 9½-in.	9-ft. 10-in.	9-ft. 10-in.
Total Length .. ..	16-ft. 8-in.	18-ft. 1½-in.	18-ft. 1½-in.
Total Width .. ..	6-ft.	6-ft. 4-in.	6-ft. 9-in.
Height without Awning .. ..	6-ft. 10-in.	6-ft. 11½-in.	6-ft. 11½-in.
Height over Awning .. ..	9-ft. 1-in.	9-ft. 3-in.	9-ft. 3-in.
Water Ballast (approx.):			
With Water Tank .. ..	1 ton 16-cwts.	2 tons 10-cwts.	2 tons 12-cwts.
Without Water Tank .. ..	1 ton 6-cwts.	2 tons	2 tons 2 cwts.

**Speeds.**—1½, 2½ and 4 miles per hour, both Forward and Reverse (TH).  
 Rolling 1½ and 2½ miles per hour, both Forward and Reverse } TWJ and TWK.  
 Travelling 4 miles per hour (Forward only).

**Horse Power.**—(Petrol) 28 B.H.P. (TH).  
 (Petrol) 40 B.H.P. (TWJ and TWK).

**Engine.**—TH. Four-cylinder 98 by 127 m/m. uses either Petrol or Paraffin—Albion Patent Lubrication—Governor—High-tension Magneto.

TWJ and TWK. Four-cylinder 120.5 by 140 m/m. uses either Petrol or Paraffin—Forced Lubrication—Governor—High-tension Magneto—Pump for water circulation—Air Filter.

**Clutch.**—Single Plate Clutch for TH, Cone Clutch on TWJ and TWK.

**Radiator.**—Car type with large cooling area, assisted by Fan driven from the engine in the usual manner.

**Gears** of steel and machine-cut throughout, enclosed and running in oil.

**Ball Bearings** on Primary Shaft (TWJ and TWK) and Ball Thrust Washers for Bevel Gears (all in separate housings).

**Flexible Couplings** between Engine and Gear Box.

**Three-point Suspension** of Transmission Unit.

**Brakes.**—Auxiliary Screw Brake on Back Axle in addition to Foot Brake on Transmission.

### EXTRA FITTINGS.

Code Words.

**Awning.**—In temperate climates an awning is considered unnecessary for this type of roller, and is not provided as standard equipment. For hot countries it can be supplied at an extra charge .. .. } TH, TWJ or TWK } Fucus Tabor

**Fuel Storage Tank.**—Capacity 30 gallons for TH.  
 Capacity 50 gallons for TWJ and TWK.

**Water Sprinkling Tank** for TH.—120 gallons. Sprinkling Pipes to Front and Back Rollers .. .. Fyrde

**Water Sprinkling Tank** for TWJ or TWK.—120 gallons. Sprinkling Pipes to Front and Back Rollers .. .. Tanky

**Differential Gear** for TH, TWJ or TWK .. .. Tifer

**Scarifier.**—Price Patent "Resilient" Scarifier or other make, TH, TWJ or TWK .. .. Tasca

**Pulley and Extension Bracket** for driving a Stone Breaker or other machinery (TH) .. .. Furze

**Pulley and Extension Bracket** for driving a Stone Breaker or other machinery (TWJ or TWK) .. .. Texpy

**Water Pump** (Power Driven) .. .. { For filling the tank and rollers in country districts } Tumps

**Water Pump** (Semi-Rotary Hand Pump) .. { (supplied complete with Suction and Delivery Hose). } Turba

**Spring Drawbar** for hauling (fitted on the back of the roller frame), TH, TWJ or TWK .. .. Drwbr

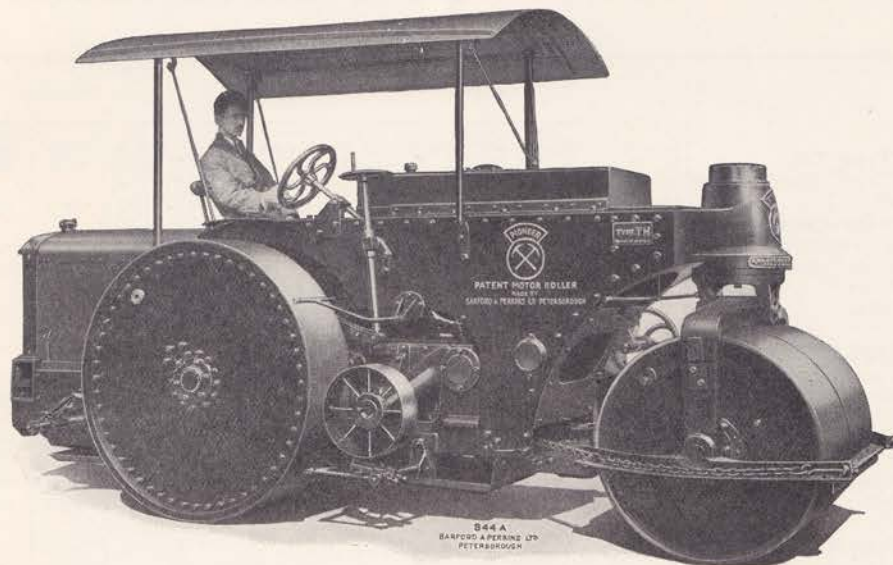
**Spring Draw Lug** for hauling (fitted on the front of the roller bridge), TH, TWJ or TWK .. .. Talug

**Winding Drum and Rope** (TH).

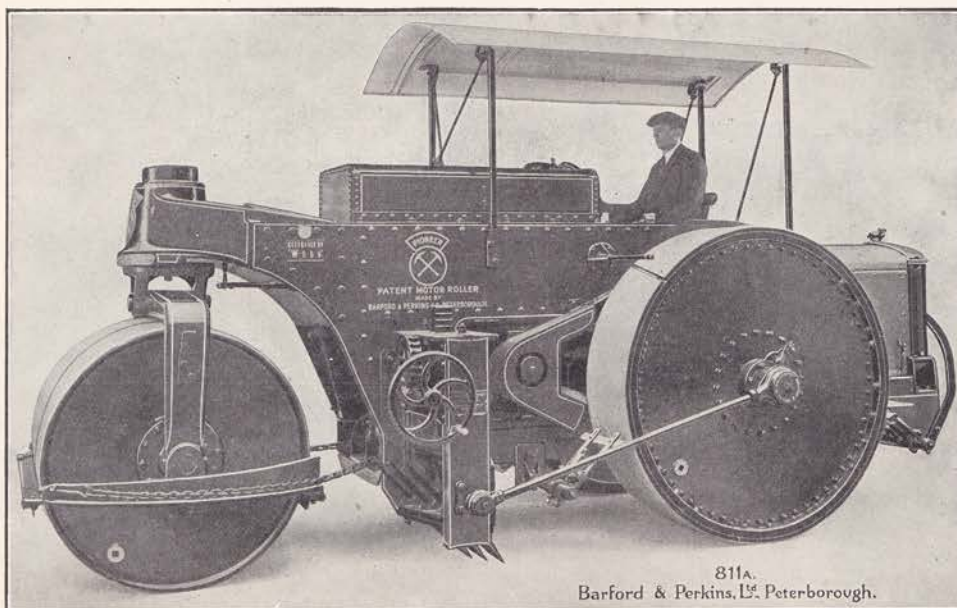
**Side Curtains and Rods.**

**Steel Plating** of Back Rollers.





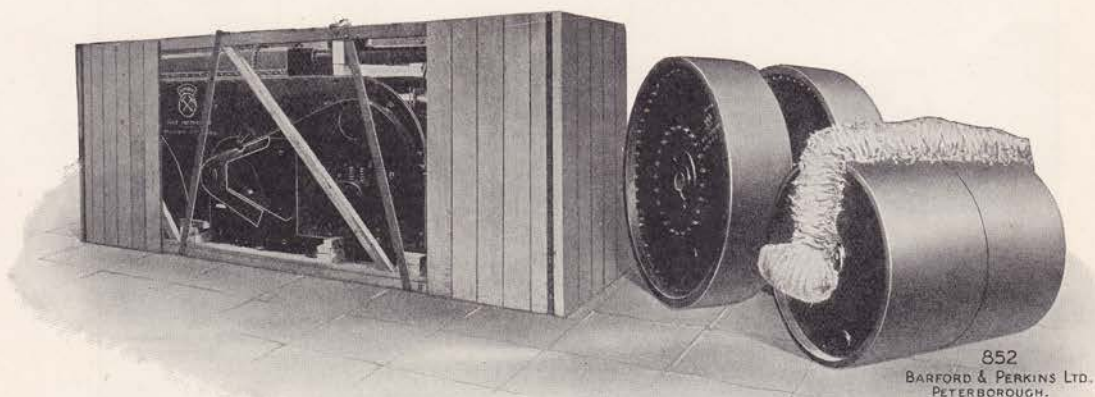
8½-ton—Type TH with pulley and extension bracket for driving a stone-breaker or other machinery.



11½-ton—Type TWJ.

## APPROXIMATE SHIPPING SPECIFICATION

	English.					Metric.				
	Length ft. in.	Width ft. in.	Depth ft. in.	Gross Weight T. C. Q.	Net Weight T. C. Q.	Length m/m	Width m/m	Depth m/m	Gross Weight Kilos	Net Weight Kilos
<b>Type TH.</b>										
1 Frame and details (close packed) .. .. .	15 3	3 10	6 3	4 9 2	3 9 0	4650	1170	1905	4545	3505
1 Front Roller Assembly with bridge (protected) .. ..	5 7	3 6	4 1	1 12 1	1 12 1	1700	1070	1245	1640	1640
1 Awning, etc. (cased) .. ..	8 9	5 7	1 6	1 3 1	1 2 1	2670	1700	460	1180	1130
1 Back Roller .. .. .	5 0	1 5	5 0	1 4 1	1 4 1	1525	432	1525	1230	1230
1 Back Roller .. .. .	5 0	1 5	5 0	1 4 1	1 4 1	1525	432	1525	1230	1230
<b>Type TWJ.</b>										
1 Frame and details (close packed) .. .. .	17 2	3 11	6 9	7 0 0	5 13 0	5235	1195	2060	7105	5735
1 Front Roller Assembly with bridge (protected) .. ..	5 9	4 0	4 8	2 6 0	2 6 0	1755	1220	1425	2335	2335
1 Awning, etc. (cased) .. ..	8 11	5 10	1 4	0 13 0	0 11 0	2720	1780	405	660	560
1 Back Roller .. .. .	5 6	1 6	5 6	1 12 0	1 12 0	1675	460	1675	1625	1625
1 Back Roller .. .. .	5 6	1 6	5 6	1 12 0	1 12 0	1675	460	1675	1625	1625
<b>Type TWK.</b>										
1 Frame and details (close packed) .. .. .	17 2	3 11	6 9	7 0 0	5 13 0	5235	1195	2060	7105	5735
1 Front Roller Assembly with bridge (protected) .. ..	5 9	4 0	4 8	2 16 0	2 16 0	1755	1220	1425	2845	2845
1 Awning, etc. (cased) .. ..	8 11	5 10	1 4	0 13 0	0 11 0	2720	1780	405	660	560
1 Back Roller .. .. .	5 6	1 8	5 6	2 0 0	2 0 0	1675	510	1675	2030	2030
1 Back Roller .. .. .	5 6	1 8	5 6	2 0 0	2 0 0	1675	510	1675	2030	2030



Views showing method of packing Roller for export  
(Portion of side of Main Packing Case removed.)



# Barford & Perkins' Motor Rollers

HAVE BEEN ADOPTED BY

H.M. THE KING

His Majesty's Government  
The French Government  
The Russian Government  
The Italian Government  
The Spanish Government  
The Egyptian Government

The Japanese Government  
The Norwegian Government  
The India Office  
The Commonwealth of Australia  
The Dominion of Canada  
The Dominion of New Zealand

## THE CROWN AGENTS FOR THE COLONIES

The War Office  
The Admiralty  
The Air Ministry

The Road Board  
H.M. Office of Works  
The Port of London Authority

They are used by over 200 Public Authorities in  
THE UNITED KINGDOM

(We will gladly give you names of more than one Authority alone possessing  
12 of our Motor Rollers)

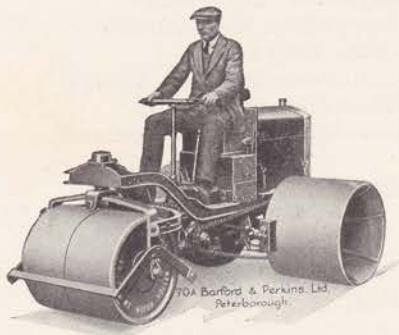
and in

Albania  
Antigua  
Argentina  
Australia  
Austria  
Azores  
Bahamas  
Barbados  
Bermuda  
Belgium  
Bosnia  
Brazil  
British East Africa  
British Guiana  
British North Borneo  
British West Indies  
Burmah  
Canada  
Canary Isles  
China  
Cochin-China  
Colombia  
Cyprus  
Denmark  
Dutch East Indies  
Egypt  
Federated Malay States

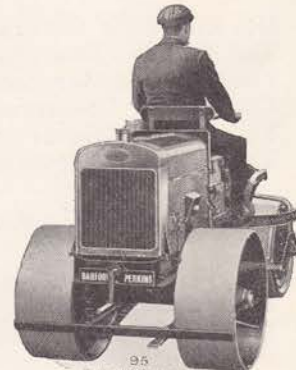
Fiji  
Finland  
France  
Germany  
Gold Coast  
Greece  
Grenada  
Holland  
Hong Kong  
Hungary  
Iceland  
India  
Indo-China  
Italy  
Jamaica  
Japan  
Java  
Leeward Isles  
Lemnos  
Malta  
Mauritius  
Mesopotamia  
Montenegro  
Morocco  
New Zealand  
Nigeria (North & South)

Norway  
Palestine  
Persia  
Peru  
Russia  
Siam  
Siberia  
Sierra Leone  
South Africa  
Spain  
Straits Settlements  
St. Vincent  
Sudan  
Sumatra  
Sweden  
Syria  
Tanganyika  
Turkey in Europe  
Turkey in Asia  
Trinidad  
Uganda  
Uruguay  
United States  
Windward Isles  
Yugo-Slavia  
Zanzibar

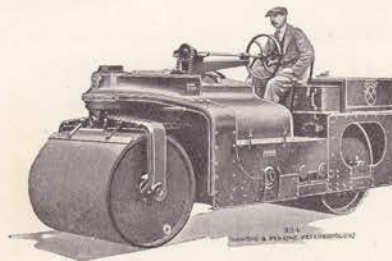
## A few Types of our Motor Rollers



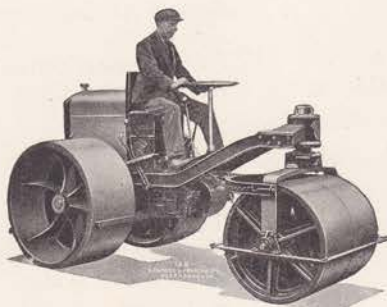
Type A3 for Grass.



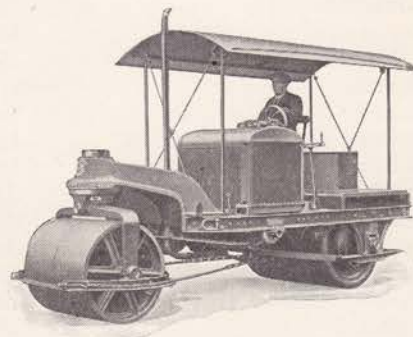
Type A for Footpaths



Q Series in Sizes 6 to 10 tons.  
Quick Reverse. Power Steering.  
For Bituminous Carpeting.



Type B, 3 and 4 tons. For light  
road-work, etc.



E Series in sizes 4 to 7 tons.  
For light road-making—particularly  
in partially developed countries.

*As the largest manufacturers we offer a more complete range than any other maker in the world. Particulars of our other publications are given inside front cover.*





# MOTOR ROAD ROLLERS

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Petrol and Paraffin Engines

---

Three-Wheel Type in  
Weights 8 to 18 Tons

Also Motor Rollers from 1½ Tons upwards of Tandem  
and Three-Wheel Design :

PETROL ENGINES,

PARAFFIN ENGINES,

HIGH - SPEED, SOLID INJECTION  
DIESEL ENGINES.

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*Largest Makers of Motor Rollers in the World.*

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(Associated with Agricultural and General Engineers, Ltd.)

*Engineers* : : PETERBOROUGH, England