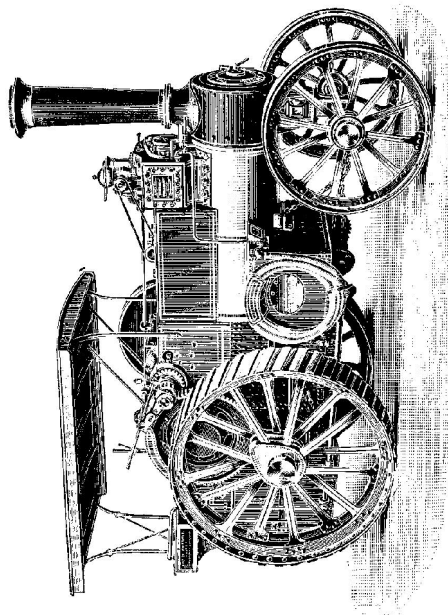
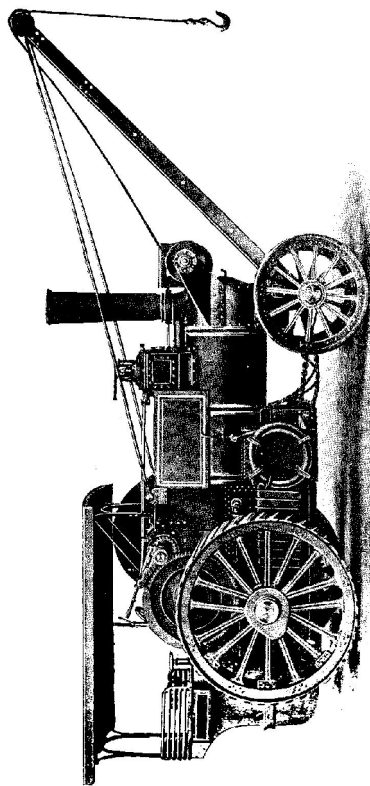


SPECIAL ROAD LOCOMOTIVE FOR
AMUSEMENT CATERERS.



ROAD LOCOMOTIVE.



ROAD LOCOMOTIVE FITTED WITH CRANE.

INSTRUCTIONS
FOR WORKING
C. BURRELL & SONS'
TRACTION ENGINES.

Filling up the Boiler. Water must be poured into the Boiler through the hole which is on the top or side of the Cylinder Casing. A proper funnel is sent for this purpose. Whilst filling the Boiler the water gauges and gauge cocks on the Boiler end should be left open, and as soon as the water reaches the bottom cock the fire may be lighted. Continue filling until the water is half way up the glass.

Lighting the Fire. Put some dry straw or shavings on the Grate Bars; cover with sticks or chips, and a slight covering of coal. Light the fire from the under side of Fire Bars, by putting lighted shavings in the Ashpan. Let the coal burn well up before adding more to the fire.

Safety Valves. Examine the Safety Valves before starting, and see that they are in working order, and ease them by raising and presing down the levers for that purpose.

While Steam is rising Carefully examine the Engine all round, to see if all the working parts, split pins, etc., are in their proper places. See that all the lubricators are filled with oil, and the teeth of the gearing well greased with tallow. Turn round the fly-wheel by hand to see if all is clear.

Starting and working. If the driver has had no previous experience with Traction Engines, he had better run in the slow gear only until he has got accustomed to working it. When thrashing or travelling on the road the Regulator or starting handle *must* be kept *full open* and the Reversing Lever *notched up* towards the centre, and by this means the amount of power is regulated for light or heavy work, and a great saving of fuel and water is effected. To get the best results as to economy it is necessary to keep the Engine well up to its full pressure, as the higher the steam is, the greater benefit is obtained by notching up from the expansion of the steam in the cylinder.

Shunting. In shunting it is better to put the reversing lever full over, or at the extreme positions, and to regulate the steam with the starting lever, as by this means the Engine can be started more steadily, and with less danger of accidents. *Never start an Engine without first looking round to see if all is clear.*

Driving a Thrashing Machine. The Engine must stand with the front end a little higher than the fire-box end, and the wheels firmly scotched, to prevent vibration. All Working parts carefully oiled, and the Tubes swept every morning. The Governors should always be used when thrashing.

Setting Engine. In Setting the Engine and Machine, they should, if possible, be fixed so that the wind blows the dust away from the Engine, and thus save trouble in cleaning.

Firing. In all cases, and especially in driving stationary machinery, the fire should be kept very thin; about three inches of bright fire evenly spread over the Grate Bars will make *more steam* than half the fire-box full of dead, black, half-burnt fire; and there will be less smoke, and less trouble, from clinkers forming on the Bars. The *corners* of the Fire-Box, particularly those at the *Fire-door end*, should be kept

well covered with fuel. The fire must not be allowed to burn off any part of the bars, or there will be a rush of cold air through the hole, which will spoil the draught, and prevent the rest of the fire from burning up. Never use the poker when the Engine is working, especially doing heavy work, as constant use of the poker causes clinkers to form, and imperfect combustion of fuel. The only time when a poker is necessary is to spread the fire if it has a tendency to become lumpy.

Before leaving off work. Before leaving off work, the driver should pump the water up two inches above the working height, and then “Blow off” about two inches of water, by opening the blow off cock. This will carry off a deal of dirt from inside the boiler, and will greatly save the fire-box; if intended to work next day, level the fire that is left on the bars and spread a thin layer of dust coal over it, close the ash-pan and fire doors, and place a sheet-iron damper on the top of the chimney. This damper should have a hole in it about an inch or inch and quarter diameter. This method has been found by experience to be much preferable to the old system of banking on the sides or corners of the fire-box. *In frosty weather the water must be run out of the feed-pipe by means of the pet-cock, also out of the pump, and the crank turned so that pump plunger is at the bottom end of its stroke.*

Cleaning out. After every two weeks' work (and oftener with dirty water) the Boiler must be properly washed out. All the mudhole doors taken off, also the mud plug in the smoke-box tube plate, and rake out as much sediments as possible. The rest should be cleaned out by a hand force pump. The manhole and mudhole doors must then be carefully replaced, and great care taken to make them steam and water-tight, as any leakage rapidly corrodes the plates. Remove the caps from Boiler clack box and *clean out the opening into the Boiler*; this may be necessary *every three months*, according to the amount of deposit which takes place at this point.

Oiling. The following parts require Oiling before starting the Engine:—Lubricators on cylinder, link motion, slide bars, governors, weighshaft, crosshead, connecting rod (both ends), eccentric bands, main crank-shaft, bearings, pump plunger and joint, counter-shaft each side, crank pinion forks, main axle bearings, compensating gear and winding drum—by pipes, road wheel bosses—hind and front, steerage spindle, and worm, and bearings front axle centre pin, and front locking carriage.

Object of Compensating Gear. The compensating gear of a Traction Engine enables it to turn corners easily, and still have both wheels driving, and avoids having to get down from the Engine to

pull out the driving pins. The action of the compensating gear is such that, in turning a corner, it allows the *outside* wheel to revolve at a greater speed than the *inside* wheel, thus taking off all undue strain from the axle.

To lock the Gear in soft places. In soft ground it is sometimes necessary to *lock the compensating gear*, in order to make both wheels perfectly rigid with the axle; to effect this take the short pin provided for this purpose and insert it into one of the bosses on double spur wheel, securing it by cottar, and if all the paddles are put on each wheel, both wheels will have the same lifting power to enable the Engine to get out of a difficulty.

To use Winding Drum. Draw the driving pins *quite out* of the left-hand road wheel boss, the drum will then be free to revolve in either direction upon the axle; then unfasten the eye of the rope, and pass it through the guide pulleys fixed on the back of the tank. The rope can thus be used for hauling a load up an incline, or winding the Threshing Machine out of places where it is not convenient to take the Engine.

To put the Pinions in gear. First move the catch to allow the pinions to slide. Pull round the flywheel by hand until the teeth are fair with one another, then pull the pinion into gear, and secure the lever by means of the safety pin. *Never take the road pinions out of gear when the Engine is standing on a hill, without first scotching the road wheels.*

To Work Injector. First see that cock in clack box next to boiler is open. Then open full water supply cock on injector. Turn on steam cock, and if injector refuses to feed, regulate the water supply cock until it feeds properly. Always keep the injector and clack box in a clean state, and wash out the tank occasionally.

To adjust the Springs. Tighten up the nuts until the pointer points to the working position on adjusting plate.

COMPOUND TRACTION ENGINES.

Require about *half* the amount of steam compared with Engines with *one* cylinder. The steam, instead of escaping at a high pressure up the chimney, is used a second time in the larger or Low Pressure Cylinder, and finally is discharged up the chimney at a pressure of about 25lbs. per square inch.

Firing. This 25lbs. pressure is all that the Boiler has to depend upon for draught, hence it follows that a *thin* fire is necessary in a Compound Engine, and the Boiler being full large for the steam it is called upon to supply, will make steam with the greatest ease.

A *thick* fire is *useless*, and will only make smoke; therefore, *fire thinly and keep the bars well covered.*

Pressure. The proper working pressure for a Compound Traction Engine is from 180 to 200 lbs. per square inch, and it is important

that the pressure be kept well up. When working with 180 lbs. the exhaust from the larger Cylinder will only be about 25 lbs., and if the Boiler pressure is dropped to 115 lbs. there will be insufficient exhaust to cause the necessary draught up the chimney, so that the Boiler will cease to do its duty. Therefore, it is important, in order to get the utmost duty out of the steam by expanding it in the Cylinders, to *keep a good head of steam under all circumstances*, and notch the Engine up with the reversing lever to suit the variations of load.

A small auxiliary starting valve is fitted close to the stop valve lever on each of our Compound Engines. This valve is not *intended for continuous use*, but is fitted for the purpose of momentarily supplying high pressure steam to the larger cylinder, so that the Engine *can be started more steadily with a load*. The use of this valve suspends the compound action for the time being, and gives the Engine immense power upon an emergency.

Remove and *clean out the Exhaust Pipe every three months*; this is necessary in Compound Engines to insure efficiency in working, as they may become choked up.

Lubrication. Our attention has been called from time to time to the *serious trouble occasioned by the use of Inferior Oil* for the Cylinders and Bearings of our Engines.

The usual results are the *cutting of Slide Valves, Pistons, and internal working parts of the Cylinders*, and the *choking up of the Steam and Exhaust Passages*, which occasions great loss of power in the Engine, as well as increased friction.

Another effect of using bad oil is the *clogging of the Lubricator Pipes* which lead the oil to the different bearings, such cloggings taking place at the points which are exposed to the highest temperature, such as the Main Axle Bearings, Counter-shaft, Crank-shaft Bearings, Fore Carriage, etc.

As soon as the oil becomes clogged the *bearings commence to score*, and although *apparently* well lubricated, *soon cut themselves to pieces and have to be renewed*.

Using We cannot too strongly impress upon
Inferior our Customers the importance of only
Oil. using *the best oil*, by which means
they will insure the utmost durability
with the least possible friction. The *best oil* is
the cheapest in the end, and it goes two or three
times as far as oil of an inferior quality.

Should any difficulty be experienced in getting good oil, we shall be glad to supply any of our customers with *the same Oils as we ourselves use* at most reasonable prices.

II

Instructions for working Mechanical Lubricator. Fix loose back-pressure valve as near as possible to the point to be lubricated. In making or re-making the pipe connections it is of the greatest importance to see that no filings or other small pieces of metal or of red lead, etc., are allowed to get in the pipe line, for the valves must be kept clean.

Having fixed lubricator, fill container with oil that has been carefully strained and nicely warmed. Remove cap of back-pressure valve above referred to, open regulating valve on oil chamber fully, and work lubricator by hand until all air is discharged from the connections, that is to say, until nothing but oil is delivered at the back-pressure valve. Replace cap of back-pressure valve and adjust feed by valve on chamber. The stroke of the ratchet lever should be arranged so that the regulating valve on chamber is open as wide as possible. Having chosen the exact stroke, however, precise regulation can be obtained by adjusting regulating valve.

A slight accumulation of oil always takes place at the bottom of the sight glass, but this is an advantage to the lubricator. If there should be too much accumulation, however, it can always be removed by turning flushing handle a few times, and regulating oil supply. Avoid letting lubricator get empty.

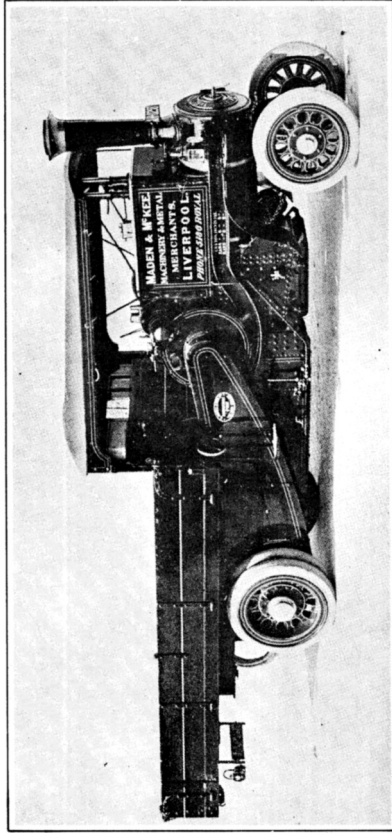
“ Stauffers ” Patent Lubricators are used in some places on our Engines, and must be replenished only with the special grease which we provide for them. **No other will do.**

TO PUT IN NEW RAMSBOTTOM PISTON RINGS ON A PISTON BODY.

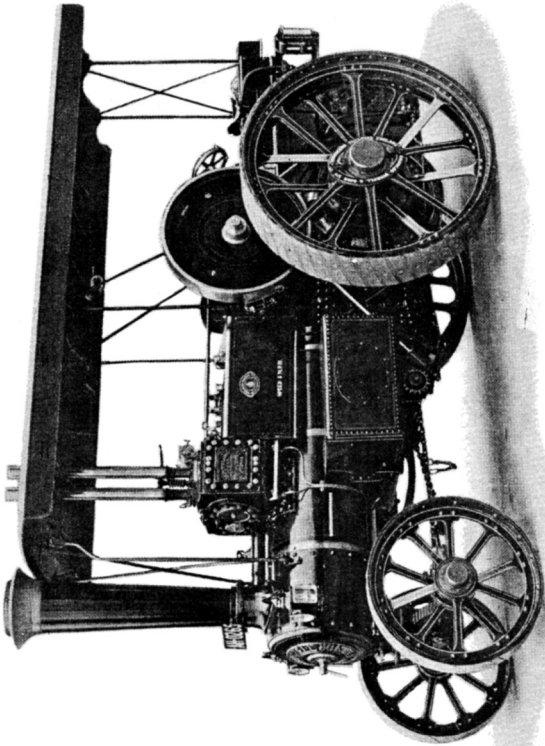
Instructions. The rings being cut in one place, can be sprung open and carefully passed on to the body of the Piston. In doing so, care must be taken to push or tap them *evenly all round*, so that there is as little twist as possible on them; this can be guarded against by keeping the cut ends always in line, or nearly so. A ring, if put on in this manner, will drop into its groove simultaneously all round.

WHEN ENGINES ARE FITTED WITH OUR PATENT ARRANGEMENT FOR LOCKING THE DIFFERENTIAL MOTION.

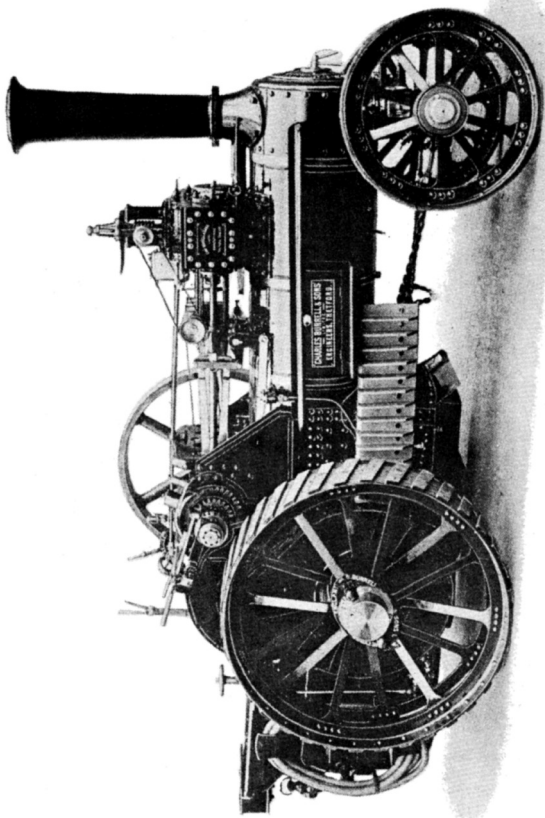
Should either of the hind wheels at any time refuse to grip the road when travelling, lock the differential motion by means of a handle provided for that purpose by pushing it towards outside of engine, making it fast by pin. This may be used with safety at any time when engine is travelling on a straight road, but should never in any case be used when turning a corner.



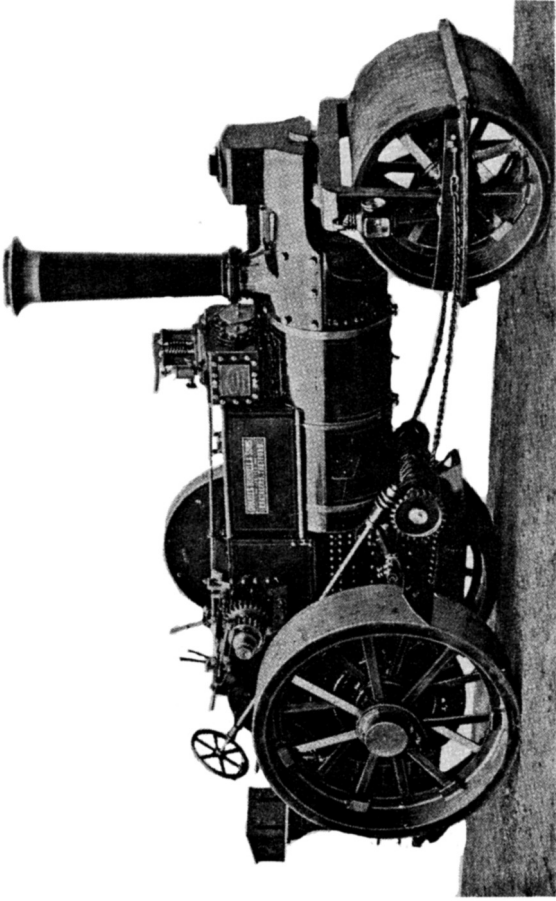
STEAM WAGON FITTED WITH RUBBER TYRES.



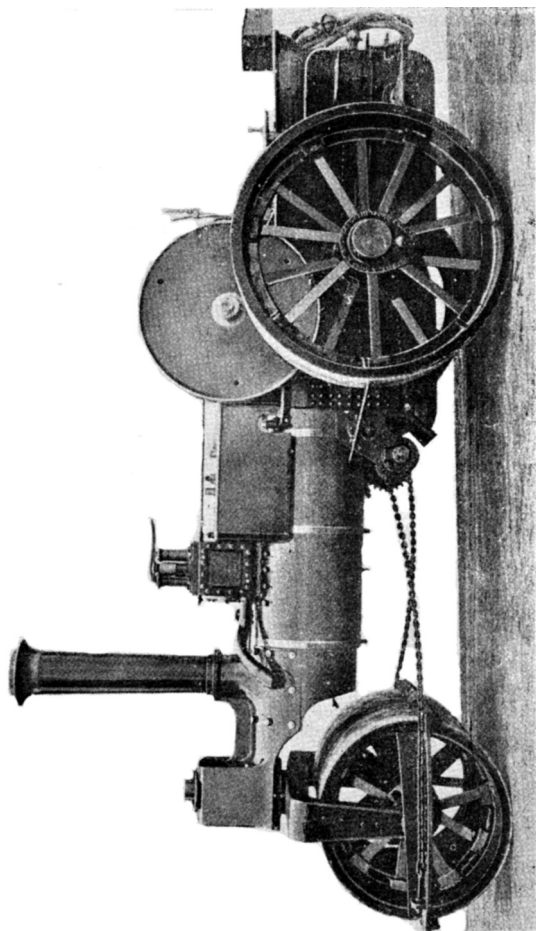
COLD MEDAL TRACTOR.



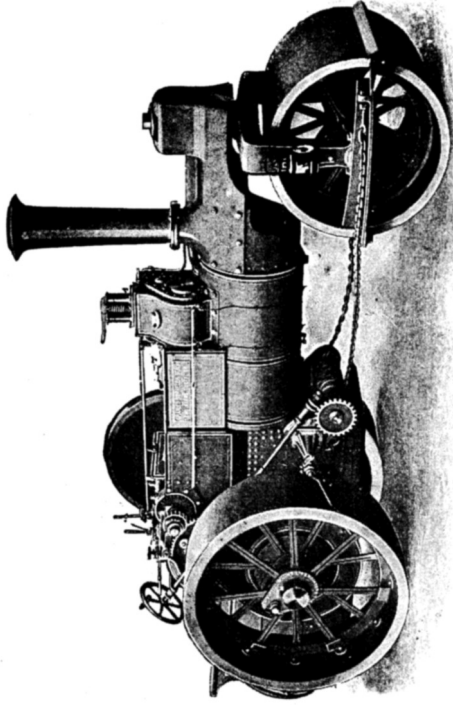
TRACTION ENGINE.



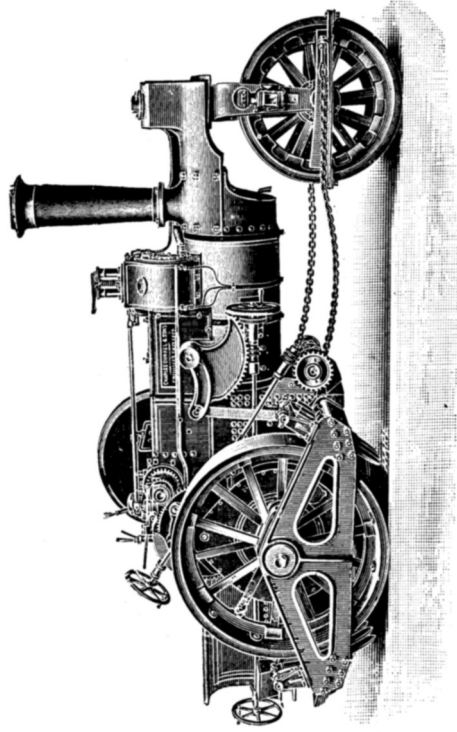
ROAD ROLLER (DOUBLE CRANK COMPOUND)



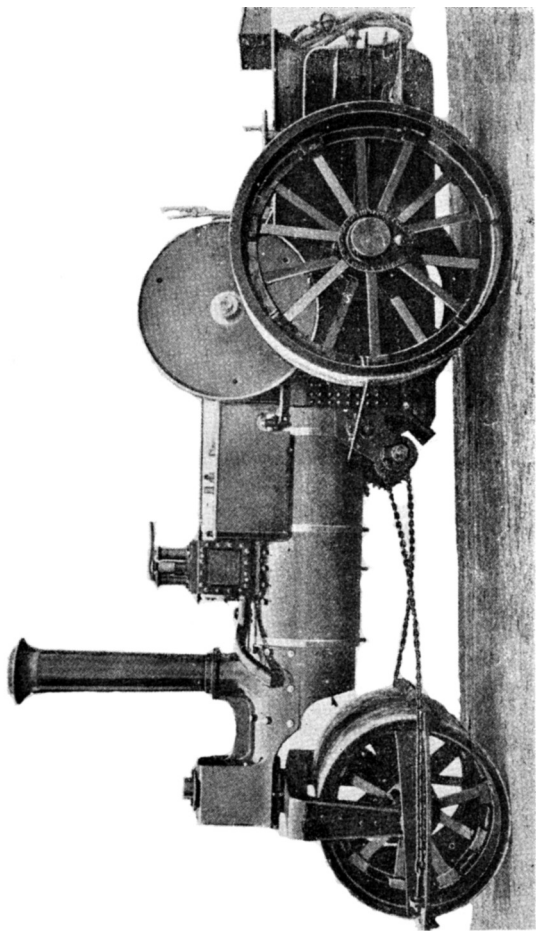
ROAD ROLLER (SINGLE CYLINDER).



ROAD ROLLER SINGLE CRANK COMPOUND).



ROAD ROLLER FITTED WITH SCARIFIER.



ROAD ROLLER (SINGLE CYLINDER).

INSTRUCTIONS FOR WORKING
C. BURRELL & SONS' L.P.
TRACTION ENGINES

1916