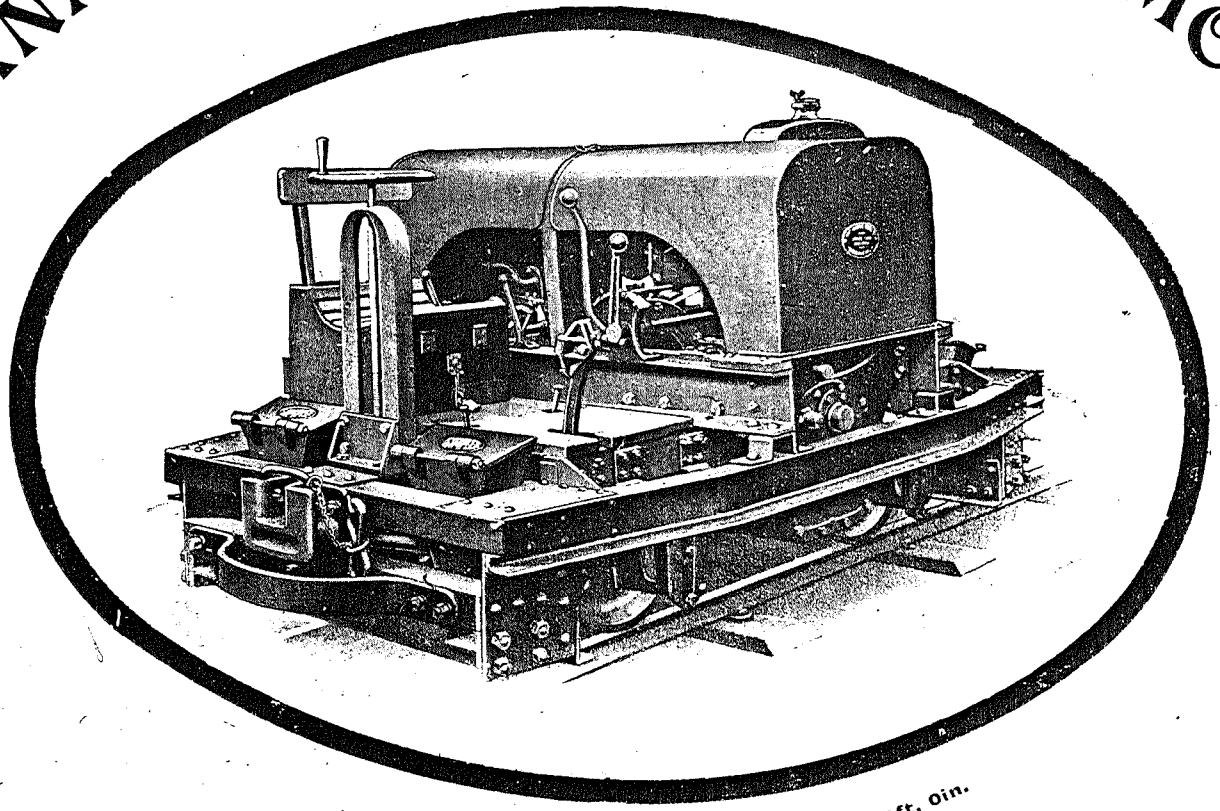
8200

SIMPLEX

INTERNAL COMBUSTION LOCOMOTIVES

INSTRUCTION BOOK.

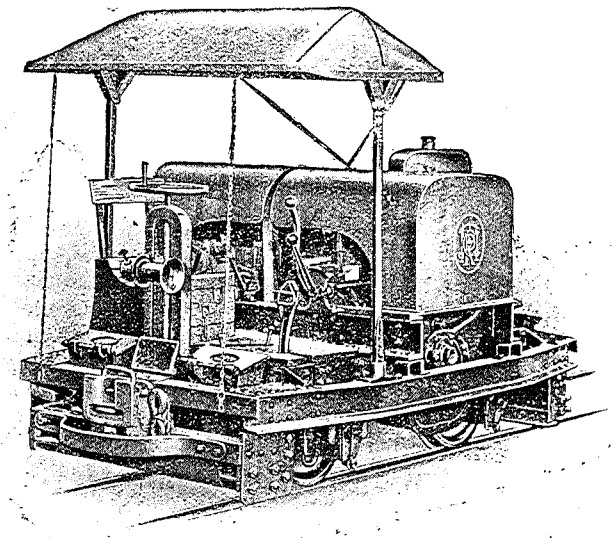


20 H.P. 2½ TON TYPE—GAUGES 1ft. 3in. to 2ft. 0in.

MOTOR RAIL LTD Light Railway Engineers,

SIMPLEX WORKS, BEDFORD, ENGLAND.

Telegrams & Cables: "SIMPLEX," BEDFORD.
~~Telephone: BEDFORD 2110~~
Codes: ABC ENGINEERING 6th EDITION and BENTLEYS



20 B.H.P. SIMPLEX LOCOMOTIVE WITH AWNING

WORKING INSTRUCTIONS.

Driving.

FIRST CARE.

See that the Radiator is full of clean water and the Petrol Tank is amply supplied with fuel.

Make sure that the Engine crank-case has plenty of oil. The green on the oil indicator indicates a sufficient supply, the red above the green indicates danger, *i.e.*, "too much oil," the red below the green also indicates danger, *i.e.*, "too little oil."

supply, the red above the green indicates danger, *i.e.* "too much oil," the red below the green also indicates danger, *i.e.* "too little oil."

Fill all grease cups.

Make certain that the brakes fall clear of the wheels, because if a portion of the line is submerged, they may become clogged with dirt, also see that they "pull on" with some screw to spare, if not tighten up the turn buckle on the pull rod between the axles.

Fill the sandboxes and try the operating gear to make certain of their working all right, should they be clogged with damp sand open the sand box lid and pass a wire through the opening at the top of the valve right down through the spout.

Have a good look round the Locomotive and tighten up any bolts that may appear slack. If working in a dusty district, slack bolts can easily be detected by a dark line at the base of the nut where the slack bolt or nut has rubbed away the dust.

STARTING UP THE ENGINE.

If you are satisfied that everything is right for starting up the Engine, then proceed as follows :—

Turn on the Petrol, flood the Carburettor, and don't forget the switch.

Retard the Magneto, open the throttle very slightly and swing the starting handle with a good smart turn and the Engine will start.

If the throttle lever is open the correct amount, a gurgling suck will be quite audible. This is the slow-running tube of the Carburettor sucking up Petrol from the "little well" which is provided for easy starting.

The correct position to stand when "cranking" the starting handle is behind the starting handle facing the seat back, with your left knee close to the Locomotive and just clear of the starting handle. Place your right leg well in front and away from the Locomotive. From the foregoing position you can use both hands without fear of over-balancing, and the job becomes simple. If the weather is very cold it will assist in making starting-up easier if you drop a little Petrol through the Compression Taps.

Once the Engine is started allow it to run for a minute or two until thoroughly warmed up.

When running, advance the magneto lever about one-third the distance of the quadrant.

GETTING YOUR FIRST SPEED.

Release the Brakes, depress the Clutch Pedal, and throw in your low gear or 1st speed by pulling the change speed handle towards you.

Select your direction of travel by putting the reverse lever against the correct arrow. Gently raise your Clutch Pedal and at the same time gradually open throttle lever when the train will commence to move.

Continue opening the Throttle gradually until the train is running at approximately 3 miles per hour.

GETTING YOUR 2nd SPEED.

With the train or Locomotive running at the foregoing speed and providing that the load is not unduly heavy, and the grade of the track too steep you can now change your speed as follows :—

Close down the throttle and depress the clutch pedal about half-way, then immediately move the change speed handle smartly to the central position then,

Depress the clutch pedal right home and after 2 or 3 seconds push the change speed handle forward quickly, thus engaging your high gear.

Raise your clutch pedal and open the throttle, regulating the speed of the train by either steadily opening or shutting the same.

The stumbling block of the novice who has never driven a motor car, is to successfully engage a 2nd speed gear when he pushes forward his change speed handle. The scheme is to slow the clutch cone down sufficiently by pressing home the clutch pedal before attempting to engage from the central position to the 2nd speed position.

On the other hand if it is delayed too long the clutch cone will stop entirely and the results will not be satisfactory.

The feel of the levers will be quickly found if the operator will watch, or get another to watch the clutch cone, to ascertain whether he stops it too much or otherwise. No great force is required, for if applied it places heavy wear on this part of the Locomotive.

MAGNETO ADVANCE.

As the speed of the train increases, advance the Magneto Lever, but not to such a position as will cause the engine to knock.

It is a good practice to keep the Magneto lever as far advanced as possible without producing the knock referred to.

CLIMBING A GRADIENT.

If about to negotiate a gradient and you find the speed of the train decreasing it will be necessary to change over from the high speed gear to the low; it should be done as follows :

FROM 2nd SPEED TO 1st.

Close down the Throttle about one quarter way depressing the clutch pedal slightly at the same time,

immediately pull the change speed lever over from the high to central or neutral position. Let the clutch in for a second, then depress again, and engage the slow or first speed by pulling the change speed lever towards you, smartly. Raise clutch pedal and open the throttle as required.

The reason for this method of "double clutching" is to allow the clutch cone, which is connected with the driving shaft of the gear box, to increase in speed, in order to engage without jar, the first speed gear. Whilst this practice is by no means in general use, it is invariably adopted by the first class driver as it is found to be very beneficial, not only to Simplex locomotives but also to any motor car which may have to be handled.

ROUNDING A CURVE.

When about to negotiate a sharp curve, slow up on the speed of the train otherwise derailment may occur.

If there be any doubt as to whether the train will take its load round the curve on its high gear, slow down to about 4 miles per hour, before entering the curve and change from the high to the low gear, as already described.

RUNNING DOWN HILL.

When descending a gradient shut down the throttle, and if this does not reduce the speed sufficiently, apply your brakes.

Should the train be exceptionally heavy take care to reduce your speed before reaching the gradient, otherwise you may find the train getting out of control.

WHEN REVERSING.

Before endeavouring to reverse, declutch by pressing the clutch pedal, and pause a second or two, pull over the reverse lever to the position as shewn on the quadrant and then re-engage on the clutch by raising the pedal.

STOPPING.

To stop the train, close throttle, declutch and place change speed lever to the neutral position, applying brakes as required.

Don't jam the brakes hard or the wheels will skid.

Best braking effects are obtained just before skidding commences, if necessary brake effect can be increased by applying sand to the rails.

STANDING BY.

Always take advantage of stops to see if your supply of water in the radiator and fuel in the petrol tanks is sufficient to "get home" again.

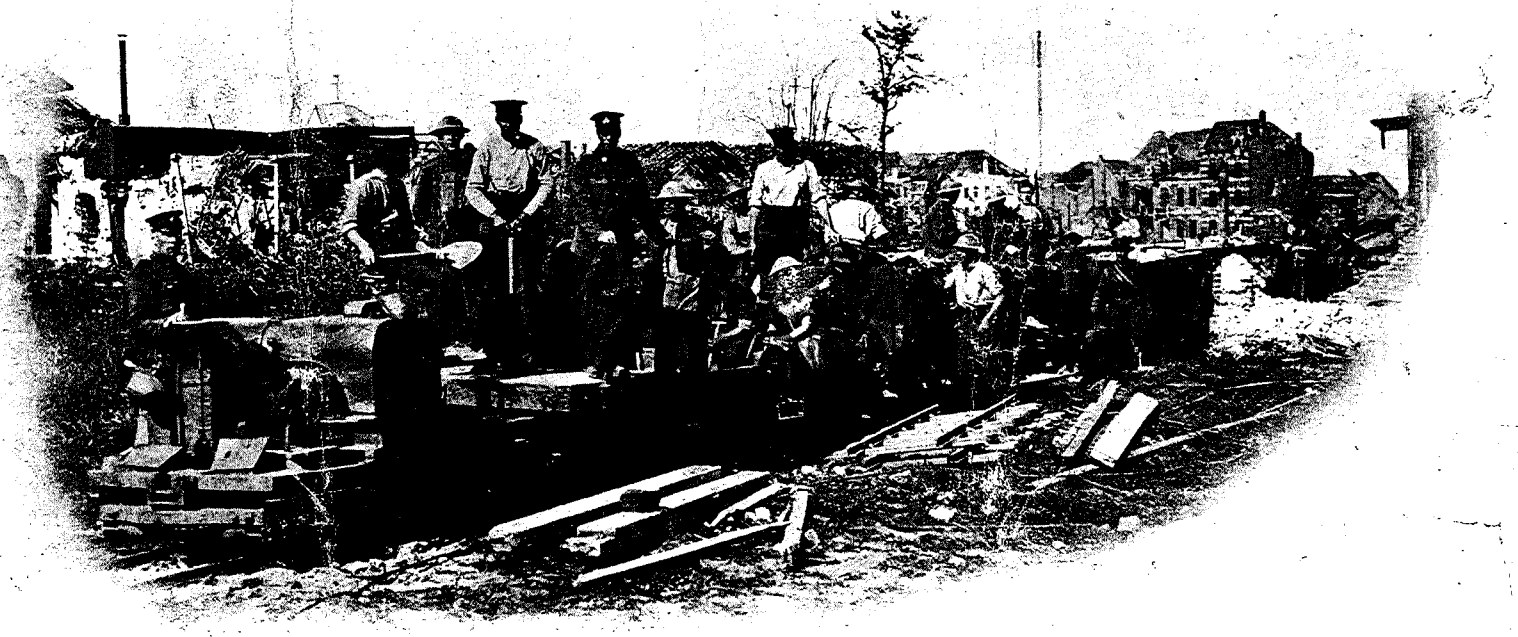
Take note of the oil in the Engine crank-case and feel your axle bearings to see that they are not running hot. Watch out for loose nuts, pins, etc.

SHUTTING DOWN.

At the end of the day, when shutting down for the night it is only necessary to switch off and close the Petrol cock and put the brakes on. If there is any likelihood of the temperature of the shed, in which the Locomotive is housed, getting down to freezing point, the water must be thoroughly drained from every part of the cooling system.

To do this, open the two main cocks, one underneath the Radiator and the other underneath the water pump. Then open the Water Jacket Drain Cock on the Cylinder. On the 20 h.p. Locomotive this drain cock is situated on the cylinder itself and on the 40 h.p. it will be found underneath the water inlet pipe between the two cylinders. It is also advisable to open the pet cock of the water pump itself. It is essential that the foregoing instructions be thoroughly carried out. All pockets of water formed in the cylinders and pump should be drained, otherwise freezing may take place and perhaps crack the cylinders. Should the water freeze in the pump the propeller would be frozen to the casing and thus prevent starting up.

PORTION OF A WEEK'S OUTPUT SHEWING 40 H.P. WEATHER PROTECTED TYPE SIMPLEX PETROL LOCOMOTIVES.



Canadians passing through a Ruined Town after Laying a Track
(Canadian Official Photograph)

Starting Troubles and "How to Beat Them."

WHERE TO FIND THEM.

Should the Engine refuse to start you may be sure that there is a reason for this and when discovered will probably be found quite a simple one. Generally speaking, the trouble will be located either in the Ignition (magneto and spark plug circuit) or in the fuel supply (Carburettor and Petrol Tank Service).

FUEL SERVICE.

Overhaul your fuel supply, first by examining the Petrol Tank and making sure that a supply of fuel is on hand. Try the Petrol cock to make sure that it is open. Examine the Strainer and see that it is free from any

obstruction which may prevent the petrol from reaching the carburettor. Take note if the float is working properly in the Carburettor and that no difficulty exists in flooding it with petrol.

After having tried to get the engine going with the throttle handle a "little more" or a "little less" open, if the Engine still refuses to start, then turn your attention to the

IGNITION SYSTEM

See that the switch is on. Remove the sparking plugs from the cylinders and note if the points are free from carbon or soot. Examine the gap between the 2 points of the sparks and if necessary adjust the points so that the distance between them is say, 1/32 of an inch. Place sparking plugs on the cylinders with the wire attached to the Magneto, taking care that the heads of the Plugs, or the uninsulated ends of the high tension wires do not touch any metal.

Swing the engine round sharply and watch if a bright spark occurs at the points of the 2 plugs. If good healthy sparks are obtained replace the plugs in the cylinders, first squirting a few drops of petrol through the plug holes; the Engine should then start without further trouble after the first one or two turns.

Should you find that no spark occurs at the Plugs, the Magneto should be examined by a qualified mechanic and adjusted accordingly.

It is not advisable that the magneto should be interfered with by anyone unless they have an intimate knowledge of its principles and construction.

Our strong advice is "If you don't worry the Magneto, it won't worry you."

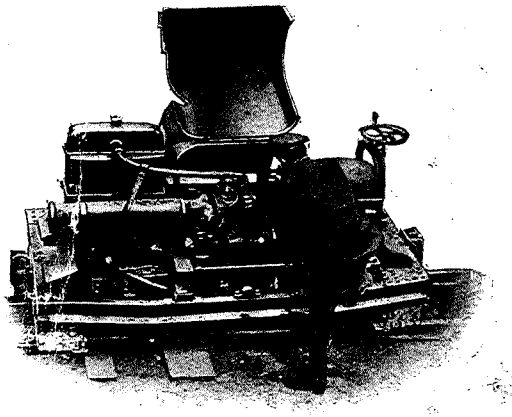
Sometimes starting troubles are occasioned by one of the Exhaust or Inlet Valves being hung up. This can be easily detected by the ease with which you can swing the engine round, indicating loss of compression.

Remove the valve cover by wing nut. The remedy is then, to oil the valve guides and work the valve up and down a few times with a lever.

In the event of the Engine refusing to start, even when it is thoroughly warmed up from recent working, and the Carburettor has been flooded (this should not be necessary if the Engine is heated) you may have set up the condition of having too much petrol vapour in proportion to the air; resulting in your cylinders being filled with a non-explosive mixture. If this be suspected, take out the spark plugs and turn the Engine smartly round several times (at the same time see that the plugs are sparking) replace the plugs and again start up; this cleans out the rich gas which is non-explosive. The same result can be obtained by opening the compression cocks, but removing the plugs is more effective.

HINTS ON MAINTENANCE.

With reasonable care and attention the Locomotive should be capable of doing its work for a considerable length of time before requiring an overhaul.



As the engine represents the prime component part of the Locomotive it is essential that it should receive perhaps a little more attention than the remainder of the machine. Experience alone can bring under notice the many items, which, if given attention from day to day will save possible troubles. It is difficult to conjure up all the combinations possible, which may from time to time result in a temporary stoppage. The cure for most engine troubles can be found in cleanliness, good lubrication, ignition and carburettor adjustments respectively. If the four items mentioned are kept up to proper working conditions, the Locomotive can be depended upon to give a good account of itself. In the 20hp. the Engine has two cylinders each 120 m/m in diameter by 140 m/m stroke, whilst the 40hp. Locomotive has four cylinders of the same dimensions. The 20hp. Engines have a maximum speed of 1,800 revs. per minute and a normal speed of 1,000 revs. per minute. It can be controlled down to 250 revs.

The 40hp. Engine's maximum speed is 1,500 and normal 1,000 revs. per minute, and controlled to 250.

The figures given can be accepted as a guide to the driver in determining if his engine is "up to the mark."

If the engines are working at the revolutions mentioned in the 20hp. on top gear, speeds should range from 14.8 to 2.06 miles per hour.

With the low gear, the travelling speed can be varied from 6.1 to one mile per hour.

With the 40hp. Locomotive the top speed is 12.5 miles per hour on the high gear (2nd speed) and one mile per hour on the low gear (1st speed). The speeds can be obtained with the Locomotive travelling in either direction.

It should be noted that all the load carrying shafts are parallel to one another. The Engine Crankshaft is direct coupled through the Clutch, to the first Gear Shaft of the Gear Box. The remaining shafts in the Gear Box being parallel thereto, and the driving axles are parallel to all the other shafts.

From this it will be seen that there is no cardan shaft with its universal joint, which invariably gives trouble, neither is there any loss by the transmission of power through bevel or worm gearing, which would reduce the efficiency of the Locomotive.

LUBRICATION

Lubrication is a very important item for consideration. A defective lubricating system will lead to serious engine troubles. See that the Engine Crankcase is kept filled to its proper level *(see page 2)*. Buy good quality oil for the purpose. Should there be any difficulty in obtaining proper supplies, we shall be pleased to supply an oil which can be recommended. There is no economy in purchasing a cheap oil, as they invariably prove the most expensive in the long run.

A brief description of the lubricating system will assist towards its being kept in proper working order.

A Rotary Oil Pump in the bottom of the Crankcase driven by skew gears from the Cam shaft. This pump

delivers the oil under pressure to the main Crankshaft bearings, any surplus being allowed to escape through a relief valve to the skew gears which drive the water pump and the magneto.

The oil which is forced into the mainshaft bearings is carried down the crankshaft through drilled ducts or channels to the big ends, from where a certain amount of oil is thrown off by the centrifugal force, and serves to lubricate the Cylinder Walls and Gudgeon Pins. To make sure of clean oil, a Filter is provided, through which all the oil handled by the pump has to pass.

In the case of the 20hp. Locomotives, this filter can be removed by slackening the 2 Thumb Screws on the Crank case. Twist the filter head and it will spring out. This filter should be withdrawn every 3 days for cleaning. Although the Filter is below the level of the oil, when it is removed a valve automatically springs into position which cuts off the oil and prevents it escaping from the crank case.

With the 40hp. Locomotives the filter is arranged as a false bottom in the crankcase covering its whole extent, and therefore cannot get clogged up, and requires no attention whatsoever.

The oil should be drained by the oil bung or plug in the bottom of the crankcase, every month or so, according to the length of time the Engine has been working, and fresh oil substituted. It is a common practise to pour the oil from the crankcase, after allowing the sediment to settle, into the gear box, where it would be found quite suitable, provided always it is free from any foreign matter.

There is little need to worry about the oil pump, unless it is found that there is no oil coming through the test-cock when the engine is running. This test oil cock will be found at the side of the crankcase and if the pump is working properly it will squirt oil out immediately the cock is opened for a moment, and it is always advisable to apply this test from time to time. We cannot emphasize too strongly the necessity of keeping an eye on the lubrication system, both by trying the test cock occasionally and also watching the oil level indicator. With experience you will know instinctively by the hum of the Engine if the system is in proper working order.

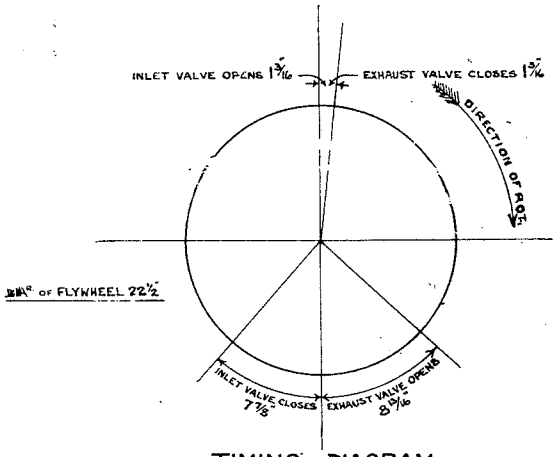
VALVES.

Good compression assists towards making a good Engine and good compression means good Valves. Let the valves once begin to lose their tightness and the power of the Engine come down with a jump. The valves on the Engine are interchangeable, that is, both exhaust and inlet are identical, likewise all springs and fittings. This is a convenience when spare parts are considered and saves complications arising. Always see that the Valves are moving freely in the Valve Guides and are getting home to rest every time after being lifted. Sometimes they "hang up" through becoming overheated or burnt oil may have been deposited on the valve stem adding undue friction. If this happens it is only a matter of a few minutes to take the valve out, clean and replace it.

The valve lifters should be kept 4/1,000th part of an inch clear of the valve stems when they are at rest. These dimensions are approximately equal to the thickness of a piece of thick writing paper.

If you find the Engine losing power it may be due to the Valves not seating properly, thus reducing compression. Remove the Valves and note whether the Valve Seat shows an unbroken surface all round. If a speck or mark occurs in the circle it must be removed by grinding in the valve. This is done with a mixture of oil and knife powder, or a regular valve grinding compound which can now-a-days be obtained in most places.

Should the Valves require "Timing" at any time the accompanying illustration gives the correct setting in relation to the fly wheel and crank-shaft. At the points laid down—by the figures given—the respective Valves should be "just" beginning to open or close as the case may be.



22½° OF FLYWHEEL 22½

TIMING DIAGRAM.

WATER CIRCULATION.

The Engine Cylinders are kept cool by means of water jackets which are cast round each pair of cylinders. This water in its transit picks up considerable heat which is removed by the Radiator through which the water is forced by a Centrifugal Pump driven from the cross shaft on the Engine.

The pump forces the water through the Cylinders thence to the top of the Radiator through which it passes, being cooled on the way, leaving the Radiator at the bottom and again returning to the Pump, where the process is repeated.

To assist the radiator in its functions a Fan is provided driven off the rear end of the cam-shaft by a belt. This Fan is constantly forcing a current of air against the radiator tubes which serves to carry off the heat deposited there by the circulating water.

It will be necessary to tighten the gland nut of the water pump occasionally when the water begins to weep through the gland, but should it be found that the gland is screwed right home without preventing the water from escaping, it is evident that the pump spindle needs repacking.

Given that the water does not reach boiling point no trouble will be experienced with the running of the Engine and in fact just below boiling point is the temperature to aim at. If by any means the water does boil, no harm can be done provided there is a sufficiency of water which can be seen from the Radiator Cap when it is removed.

When boiling does take place it results in considerable evaporation of the water and it would not be long before having to fill up again. Should there be no apparent reason for the water boiling, such as climbing a long hill with a very heavy load, there is doubtless some other cause to look for. It may be that the Fan is not working properly and the belt slipping or the centrifugal pump not passing the required quantity of water through owing to dirt in the water; or again, perhaps, the Engine has been running at top speed with the ignition fully retarded by mistake.

Leaky valves, faulty lubrication, or running with the brakes on, all of these will tend to bring about over-heating

of the Engine. It can always be accepted as a certainty that there is some tangible reason for the water boiling in-as-much as ample surface is provided in the Radiator for dealing with the circulating water and when trouble does occur in this direction it is advisable to look into the matter without delay.

In cases where the Engine has been running for sometime on a short or boiling water supply and the Engine Cylinder Jackets have been unduly heated don't on any account start up again with cold water, if you do, probably a cracked water jacket will result. Ease the temperature of the water down gradually so that no excessive contractions takes place on the Cylinders. It is not uncommon to find the Engine very difficult to swing round, after being run on short water. This is due to the Cylinders and Pistons having become over-heated and probably the lubricating oil has been carbonised thereby increasing friction. A little Kerosene injected into the Cylinders through the Sparking Plug holes will rectify this trouble, swinging the Engine several times, with the Plugs out.

Provision is made for tightening the belt driving the Fan, and it is advisable that the belt should not be pulled more taut than is necessary.

CARBURETTOR.

The Carburettor is of the well-known Zenith Horizontal type provided with 2 jets, *i.e.*, one for running at normal speed and another which is immersed in a little well of petrol to facilitate starting and slow running.

The principles of the Carburettor is that when the Carburettor Throttle is closed, the Auxiliary or Starting and Slow running jet is brought into operation, and as the throttle valve is opened this jet is gradually cut out and the main jet brought into action.

A Screwed Down Tap and Petrol Filter is introduced and fitted between the Petrol Tank and the Carbruettor. It is advisable that the Filter should be examined from time to time and thoroughly cleaned as this Filter is fitted with very fine gauze to intercept every particle of dirt. The Filter is so constructed that it also becomes a water trap to catch any drops of water that may have got into the Petrol Tank.

It has been known on more than one occasion for a driver to give his locomotive up as hopeless, simply because the Petrol Filter has done its duty by catching dirt poured in with the Petrol, and in consequence has become choked up. If the instructions given on "Starting Troubles" are properly followed you will automatically act against this difficulty.

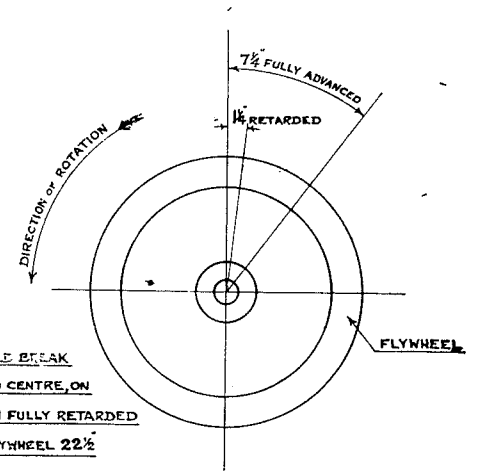
IGNITION.

The Ignition is taken care of by the High Tension Magneto which is driven from the cross-shaft on the Engine and coupled there-to by a flexible coupling. This Magneto is provided with a distributor from which one high Tension Wire is taken to each sparking Plug. Should it be necessary at any time to remove the magneto from the driving shaft be very careful to note the position of the fly-wheel on the Engine and see also, that the respective halves of the Magneto Coupling are marked. The coupling is so arranged that the magneto can be set by screwing or unscrewing the bolt on the Engine side of the Coupling, this works a thread, cut in the shaft, and rotates the

coupling backwards and forwards as desired on the shaft. The failure of the foregoing precautions often leads to considerable trouble, and it will then be necessary for you to retime the magneto, in accordance with the timing diagram shown herewith.

To use this diagram, first find the top dead centre of No. 1 Cylinder which you will see is marked on the fly-wheel. Bring this line to the top of the fly-wheel, then move the fly-wheel backwards 1¼ inches. Retard the Magneto and then set same so that the gap of the contact breaker is just opening at this point.

The method of testing the Magneto for sparking has already been explained and we again repeat our recommendation that the Magneto should not be taken adrift except by someone who understands the work.



MAGNETO SETTING.

CLUTCH.

The friction clutch is situated on the fly-wheel between the engine and the gearbox and serves to smoothly engage or disengage the engine from the road wheels of the locomotive. It is of the inverted cone type lined with "ferodo" (a non-inflammable asbestos fabric) copper bonded.

The whole comfort of driving depends upon the adjustment of the Clutch Backstops, mounted on the Clutch Rocking shaft, and fixed thereto with split ended bosses, held in place by tightening the bolt on the boss. These Backstops, which are also lined with "ferodo," engage on the face of the clutch spider, so that when the clutch pedal is depressed, the clutch spider is first quite free, and then when the clutch pedal is further depressed, the backstop pads comes into play and retard the spinning of the spider, so that the change speed gears can be conveniently engaged.

These Backstops can be adjusted to suit the individual taste of the driver, and also to take up resultant wear. Adjustment in these items is generally found to require a little more attention at first until such time as the ferodo on the Cone and on the Pads has been well worked in.

When the foot is resting lightly on the Clutch Pedal, the correct position for these pads is that they should be $^3/_{16}$" to $\frac{1}{4}$" away from the face of the Clutch Cone. This will allow for when the Clutch is freed by depressing the Clutch Pedal, so that the Backstops are just free on the Cone, and when the Clutch Pedal is further depressed, owing to the difference in the length of the levers, the Backstops will catch up the Clutch Cone, and press on the Cone, thus retarding its spinning, and permitting of the change speed to be carried through without unnecessary force or jar.

As already indicated a little trouble taken to adjust the Backstops to suit the drivers, will assist towards making the days' work easier.

In the course of time as the Clutch wears it will be found that the pedal will work forward or gradually take a

position nearer the driver. This can be adjusted by slackening the bolts, gripping the clutch toggles (or clutch jockey levers as they are sometimes called) resetting the Clutch Pedal and tighten up. When this operation becomes necessary it is then essential that the Backstop levers should be reset as described above. The two Grease Cups on the Clutch should be replenished every working day.

GEAR BOX.

The "Dixon-Abbott" patent gear box is a self-contained unit, totally enclosed and running in ordinary lubricating oil. It consists of a special formation of accurately machined and very strong spur gears, engaged by means of a form of dog clutches. It is operated by 2 levers. One the reverse lever, which is only used for reversing, and should be operated by placing the same opposite the arrow indicating direction in which it is desired to travel. The second lever is the change speed lever and has three positions, viz.: low gear, neutral, and top gear. The Gear Box gives two speeds in both directions. It is advisable to open the inspection cover of the Gear Box every 2 months to ascertain if further oil is required. The correct level of the oil is when it is just touching the bottom of the lower shaft. Many Gear Boxes of this type have run for 7 years without any attention. There is only one bush in the whole combination, the remainder of the journals being of the ball and roller type, and the bush mentioned is only working at relatively very low speeds.

CHAIN DRIVE.

On the lower shaft of the gear box is mounted the double Chain Pinion Wheel over which one chain passes to each road axle, on which are likewise mounted Sprocket Wheels.

Spring tension rods are fitted to each Axle Box which serve both to relieve the strain on the chains in the case of sudden start or jerk, and also serve to adjust the chains as they stretch. To do this slack back all lock nuts and tighten up the outside nuts until the required tightness is attained, taking care to keep the axles parallel, which can be tested by the distance between the axle boxes and their adjacent horn plates. When the desired tension is obtained, tighten up the inner nuts, so that the tension of the spring comes on the nuts and not constantly on the chain, then tighten all lock nuts.

AXLE BOXES.

The Axle Boxes on the Locomotive driving axles are in accordance with those invariably specified with the best steam Locomotive practice. To open cover, slack back the nut as far as split pin, but no further. The spring may then be pushed aside and the cover removed.

The Boxes are adapted for oil lubrication, it being only necessary to pour oil through the front cover into the base. The lubricating pads or wicks absorbing the oil and the pads in turn are pressed by springs against the journals. The complete wick can be pressed down and removed through the front of the cover at any time. To remove the journal bearings, *i.e.* the Axle Box bearings, jack up the frame a couple of inches, pull out the key plate

on the top of the bearings, then lift the bearings half-an-inch and remove it. The operation is simple and obviates the necessity of taking the axleboxes to pieces. New bearings can be inserted by the same procedure.

BRAKE GEAR.

This is of the usual Locomotive screw down type. When requiring adjustment, remove the seat which will permit of your getting at the nut on the pull rod, slacken this nut and tighten up the turn buckle. As the turn buckle is close to the ground and is probably coated with dust or mud, clean it first with paraffin (Kerosine) to make adjustment easy.

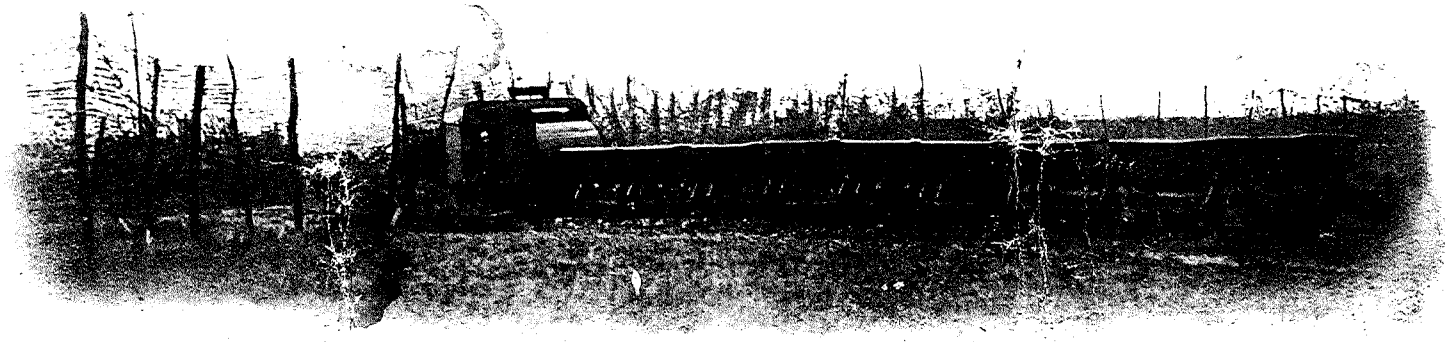
To renew Brake Blocks it is only necessary to remove the nut at the end of the brake cross bar, pull off the old block and push on the new one. When replacing the nut which holds the block in position do not forget to first insert the spring washer.

ACCESSIBILITY.

It will be found that both the 20hp. and 40hp. Locomotives respectively afford excellent opportunity to get at any wearing parts for adjustment or renewal. We claim in this respect that the Simplex Locomotive stands pre-eminent amongst all others, all parts being easily accessible from the top. If it be desired to remove the seat and platform at any time, draw the whole arrangement back $\frac{1}{2}''$ and then lift vertically. This when removed will lay open for inspection nearly all the underneath working parts.

SLINGING.

When lifting Locomotives off and on Railway Trucks they should be slung from the 4 corners of the Frame, care being taken that the slings are so arranged that they do not damage any parts of the Engine, Radiator, etc., when the weight comes on them.



A CANADIAN LIGHT RAILWAY TRAIN PASSING THROUGH CAMOUFLAGE NEAR LOOS
(Canadian Official Photograph)