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THE ROYAL ENFIELD WORKS REDDITCH.



*The Book of the*  
**ROYAL ENFIELD**  
**SIDE-CAR COMBINATION**

*A Handbook published for the  
use and assistance of owners of  
Royal Enfield Side-Car Com-  
binations. This book embodies  
in a clear and concise form the  
advice and suggestions of the  
manufacturers' technical staff,  
together with a Price List of  
Spare and Replacement Parts.*

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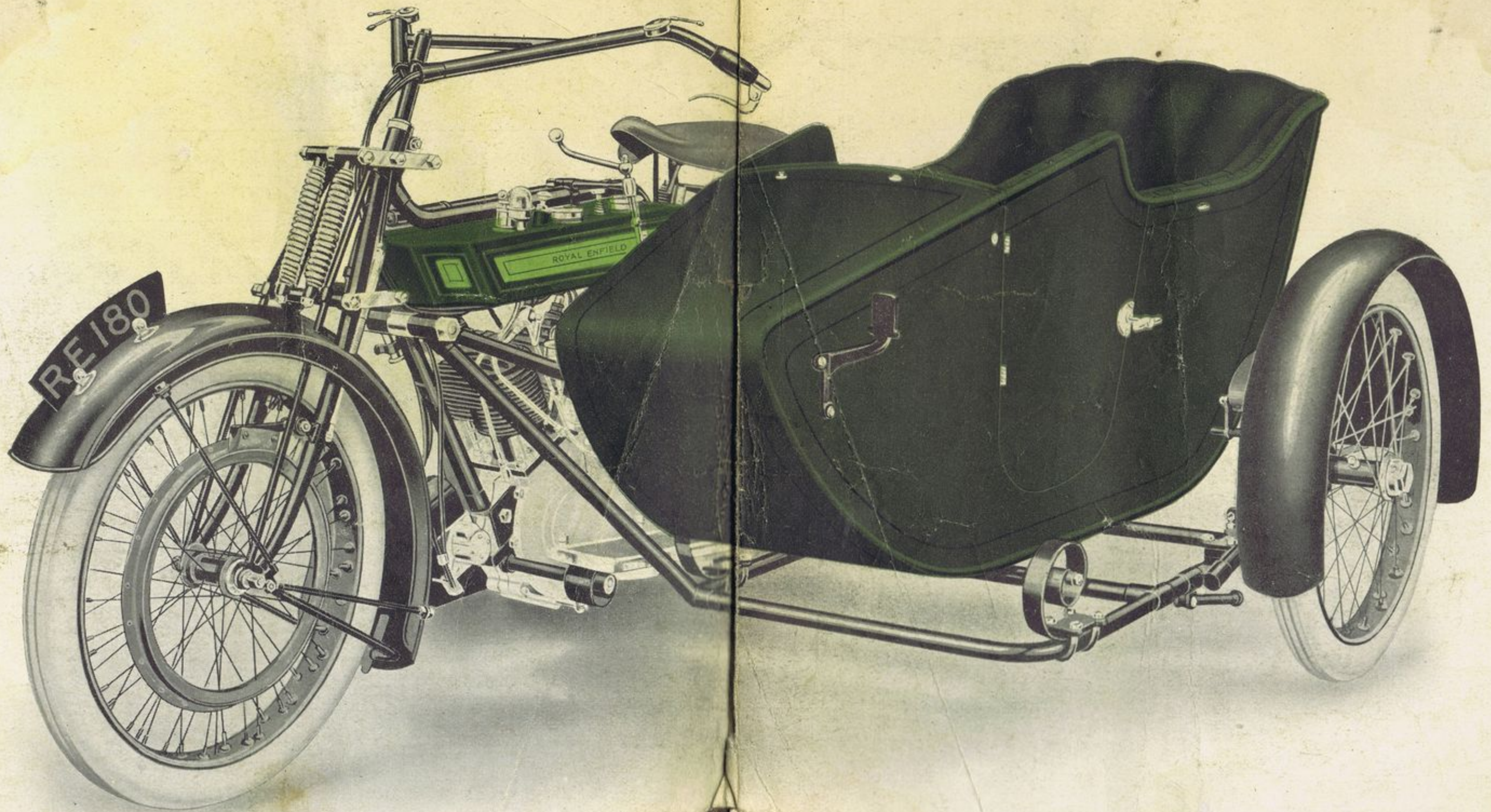


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THE 6 H.P. ROYAL ENFIELD SIDE-CAR COMBINATION.

MODEL No. 180



# THE ROYAL ENFIELD SIDE-CAR COMBINATION

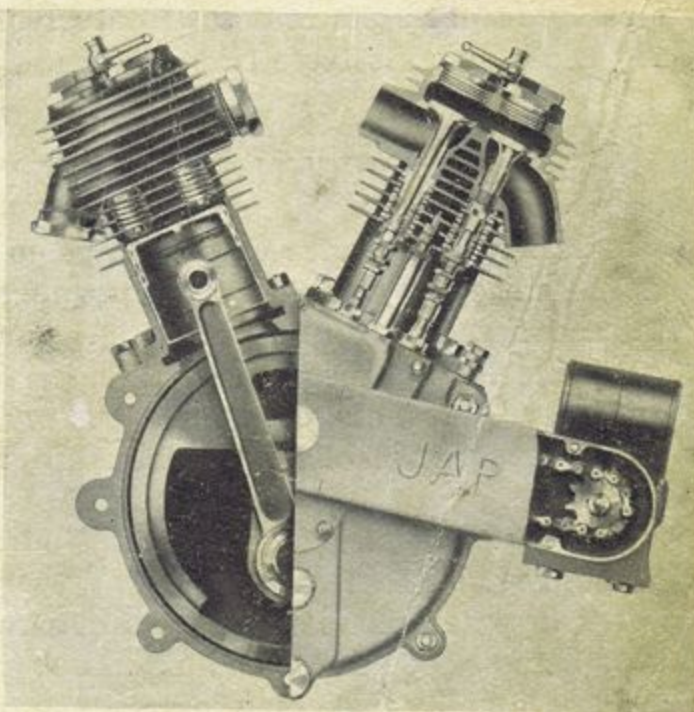
Fitted with the Royal Enfield Patent  
Two-speed and Free Engine Gear

1 The Royal Enfield Side-car Combination is generally recognised as the most efficient and satisfactory three-wheeled motor vehicle ever produced. It represents the applied knowledge of many years' experience in the manufacture of motor cycles for side-car work, and embodies all that is best in design and construction. The many patented and registered features give this model an individuality possessed by no other side-car combination, and these features, together with the sound engineering practice introduced throughout the general construction, are responsible for that high measure of satisfaction which the Royal Enfield owner invariably derives from his machine.

2 The standard Royal Enfield Side-car Combination is the 6 h.p. model, which is the machine illustrated inside the fold of the preceding pages. This

illustration represents the machine fitted with our present type of coach-built side-car, an exceptionally well designed and comfortably upholstered body, giving ample room and providing a well-sprung seat properly insulated from road shocks and jars. The side-car chassis is our own design and manufacture. It is exceptionally strong, and the attachments to the motor cycle, the coupling lugs, are actually

part of the motor cycle frame, and are brazed in position at the same time as the frame is built up. This method gives a perfect attachment and absolute security.



Sectional View of Engine and Magneto Drive



- 3 We supply this model with an 8 h.p. engine instead of the 6 h.p. as an option to suit those of our clients who prefer the largest engine capacity available. A reasonable extra charge is made to our standard price when the larger engine is fitted. With the exception of this difference in engine capacity—one is 770 c.c., the other 965 c.c.—our 6 h.p. and 8 h.p. side-car models are identical in design, construction, finish and equipment.
- 4 The Royal Enfield Side-car Combination Model 190 is our standard 6 h.p. model but with the addition of the Lucas Dynamo Lighting Set. The dynamo by which the current for the light is generated is fitted in front of the engine, and driven by a roller chain from a special sprocket on the engine shaft. An ample mud shield of thin sheet metal protects the dynamo from any mud thrown up by the front wheel. A description and illustrations of the Lucas Dynamo Lighting System appear on pages 32 and 33. Such parts of the motor cycle as differ from those on the standard model are fully illustrated on pages 74 and 75.
- 5 For trade delivery purposes we supply our Side-car Combination with a special Box Carrier Body. On this model the motor cycle and side-car chassis are exactly the same as standard, except that special springs are fitted on the chassis to carry the box body. No luggage grid is fitted on models with this type of body.
- 6 The instructions and advice given in the following pages are based on the experience of our own technical staff and of many private riders. We have endeavoured to deal with everything as clearly as possible, and to avoid involved technical descriptions. All the diagrams have been prepared with this aim in view.

## THE TWIN-CYLINDER ENGINE.

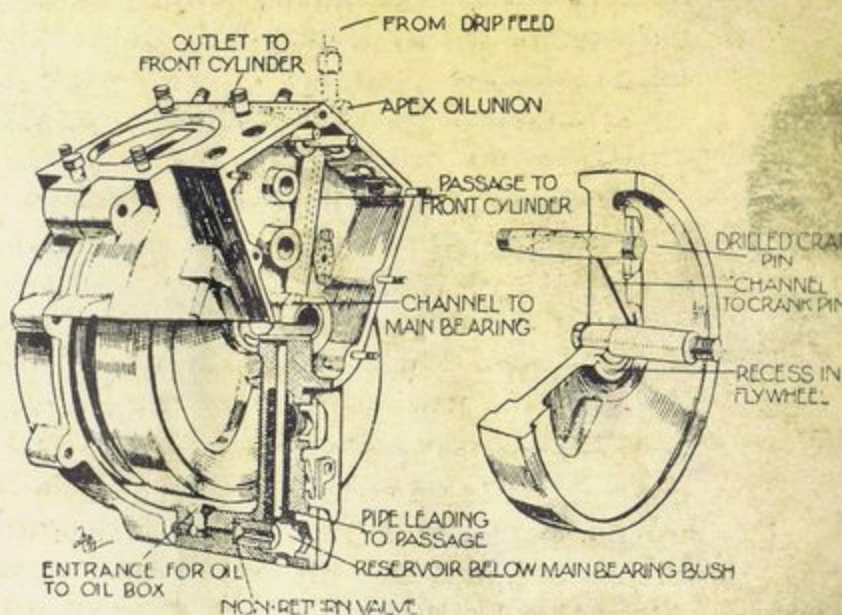
- 7 The twin-cylinder engine fitted to the Royal Enfield Side-car Combination is of substantial proportions, and is without doubt the most efficient and durable high-powered engine on the market. All excessive lightness of construction has been studiously avoided, and every detail of workmanship is of the best. The 6 h.p. engine has a bore and stroke of  $76 \times 85$  m.m. respectively, and a capacity of 770 c.c.; the 8 h.p. engine has a bore and stroke of  $85 \times 85$  m.m., and a capacity of 965 c.c., the cylinders being set at an angle of 50 degrees on each engine.

The patented valve gear is of simple design, one cam shaft only being used, and by an ingenious arrangement the four valves are operated by two cams, one for the inlet valves and the other for the exhaust valves. Hardened steel levers are disposed between the cams and the tappet rods, as shown in the diagram on opposite page.

- 8 One of the most important features in this twin-cylinder engine is the system of pressure feed lubrication to the principal

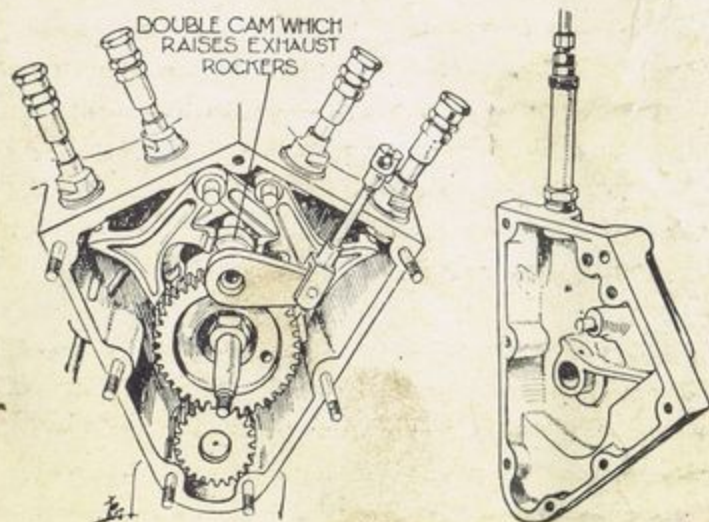


internal parts, as indicated in the accompanying diagram. An oil box is cast on the side of the crank case, and a passage communicates between this oil box and the crank case through a non-return valve. From a recess in the fly-wheel the oil is projected by centrifugal force through passages in the fly-wheel to the crank pin and the principal bearings, which are the most difficult to lubricate by the methods ordinarily employed.



- 9 The lubricating oil is conveyed to the crank case in two ways : an automatic drip feed lubricator with a glass dome is fitted on the tank of the machine in full view of the rider. This can be set according to requirements, to maintain a continuous flow of oil whilst the engine is running (see paragraph 25). The oil pipe enters the crank case at the apex between the two cylinders. In addition to this drip feed a force pump is fitted operating through a two-way tap. Oil can be forced through this tap either to the crank case or to the two-speed gear, as clearly shown in the diagram on page 11.

The arrangements for silencing the exhaust include our improved type of silencer, with double outlet pipes leading from the



silencer chamber. This highly efficient silencer makes the Royal Enfield very quiet in running, and at the same time the general design allows of a clear and easy exit for the exhaust gases.

The standard carburetter is the AMAC multiple jet type, handlebar controlled, and is fully described on page 21. It is specially made for this Royal Enfield model.

- 10 The magneto we are fitting at present is the latest Thomson Bennett A.C.V. type. It is carried on a special aluminium bracket



in front of the engine in a perfectly safe position, and where it cannot be affected by heat. This magneto is referred to more fully on page 22.

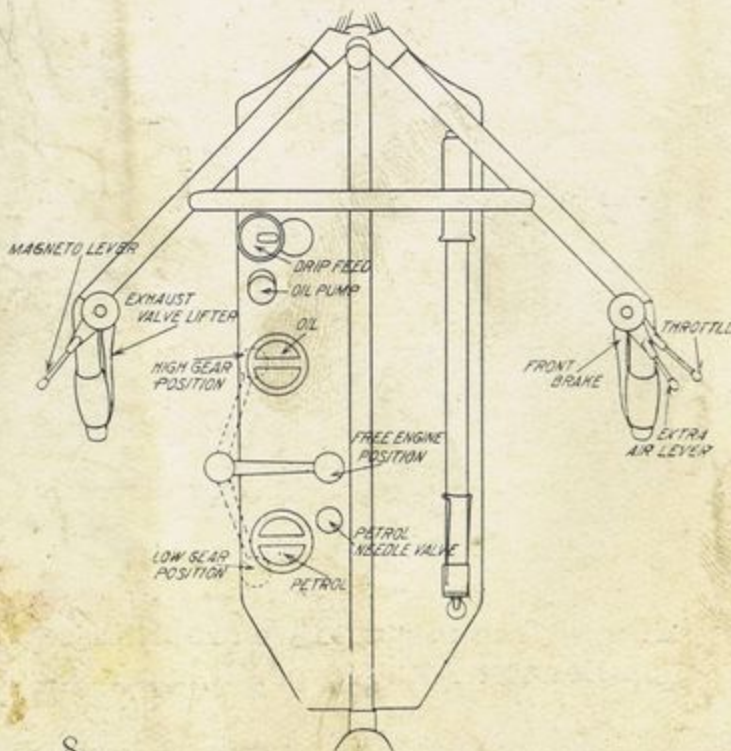
- 11 The Lucas Dynamo Lighting Set fitted to our Model 190 is dealt with on pages 32 and 33, also pages 76 and 77.

In the following paragraphs will be found full instructions on starting up the engine.

## TO START THE ENGINE.

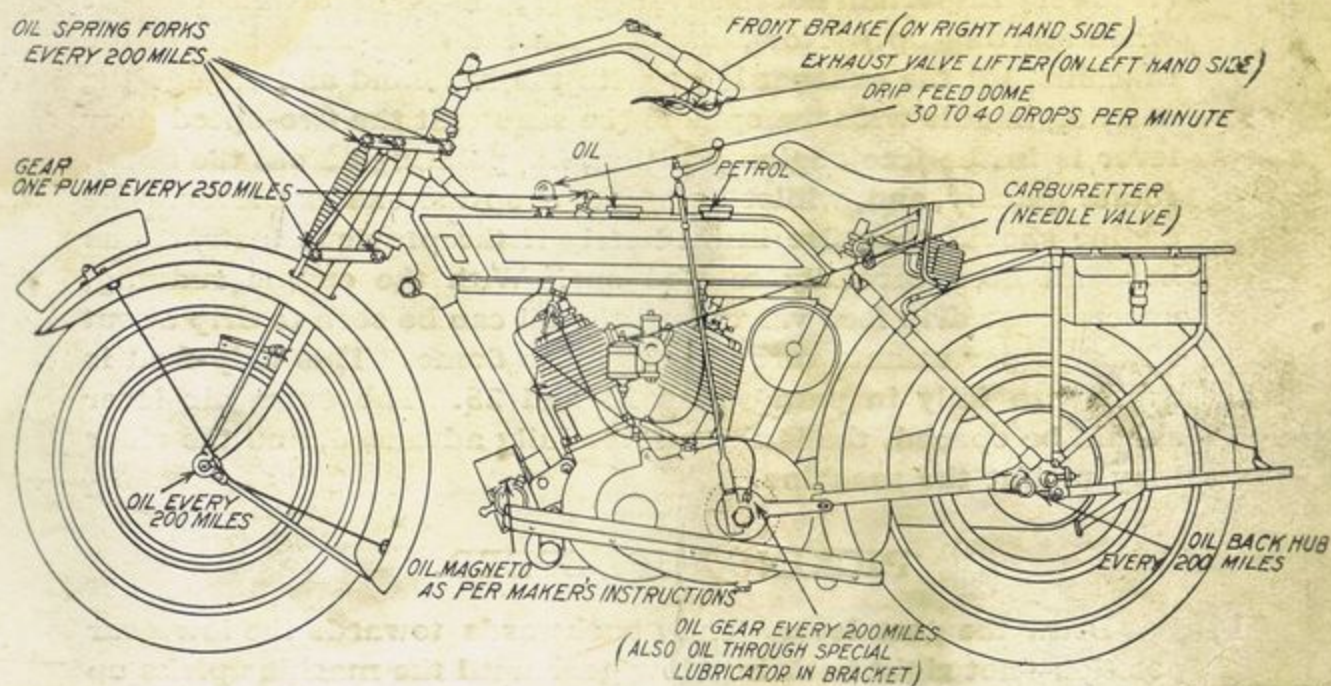
- 12 Assuming that the rider has little knowledge of motoring matters, it is advisable first of all to study the diagrams on the opposite page in order to become acquainted with the various controls and their position on the machine. Having done this, fill up the petrol tank through the large glass topped filler nearest the saddle, and also fill up the oil tank through the filler in front. A supply of oil, about one pint, is also required in the two-speed gear box (see diagram page 12). For the lubrication of our side-car model we strongly recommend our own special Royal Enfield motor oil (see paragraph 23), or Vacuum T.T. Oil. Underneath the tank will be found a two-way tap through which the oil passes, and when this tap is moved forward, the oil flows into the crank case, and so to the engine. When pulled backwards the oil is conveyed to the gear. First of all draw the plunger (or pump handle) steadily upwards to its fullest extent, move this tap forwards, and then push the plunger down, and the oil will be forced through the oil pipe into the engine. For a machine in daily use one charge at the beginning of the day's ride is sufficient for starting up, but if the machine has been standing for any length of time, or if it is the first time the engine has been started since delivery from the factory, then it is advisable to give two full pumpfuls.

- 13 The next operation is to turn on the petrol by unscrewing the needle valve on the top of the tank about three turns, which allows the petrol to flow into the carburetter. Depress the needle of the carburetter for a few seconds until the petrol slightly overflows, and then open the throttle lever about half-way, keeping the extra air lever quite closed. The ignition lever should be advanced to about two-thirds of its full opening.

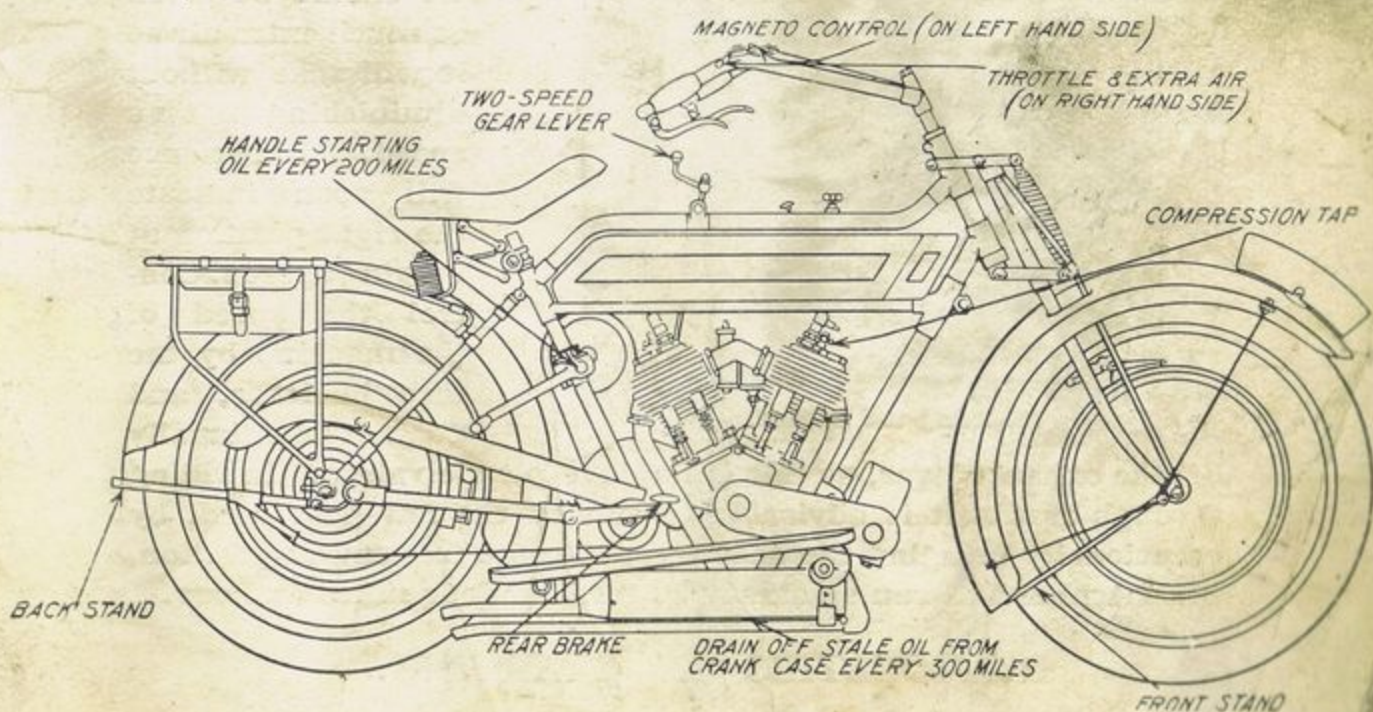




# DIAGRAMS OF THE CONTROL LEVERS AND LUBRICATING POINTS.



The above diagram shows the Royal Enfield from the gear (or side-car side). For convenience in illustrating the various parts the side-car is not shown.



The Royal Enfield viewed from the transmission side. Note the starting handle, which is held in a swivelling clip when not in use.

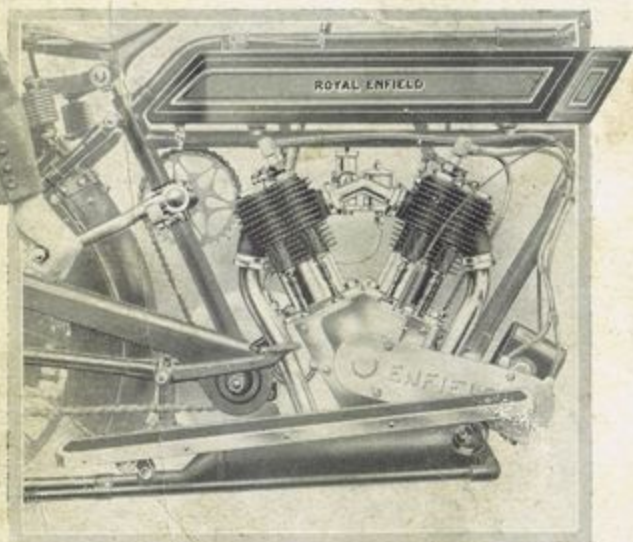


(It is very important not to advance the ignition to its fullest extent when starting up.) Now, standing on the right-hand side of the machine, lift the exhaust lever with the left hand and engage the starting handle with the spindle (be sure that the two-speed gear lever is in the free engine position, *i.e.*, pointing across the tank), rotate quickly, and, whilst doing so, drop the exhaust lever. The engine should then fire immediately if the previous instructions have all been carefully carried out. With the engine running, unscrew the drip feed valve until the oil can be seen to drip about 40 drops per minute through the glass dome. This drip-feed is dealt with fully in paragraphs 24 and 25. The extra air lever should be opened, the ignition lever fully advanced, and the rider may mount the machine.

### PICKING UP SPEED.

- 14 Draw the gear lever gently backwards towards the low gear position—not right back into low gear until the machine picks up speed. If the lever is drawn back too quickly, the sudden engagement of the clutch will stop the engine, and the process of starting up will have to be gone through again. As soon as the machine picks up speed the gear lever should be sharply pushed forward

to the high gear position. Gradually open the extra air lever. The carburetter should be given as much extra air as it will take without diminishing the speed. Experience will soon indicate the right position at varying speeds. Control the speed of the machine by the throttle lever, and do not continually



Starting the Engine.

lift the exhaust lever, as this is liable to pit the valves. In riding through traffic it is advisable to run on the low gear, and, by occasionally bringing the gear lever into the free engine position, the machine will run as slowly as three or four miles an hour.

### DIFFICULTIES IN STARTING.

- 15 Providing all the instructions are systematically carried out, there should be no difficulty whatever in starting up. Of course, when a machine has not been running for some length of time, or



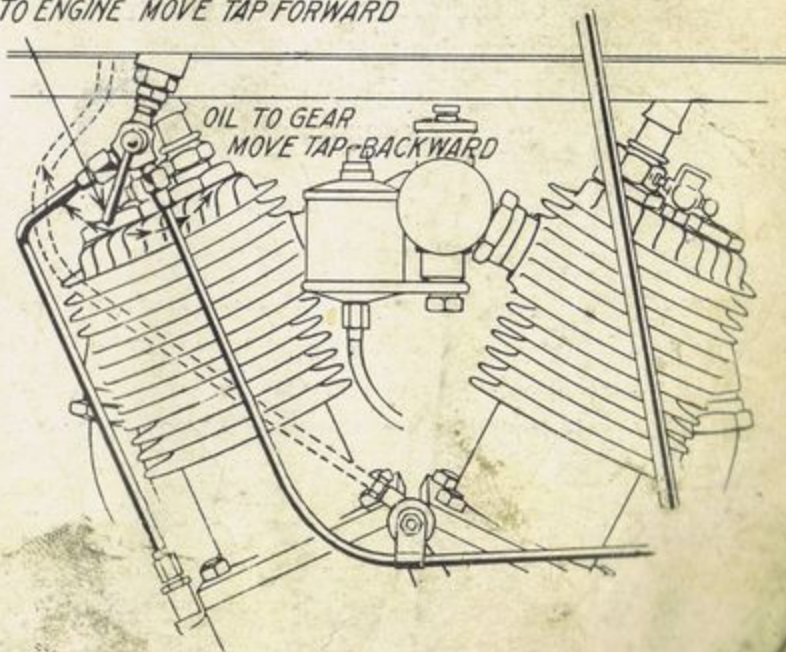
in extremely cold weather, it may occasionally fail to start without a little persuasion. If the carburetter overflows readily, the petrol supply is all right, and by injecting a small quantity of petrol through the compression tap on the top of each cylinder, this may be sufficient to free the pistons and enable the engine to be started. If, however, this does not overcome the trouble, we would advise a careful examination of the whole machine in conjunction with the information contained in paragraphs 77 to 85.

## LUBRICATION.

16 We advise the use of Royal Enfield Motor Oil (see page 13), or failing this, Vacuum T.T. Oil, as being the most suitable for the Royal Enfield model. Whatever oil is used, buy it in a sealed can, and do not allow anyone to fill up your oil tank from a large "no name" drum. Some garages are in the habit of supplying inferior oils from large casks and charging the same price for them as the best grades of properly refined motor cycle oils.

17 In the paragraph (13) on starting up the engine we have given full particulars as to setting the drip feed to drip about 40 drops per minute. For all ordinary riding this ensures sufficient oil reaching the engine, but when a steep hill is reached, or any conditions prevail which call for greater power from the engine, it is advisable to supplement the supply of oil from the drip feed by an occasional half-pumpful from the hand pump. Draw up the plunger of the pump (this can easily be done from the saddle and whilst the machine is in motion), turn the two-way tap forwards and press the plunger steadily down, turning off the tap after time has been allowed for the oil to travel along the pipe. If the drip feed does not appear to drip regularly, or sufficiently, do not fail to supplement it by these occasional half-pumpfuls of oil. Lubricating oils vary in viscosity, and

*DRIP FEED OIL PIPE IS INDICATED BY DOTTED LINES  
OIL TO ENGINE MOVE TAP FORWARD*





in cold weather heavy oils will not always run through the drip feed sufficiently fast to effectively lubricate the engine.

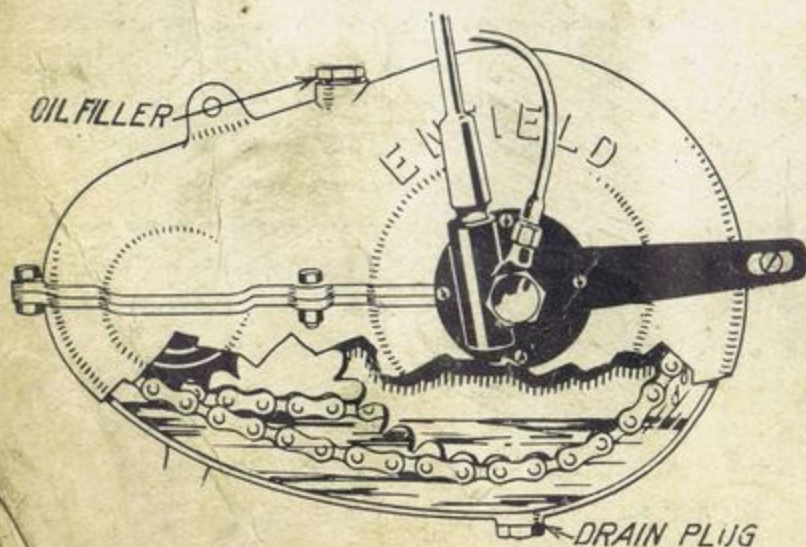
18 It should be remembered that at all times it is far better to over-lubricate than to under-lubricate. The worst that can happen in the case of over-lubrication is an occasional sooted plug and slight carbonisation, whilst the rider who persistently under-lubricates will quickly ruin any engine. After about every 300 miles the drain tap at the bottom of the crank case (see diagram on page 9) should be opened and the oil drained out. This is more easily done at the conclusion of a ride, when the oil inside the crank case is warm, and consequently flows more readily. After the oil has ceased to drip, close the tap, and before starting the engine again, give two complete pumpfuls of oil with the hand pump in order to replenish the supply which has been drained out.

19 The two-speed gear should be oiled about every 200 miles by pulling the two-way tap towards the rider, and giving a full charge of oil with the hand pump. The gear must also be regularly oiled through the lubricator in the bracket by injecting two tablespoonfuls of Motor Oil every 200 miles (see diagram on page 16). The hubs of the wheels, the bars of the spring forks, and other parts of the machine should be periodically lubricated with a very light motor oil, or good cycle lubricating oil. The diagrams on page 9 give full instructions in regard to the lubrication of these parts.

20 The magneto requires lubricating as directed in paragraph 55.

21 The driving chain should be lubricated thoroughly about every 800 miles, as directed in the instructions given in paragraph 46 on the chain transmission. It is also advisable to run a little oil along it about every 200 miles.

22 A supply of lubricating oil should always be maintained in the big end of the aluminium gear box. As machines are despatched from our works with the gear box empty—for safety in transit—it should be filled with about one pint of oil before the machine is used. As the accompanying diagram shows, the chains will dip



into this, and a good supply of oil will be carried round to the sprockets. The oil filler is at the top, and the drain plug for accumulated and worked-out oil is at the bottom, as shown. The oil should be drained out and the supply replenished about every 500 miles.

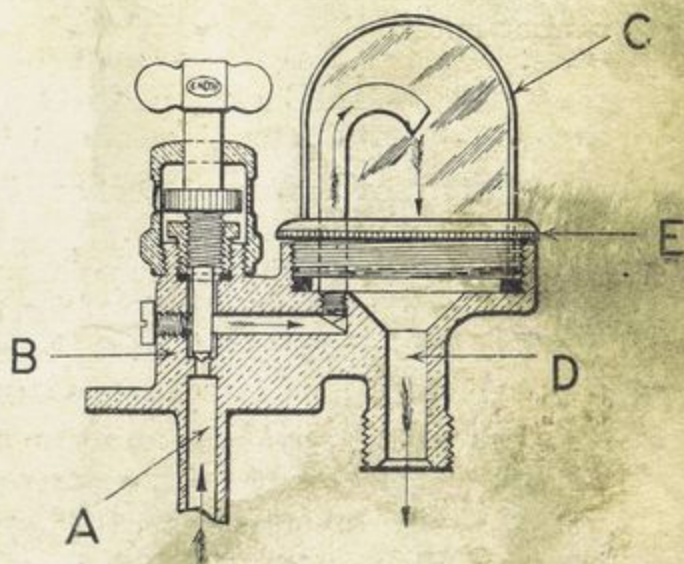


## ROYAL ENFIELD LUBRICATING OIL.

- 23 To ensure a perfectly suitable oil for Royal Enfield motor cycles, we have had a special brand prepared and refined for our models. This oil has been carefully analysed, and for our motor cycles is superior to most lubricating oils. It can be obtained through any Royal Enfield agent, or direct from our works if any difficulty is experienced in getting it locally. It is put up in quart tins, or it can be supplied in five and ten gallon drums. We strongly recommend these drums in preference to the small tins, as there is less wastage of oil and the price is proportionately less per gallon. Current prices will be quoted on application.

## THE DRIP-FEED LUBRICATION.

- 24 Besides the hand pump and two-way tap referred to in paragraph 17, automatic lubrication of the engine is effected by means of the drip - feed lubricator. The glass dome furnishes proof as to the drip of the oil. The working of the system is thus visible to the rider.



- 25 The flow of oil is induced by suction from the crank case which causes the oil to travel from the oil compartment of the tank by the tube A, past the regulating valve B, and thus through the glass-domed chamber C down the passage D, and along the oil pipe to the non-return valve through which it enters the crank case (see diagram on page 7). The flow of oil can be regulated by the needle valve B from a few drops per minute to an almost continuous flow, and once the rate of flow demanded by existing conditions has been determined, it will continue as long as the engine is running and there is a supply of oil in the tank. For all average purposes about 40 drops of oil per minute passing through the dome is usually satisfactory. The glass dome is held in position by a screwed collar E, which can readily be removed for cleaning. To ensure proper working all joints and connections must be screwed up so as to be absolutely air-tight, especially the glass dome, which should be properly seated on its washer. Unless all joints are air-tight, the system will not work. Occasionally foreign matter from the lubricating oil will accumulate at the lower end of the regulating valve B; this can be dispersed by



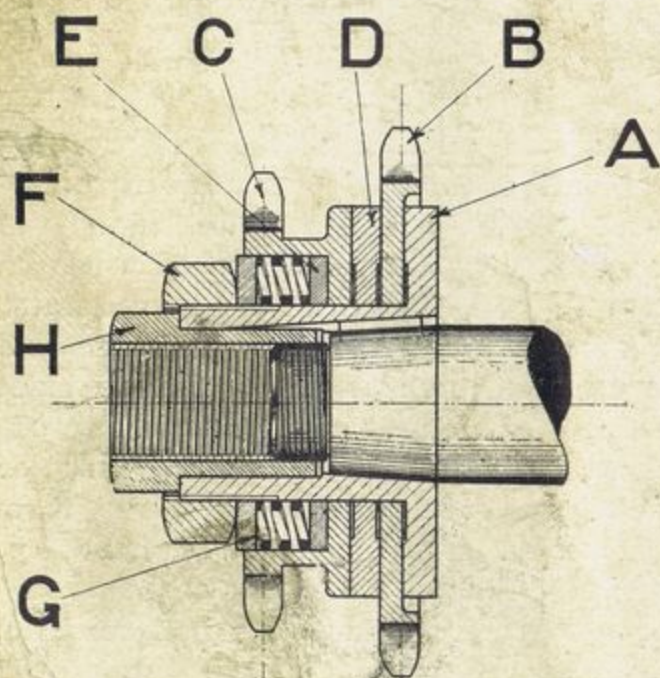
removing the glass dome and connecting a tyre pump to the end of the drip-feed pipe. This will usually blow the obstruction back into the oil tank. The same cause of obstruction may occur in the non-return valve, or apex oil union, through which the oil enters the crank case. If the flow of oil is interrupted, and all joints appear to be perfectly air-tight, this non-return valve should be carefully examined, as some foreign matter may have been carried down with the oil and lodged in the valve. A bolt runs through this valve, and a fibre washer on either side makes a perfect joint. The washer with the larger hole fits on the crank case side. Too much importance cannot be attached to these washers being properly in position, and the joints quite tight. The efficiency of the entire system of engine lubrication depends on this.

- 26 We strongly advise that all lubricating oil should be poured into the tank through a gauze strainer, so that foreign matter cannot enter.

## THE SLIPPING CLUTCH.

- 27 The great feature of the chain transmission on the Enfield models is that the usual shakes and jars associated with chain drive are entirely eliminated. In the rear wheel the Royal Enfield Patent Cush Drive Hub prevents any snatching at the chain, and on the engine shaft the Slipping Clutch reduces the engine shocks.

- 28 The accompanying diagram clearly shows the working of the slipping clutch. A is a bush or centre mounted on the engine



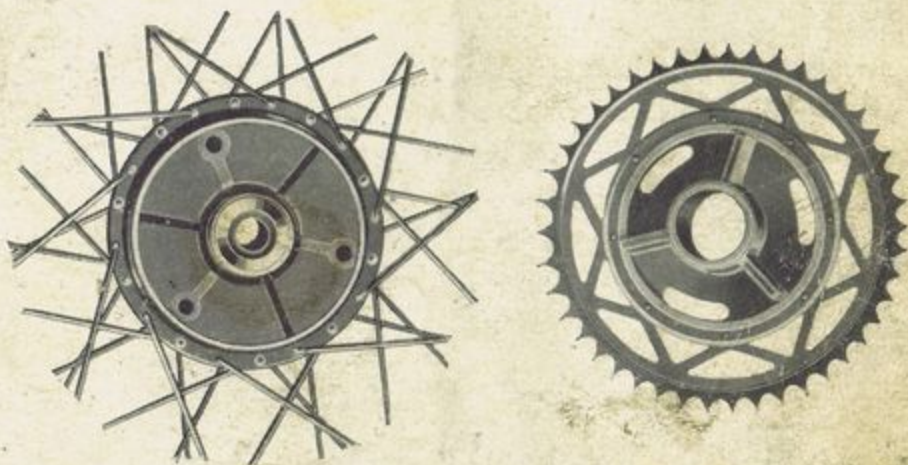
shaft and secured by nut H; B and C the high and low gear sprockets respectively; these can revolve on the bush A between the friction washers D and E and the flange of A. G is a spring retaining plate. The members D, E and G are so arranged that they may slide, but not revolve, on the bush A. F is the adjusting nut. When properly adjusted the sprockets "slip" between the friction washer just sufficiently to absorb the engine shocks. The action is perfectly simple, and the

only adjustment which may be necessary is an occasional tightening of the nut F. The action of slipping locks this nut in position.



## PATENT CUSH DRIVE REAR HUB.

- 29 The Patent Cush Drive Hub which is fitted to all Royal Enfield models takes up the drive from the countershaft to the rear wheel with great flexibility and smoothness. This hub has a marked effect on the running of the machine, absorbing, in conjunction with the slipping clutch mentioned on the previous page, the engine shocks and preventing any snatching of the driving chain. This hub also minimises the wear on the rear tyre to a surprising degree. As the illustration shows, the end of the rear hub is provided with three metal vanes, and the inside of the driving sprocket has three similar vanes. On each side of the metal vanes on the hub is placed a block of solid rubber, and the vanes



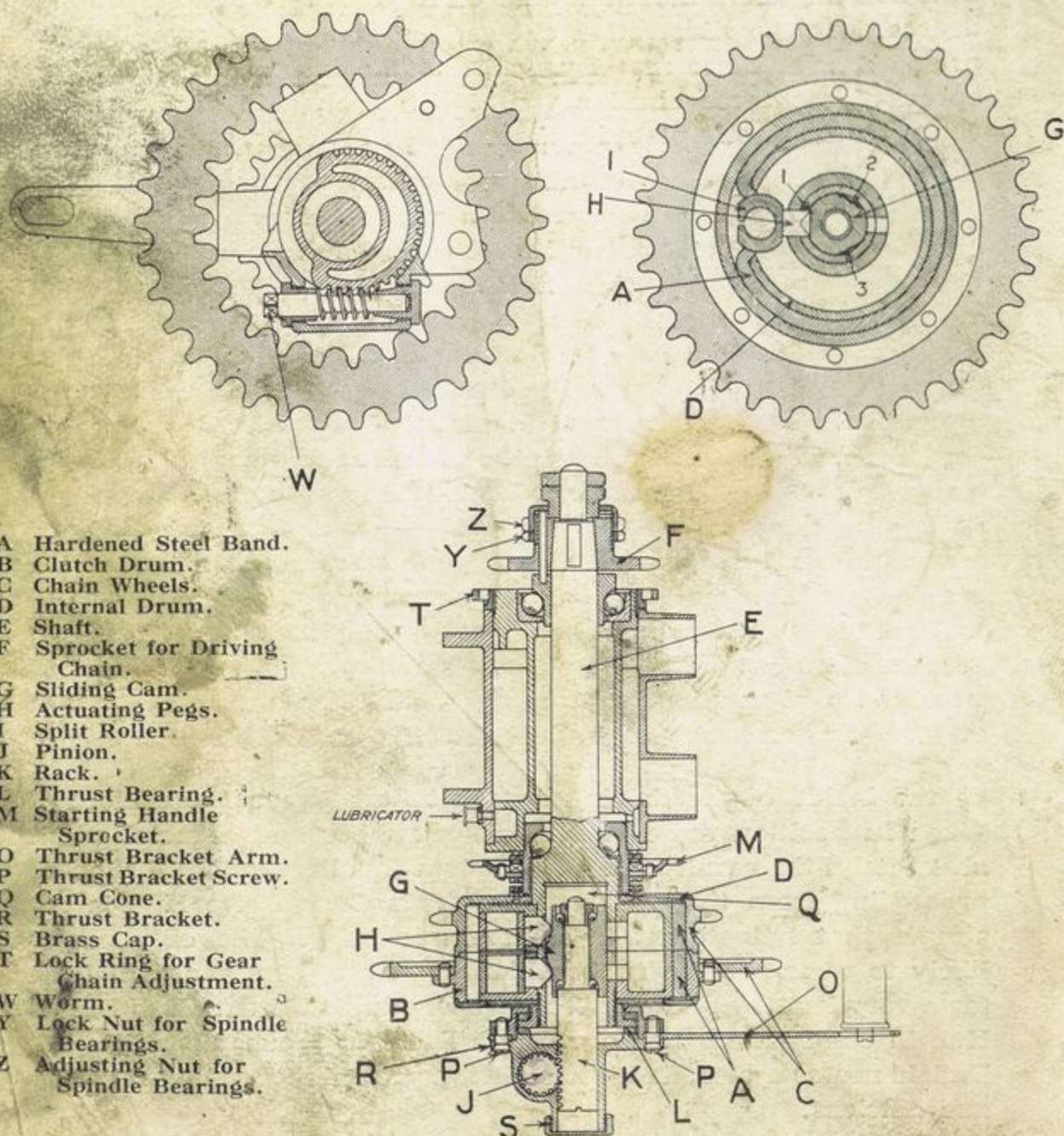
on the inside of the driving sprocket fit between these blocks. When in position there is a block of rubber and a metal vane alternately, the result being a complete equalisation of all shocks proceeding from the countershaft. This Cush Drive Hub is so simple that adjustment is seldom necessary. The only parts likely to wear are the rubber blocks; these, however, will last for a very lengthy period. We have fitted this Patent Cush Drive Hub in conjunction with our Chain Drive to thousands of Royal Enfield motor cycles, and it has always proved thoroughly reliable and efficient.

- 30 The bearings of the rear wheel are adjusted by means of the adjusting cone on the left hand side of the hub. Adjustment can be carried out by loosening the lock nut and adjusting the wheel cone with the special spanner provided in the tool-kit. This adjustment does not affect the Cush Drive part of the Hub in any way.



## THE ENFIELD PATENT TWO-SPEED AND FREE ENGINE GEAR.

31 The Enfield two-speed gear is of the expanding clutch type, and is operated by a vertical shaft and hand lever affixed to the top tube of the frame, in a position convenient to the driver's hand.



There are no clutch or gear pedals whatever. The power is transmitted by two roller chains (on the left-hand side of the machine) from sprockets on the engine shaft, one for each gear,



to a countershaft in the bottom bracket, which contains the two-speed mechanism. The drive from the countershaft to the back wheel is by a roller chain on the right-hand side of the machine. Midway between the two gears is the free engine position, which is passed through to engage either gear. The drive through both gears is direct, thus obviating that friction which is created when running through gear wheels.

Either gear is brought into action by expanding the hardened steel bands A into one of the drums B, also of hardened steel, and to which the chain wheels C are fixed, the change in gear ratio being effected by different sized sprockets. The expanding bands A are carried on internal drums D; these take the drive and are keyed to the shaft E, which runs on ball bearings. The sprocket F is also keyed to E, and transmits the power to the back wheel.

- 32 The clutches are each engaged by a cam cut in the block G, sliding in either direction, according to which gear is required. The action of sliding the cam is to force one of the pegs H against a split roller I. This forces open the band A, and it engages with B, which is rotated by the engine.

The roller I being split allows the clutch to pick up very smoothly. The block or cam G is moved by a rack K and pinion J, operated by a vertical shaft and hand lever affixed to the top tube of the motor cycle. Three faces, numbered 1, 2 and 3, are cut in G, each face being .005 inch higher than the one before it. Should any wear take place it can be adjusted by engaging a new cam face, which is but the work of a few minutes. There is no thrust on the bearings when either in gear or free engine; thrust occurs only when the clutches are being engaged or released; then it is only momentary, and is taken up by a thrust bearing L.

- 33 The chains from the engine to the two-speed gear sprockets are adjusted as described in paragraph 40 by an eccentric in the bottom bracket, which carries the spindle E. The final driving chain from the countershaft sprocket to the rear wheel is adjusted in the same way as an ordinary bicycle chain, by means of the adjusters on the fork ends.

- 34 The standard gear ratios fitted to the 6 h.p. Enfield with a 14 T. countershaft sprocket are as follows: High Gear, 5 to 1; Low Gear, 8.9 to 1. On those models fitted with the 8 h.p. engine and a 16-T. sprocket the gear ratios are: High Gear, 4.3 to 1; Low Gear, 7.7 to 1.

## GEAR ADJUSTMENT.

- 35 The reliability of the Enfield Patent Two-speed Gear is almost proverbial, and the only adjustment which is likely to be necessary, under ordinary riding conditions, is the engagement of the second or third cam face. As previously described, the expanding



clutches in the gear are operated by a three-faced cam, the faces marked 1, 2 and 3 respectively.

- 36 To engage the second or third cam face the following instructions should be carried out:—

It is not necessary to remove the cap S (see diagram on page 16). First move the two-speed gear lever into the low gear position, and then remove the four screws (P) which retain the thrust bracket in place. Next move the gear lever towards the free engine position until there is sufficient clearance for a thin-bladed screwdriver to be inserted between the thrust bracket (R) and the thrust bracket arm (O). The screwdriver must be placed right down on to the top of the rack (K) so that the leverage will be as central as possible. A tapering screwdriver is not recommended, as this will give unequal leverage. In place of the screwdriver any flat spanner can be used so long as it does not exceed  $\frac{1}{4}$  in. in thickness. When the screwdriver is properly placed pull the gear lever forcibly back into the low gear position, and this will bring the thrust bracket, together with the rack and cam, clear of the actuating pegs (H), and it can then be removed by hand. The cam (G) is in one piece with the rack (K).

- 37 When the rack and cam have been withdrawn, the next cam face should be engaged in alignment with the actuating pegs. The faces are numbered 1, 2 and 3. For instance, if, when dismantled, it is found that No. 1 face has been in use the face marked No. 2 should take its place. When reassembling the gear the cam and rack must be gently driven into place, either with a wooden mallet or a copper-headed hammer, or if a steel hammer is used, place a piece of wood between the hammer and the rack so that the latter is not damaged. When the rack reaches the position it should occupy with the gear lever in the free-engine position, the thrust bracket can be replaced and the screws (P) inserted.

- 38 If further adjustment is necessary when No. 3 cam face is in use it is advisable to fit a slightly longer actuating peg (H) and re-assemble with No. 1 face in position. When ordering new actuating pegs state if they are required for this purpose.

- 39 Sometimes when the slipping clutch requires slight adjustment the trouble is erroneously attributed to the gear. In all cases before making any adjustment to the two-speed gear the nut on the end of the slipping clutch should be tightened up, as this will probably remedy the trouble (see diagram on page 14).

### ADJUSTMENT OF GEAR CHAINS.

- 40 From the remarks given in paragraph 47 on the general care and adjustment of the chain drive, it will be seen that it is very necessary the chains should be run at proper tension, neither too tight nor too slack. The two chains from the engine shaft sprockets to the countershaft sprockets are very simply adjusted



by means of the eccentric in the bottom bracket and the worm and sector adjuster. The following instructions should be closely followed in adjusting the gear chains, and a reference to the diagram on page 16 will make these instructions clear.

On the end of the bottom bracket eccentric will be found a lock ring (T). If this lock ring is loosened the adjustment can then be made by means of the worm (W), which has a square head to take a spanner. This worm is placed underneath the bracket. To tighten the chains the worm should be turned in an anti-clockwise direction—that is, by using the spanner in the same way as if withdrawing an ordinary right-hand threaded screw.

It is important to remove the upper half of the gear box covering the gear chains, so that these can be watched during the process of adjustment, and care taken to see that neither of the chains is left too tight. The worm and sector adapts itself, so that very minute adjustments can be made. At the same time, it is often a difficult matter to get both gear chains adjusted to the same degree of tension, in which case one of the chains must be left with a slight tendency towards slackness, so that the other chain is not tensioned too tightly. After the adjustment has been made see that the lock ring (T) is properly tightened up.

## ADJUSTING THE MAIN SPINDLE BEARINGS.

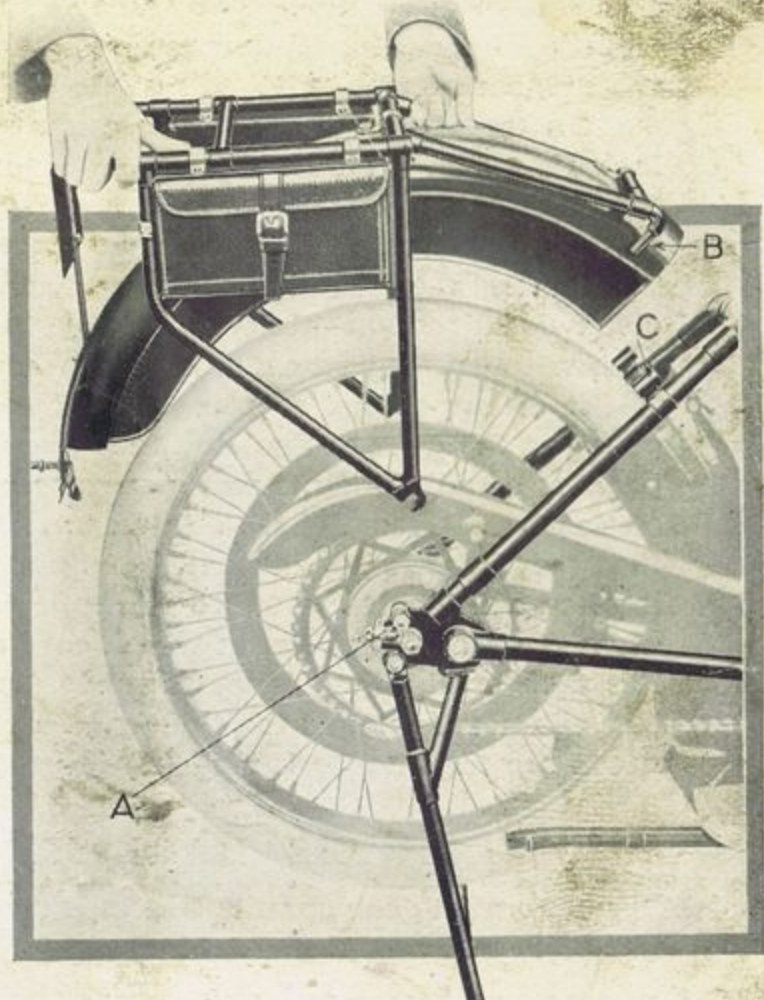
- 40A The main gear spindle bearings are adjusted by means of the nut (Z). The adjustment is locked by the nut (Y), and this should be loosened before any adjustment is made—it has a right-hand thread. It is then advisable to place the gear lever in the free-engine position. The adjustment is made by means of the adjusting nut (Z), which also has a right-hand thread. Extreme care is necessary to ensure that the bearings are not adjusted too tightly. After any adjustment has been made see that the lock nut (Y) is carefully tightened up again.

## DETACHABLE CARRIER AND REAR MUD-GUARD.

- 41 The Carrier and Rear Mudguard on all Royal Enfield models are made to detach in a few seconds so as to give access to the rear tyre and wheel.
- 42 The illustration overleaf shows the carrier and the rear guard being lifted clear of the wheel. To do this first slack the nut (A) on each side of the back fork plate; a few turns will be sufficient. The prongs (B) are fitted in socketed lugs (C), the latter being brazed to the back stays of the frame. When the nuts (A) have been slackened the carrier should be tapped sharply upwards, the force being applied in a direction parallel with the back stays of the motor cycle frame. The carrier and mudguard should then lift quite clear.



43 When replacing, the prongs (B) should be placed just over the sockets (C), and the slotted ends of the carrier stays placed in position over the studs on the fork plate. Push the prongs firmly down into the sockets so that the two portions of the mudguard fit closely together. The nuts (A) should then be tightened up.



44 When in position this carrier and guard are very firm and secure. The rapidity with which they can be detached is a great advantage to motor cyclists, especially in case of puncture.

### CHAIN TRANSMISSION.

45 The system of chain transmission on all Royal Enfield motor cycles is absolutely perfect. It obviates the frequent breakages and adjustments which occur with belt-driven motor cycles, and, providing ordinary attention is given, the chains will run thousands of miles without trouble.

46 It is as necessary to lubricate the chains as the engine. One of the best chain lubricants is "Rangraphine." After about every 800 miles running the driving chain should be taken off the sprockets, washed thoroughly in petrol or paraffin to remove all grit and dirt, and carefully dried. It should then be laid in the lubricant and warmed, so that it penetrates fully into the links. The chain should be left to cool, and afterwards, before replacing on the sprockets, any excess of lubricant on the outside should be carefully wiped away. It is not so much a question of the lubricant being on the outside of the chain, but what penetrates to the rollers and links that ensures perfect running.

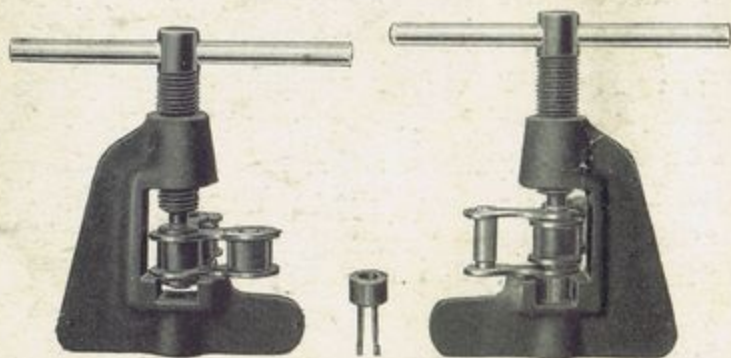
47 The gear chains should be so adjusted that when on the sprockets no part of the chain will lift up from its line more than  $\frac{1}{4}$  in. With the driving chain a little more latitude must be given.



If the chain is allowed to become too slack it is apt to "whip," which intensifies the wear and breaks the rollers. If, on the other hand, it is too tight, the pressure on the rollers is too great, and the whole chain is liable to be unduly strained.

- 48 The adjustment of the driving chain is effected in exactly the same way as an ordinary bicycle chain, chain adjusters being fitted on the back fork ends. Adjustment of the rear brake is usually necessary after the driving chain has been adjusted.

- 49 The two chains driving from the two sprockets on the engine shaft to the two-speed mechanism are oiled from the gear box, and there is no need to subject them to any special treatment, except when the machine is undergoing a thorough overhaul, which

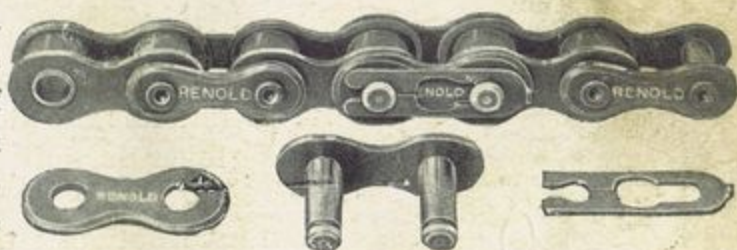


should be afforded it, say, after every five or six thousand miles. If it should be necessary at any time to remove a link from either of the chains, the special Hans Renold stud extractor should be used. The illustration shows the method of

using the tool. On the left it is shown removing a rivet. The process consists in forcing the rivet head out of the upper side plate by turning the screw. Both rivets in the same link have to be forced out, care being necessary in placing the chain in the extractor, so that the under side plate can fall away between the jaws of the tool.

- 50 The process of replacing a rivet is carried out by the use of the spring pin shown in the centre of the illustration. This fits between the jaws of the tool, and has a recess (or hole) in its head to take the head of the rivet when forced into the holes in the lower

side plate. It must then be riveted with a light hammer. The quickest method of joining up a chain after an outer link has been removed is to use the spring clip joint



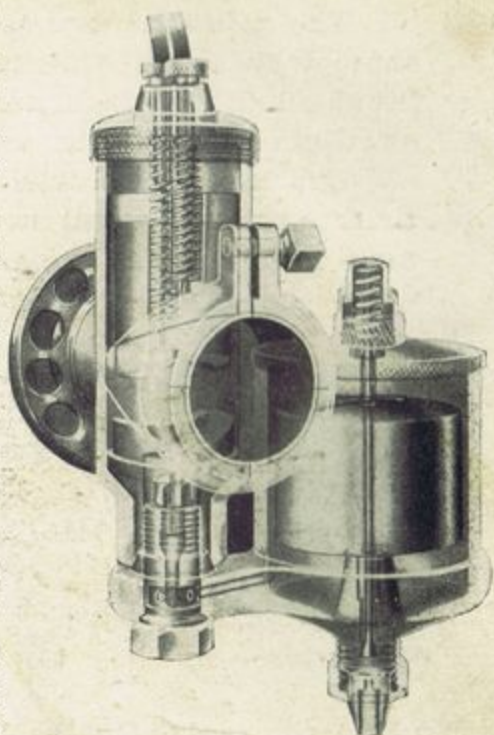
shown in the accompanying illustration. When in position this spring clip is quite safe and secure, but it requires careful handling in fitting, owing to the delicate tension of its spring.

CARBURETTER.

- 51 The carburetter is the well-known AMAC MULTIPLE JET TYPE. A very full description of this carburetter is given in the booklet published by the makers, a copy of which we supply on application.

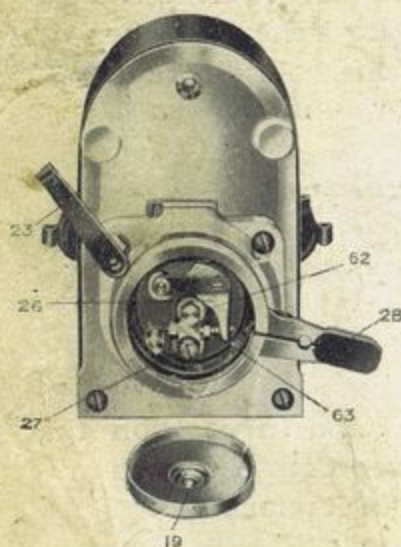


Briefly, the quantity of petrol supplied to the engine is regulated by the single nozzle in the float chamber, after which the petrol is sprayed into the mixing chamber itself through a series of small holes, which give improved vaporisation. The petrol level is just below the top of the multiple sprayer, and the single nozzle is always submerged in petrol. The extra air and throttle valves shut off the mixture gradually but perfectly. The air valve is really a variable choke jet; as it closes it gradually reduces the area just above the sprayer, so that the air at this point always has the correct velocity necessary for the perfect atomisation of the petrol. For ordinary working the carburettor is practically semi-automatic, and there are only three positions for the air lever—namely, fully closed when starting up, slightly open when running slowly, and from three-quarters to fully open at high speeds.



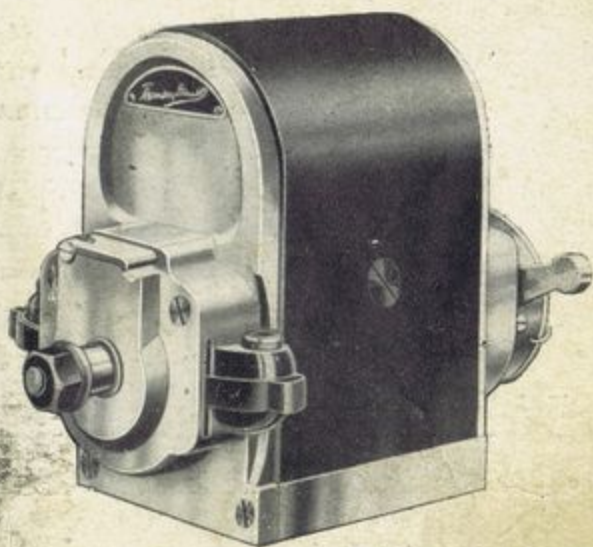
## MAGNETO.

- 53 The most delicate part of the Magneto is the contact breaker (61 E), and it is advisable to inspect it from time to time. In order to ascertain if the contact breaker is working correctly, move flat spring (23) aside, remove end cap (19), and see if the fastening screw (62) is well tightened up, also if the two platinum screws (63) are securely fastened. Further, see if the contact lifter (26) is resting on the contact piece (27) when the fibre block of the lever has left the steel segments, and whether this lever is deflected again when the fibre block glides over the segments, and when the distance between the platinum contacts has to be 0.4 m/m. This gap can be regulated by means of the platinum screw. If this is in order, and it is desired to examine the platinum screws of the contact breaker, same should be removed complete. For this purpose remove first of all timing lever (28), when the contact breaker will be completely exposed; now remove screw (62) by means of the magneto spanner, and carefully take out the





contact breaker. The platinum contacts should be quite clean, and if not, any oil or dirt should be removed. If they are worn unevenly—and only then—they should be filed flat by means of a very smooth file, but only the least possible amount of platinum must be taken off. The proper distance of the gap between the platinum points should be 0.5 m/m. A special gauge of this thickness is provided on the magneto spanner. If the platinum screws are badly worn so that even filing will not improve them, new screws must be fitted. When replacing the contact breaker care has to be taken that it is in the correct position, which is determined by a key and keyway; also when replacing the timing lever (28) care must be taken that the gap provided in same comes over the top screw mounted on the rear end plate.



- 54 Special attention is required to see that the contact breaker (61 E) is a free and easy fit, as the pivot of same cannot be lubricated, it being carried in a fibre bush. On new magnetos it may occasionally happen that owing to the swelling of the fibre bush, caused by change of temperature, the contact lever becomes a fixture. This can easily be rectified by slightly enlarging the bore of the fibre bush by means of a suitable reamer.
- 55 In contrast to the motor, the moving parts of which require very frequent lubrication, the magneto must only be lubricated occasionally. The Thomson-Bennett magneto requires only a few drops of *special magneto oil* once or twice a month, through the special oiling places provided. Ordinary lubricating oil must *not* be used.
- 56 Special care must be taken that the platinum points of the contact breaker are always free from oil, as otherwise it is impossible to make a good contact, and the production of the current from the magneto is considerably reduced.
- 57 A complete list of spare and replacement parts for the magneto is given on page 37 of this book.

## ADJUSTMENT OF FRONT FORK LINKS.

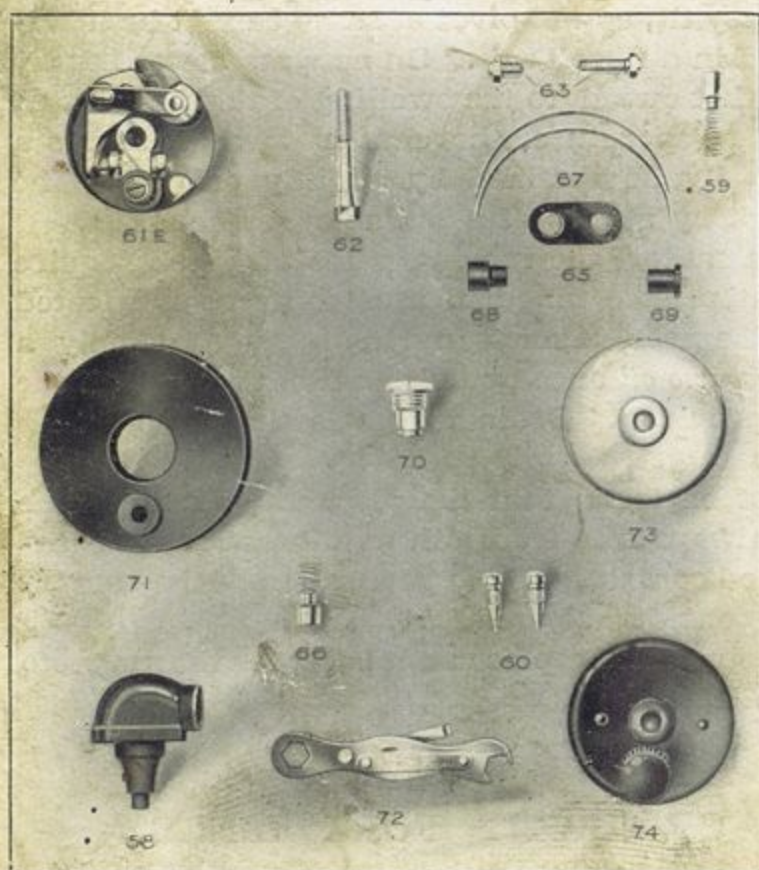
- 58 With our present type of front fork links adjustment is seldom necessary, but if play does become apparent, the links can be easily adjusted as follows :



Unscrew the nuts which are on the right-hand side of the fork, then apply spanner to the bolt heads and tighten bolts as far as possible. Then unscrew each bolt about half a turn, and hold a spanner on the bolt-head whilst the lock nut is firmly secured with another spanner; thus preventing the bolt from moving during the operation. The link which fits under the bolt heads has plain holes, but the link on the right-hand side (*i.e.*, the side on which the lock nuts are fitted) is tapped to take the bolt. It is an advantage, when making any adjustment to the front fork, to take the weight of the machine off both fork and wheel, either by placing something underneath the crank case of the engine, or by suspending the machine from above.

## ADJUSTMENT OF WHEEL BEARINGS.

59 All three wheels should be periodically examined for any signs of slackness or "play." Place the entire machine on the three stands provided. Then, taking each wheel in turn, firmly

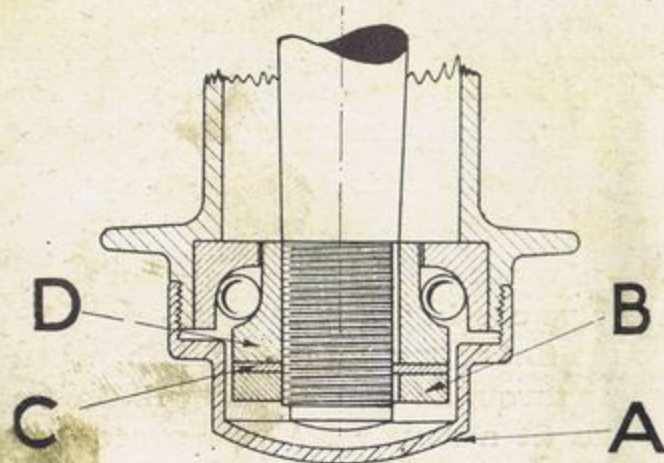


grasp the rim on either side of the hub, and any "play" or side motion will be apparent. To adjust either the front or rear wheel of the motor cycle first slacken the nut on the left-hand side of the hub spindle. A special flat spanner is provided in the tool kit to fit this nut, which has a right-hand thread. Screw up the adjusting cone with the cone spanner reasonably tight, then unscrew about half a turn. Afterwards

For information see paragraphs 53-54.  
tighten up the spindle nut, using considerable force on the spanner to ensure the nut being perfectly secure.



- 60 To adjust the side-car wheel first remove the cap A (see accompanying diagram), then unscrew the lock nut B, and screw up the adjusting cone D, exactly as described above, unscrewing it again



slightly before locking the adjustment with the nut B. This is necessary because screwing up this lock nut will automatically tighten the cone up to the same extent as it is unscrewed. C is a grooved washer between the lock nut and adjusting cone. Before replacing the cap A make quite sure that the lock nut B is perfectly tight and secure.

### REMOVING CYLINDERS.

- 61 First of all remove the sparking plugs, compression taps, petrol and oil pipes, carburetter, and exhaust and induction pipe unions; the carburetter can be removed with the cables complete. Take off the four nuts which hold down each cylinder on the crank case. Possibly the cylinder will not lift straight off, and it is advisable to carefully work it backwards and forwards until it leaves the piston. The cylinder will usually come off more easily when the piston is at its lowest point, and a little careful manipulation will soon determine this. Each cylinder is lifted off in precisely the same way, and after they have been removed the inside of each piston should be filled with soft rag to prevent damage by the connecting rod. If carbon deposit is being scraped off the piston, it is also advisable to cover the top of the crank case with rag, in order to prevent any of the deposit or small parts falling inside. There is no difficulty in dismantling the cylinders of the Royal Enfield, providing it is done very carefully, and that before removing any part one makes sure of the way it is attached. Always have the rear wheel of the machine jacked up on its stand.

### GRINDING-IN VALVES.

- 62 Frequently, when an engine shows signs of gradually losing power, the cause is due to the accumulation of carbon deposit, and the necessity for grinding-in the valves. As a general thing, the exhaust valve requires grinding-in sooner than the inlet valve. Take out the valve cap in the cylinder head, compress the valve spring and take out the flat cotter pin underneath; remove the valve and spring, scrape off any carbon deposit adhering to the valve, rub a little emery paste and oil, or flour emery, on the valve, then place the valve back into position and insert a screwdriver through the cylinder head, placing it in the slot provided on the



head of the valve. The valve should then be gently rotated on its seating by means of the screwdriver, occasionally lifting it up and turning round to prevent rings or "scores" forming. The operation should be continued until both the surface of the valve and its seating are quite smooth and bright. There are several valve grinding appliances on the market, but these are more for workshop use, and the amateur will find the screwdriver process quite satisfactory.

#### FITTING NEW VALVE.

- 63 The operation of fitting a new valve is very simple and only requires care. Take out the valve cap in the cylinder head, compress the spring and remove the flat cotter pin underneath, when the valve can be easily pushed up through the guide and withdrawn through the cylinder head. To fit a new valve this process is reversed. A special tool for compressing the valve spring is supplied in the tool roll.

#### BROKEN VALVE SPRING.

- 64 The instructions given above will be sufficient to enable a broken valve spring to be easily taken off and replaced with a new one.

#### REMOVING CARBON DEPOSIT.

- 65 When an engine has been in use for some considerable time, carbon deposit is bound to form on the piston and cylinder head. This is due usually to the road dust drawn in by suction to the engine through the air port in the carburetter and mixing with the lubricating oil. Using an inferior grade of oil will lead to carbonisation very quickly. The cylinders are removed exactly as described in paragraph 61, and the carbon deposit scraped off the piston with an old knife or a special scraper. For removing the deposit off the cylinder head a long-handled screwdriver is a most useful tool, or a long square file which has been softened and the end turned up makes an efficient scraper. Removing carbon deposit is a process which requires a considerable amount of time and patience, as the deposit sets very hard.

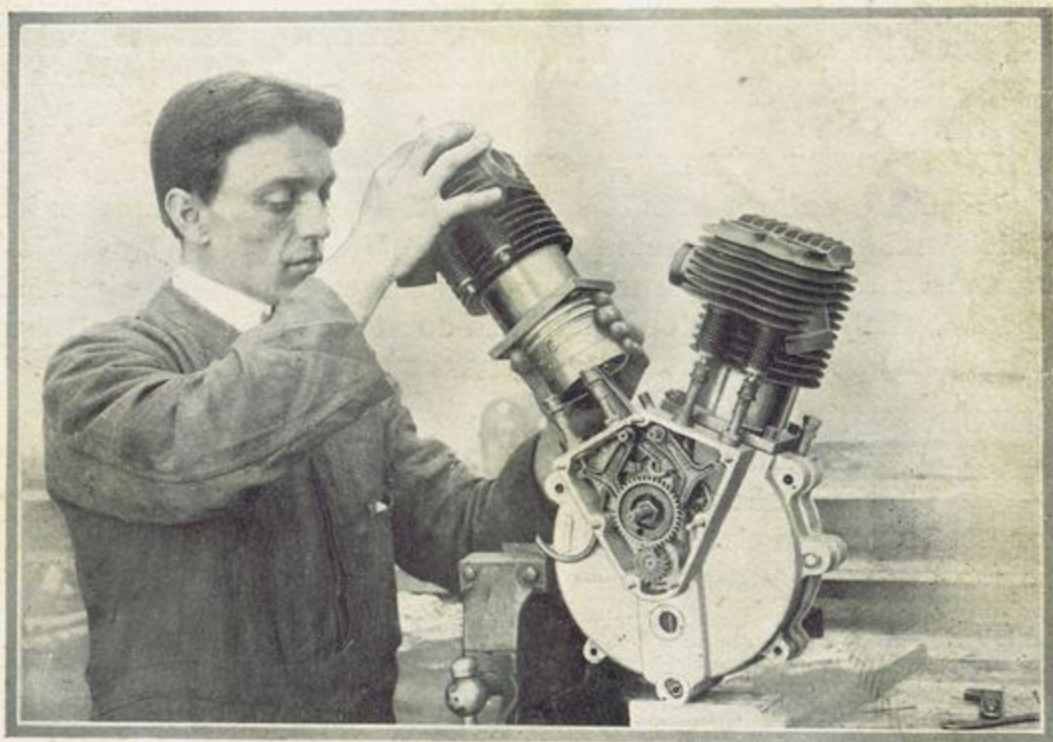
- 66 It will usually be found that the piston ring grooves need to be cleaned out also. Piston rings are extremely brittle, and must be removed with great care. The best plan is to get three or four strips of thin tin, each about half an inch wide. The ring should be removed gently from its groove, one of the pieces of tin inserted underneath it, then pull the ring away a little farther round, insert another piece, and so on. When the ring is lifted right out, it is an easy matter to work it up and over the top of the piston, the same process, but reversed, being used to get the rings back again into their grooves. The bottom ring should be removed first, and replaced last. The carbon deposit can be cleaned out of the grooves without removing the piston, although it is advisable,



as mentioned elsewhere, to place a large cloth round the connecting rod, and also inside the top of the crank case so that no deposit or other foreign matter enters it. After the deposit has been scraped off, the cylinder head, piston and piston ring grooves may be cleaned with a stiff-bristled brush dipped in paraffin. If paraffin is used, it is advisable to wipe it all away before erecting the engine again.

#### REPLACING CYLINDERS.

- 67 Before replacing the cylinders see that the slot in any one piston ring is not opposite that of the adjacent ring, but as far apart as possible. If these slots come in a direct line, it will lead to a leakage of gas. Carefully wipe both the cylinder walls and the piston surface, and then smear them with thick lubricating



Replacing Cylinders.

oil. Gently ease the cylinder on to the piston, as shown in the accompanying illustration, closing each piston ring together with the fingers just as it enters the cylinder. In tightening up the four bolts which hold each cylinder on to the crank case, first rotate the engine so that the tappets are not touching the valves. Screw all the four nuts as tightly as possible with the fingers, then give each nut a half turn with the wrench alternately, so that the tightening is done uniformly, otherwise the cylinder is liable to be strained.

#### TAKING UP STRETCH IN EXHAUST LIFTER CABLE.

- 68 The cable operating the exhaust valve lifter is sometimes found to stretch in use, especially if the machine has been controlled by the exhaust valve instead of by the throttle, as then the





ADJUSTING NIPPLE

BODY LOCK NUT

exhaust valve is used too often. The accompanying diagram shows a section of the cable fixing, also the method of adjustment. To adjust, loosen the lower nut, which is a lock nut, and unscrew the adjusting nipple until the necessary slackness in the cable has been taken up. Then screw back the lower nut to lock the adjustment which has been made. The body part should not move whilst the adjustment is being made, and should be held firm by placing a spanner on the flats and holding it in position whilst the lock nut is either screwed or unscrewed.

## VALVE LIFTER DISORGANISED.

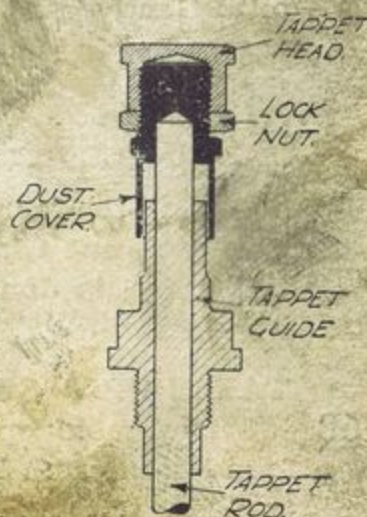
- 69 If any breakage should occur in the valve lifter mechanism, which makes it impossible to raise the exhaust valves by the lever on the handlebar, the machine may be started up by partially opening the compression taps. As soon as there is the slightest sign of an explosion in the cylinders the taps should be closed.

## ADJUSTMENT OF BRAKES.

- 70 We would impress upon all motor cyclists the advisability of keeping their brakes properly adjusted, so as to be always ready for use in case of emergency. The adjustment of each brake will be readily seen and needs no lengthy description.

## VALVE TAPPET ADJUSTMENT.

- 71 The engine valve tappets are of the screwed adjustable type, consisting of a cap or head which can be screwed up or down and locked in position by a lock nut. When the valve is properly closed down on its seating there should be a slight clearance between the tappet head and the valve stem. This clearance should be about  $\frac{1}{16}$  in., or equal to the thickness of an average visiting card. A greater clearance than this leads to excessive noise, commonly called "valve-chatter." Any adjustment of the tappet can be easily effected by unscrewing the lock nut, and then screwing the tappet head up or down, as may be required to give greater or less clearance. When in the right position screw up the lock nut to make the adjustment secure. Both tappet head and lock nut have right hand threads.





## LUBRICATING CYCLE BEARINGS.

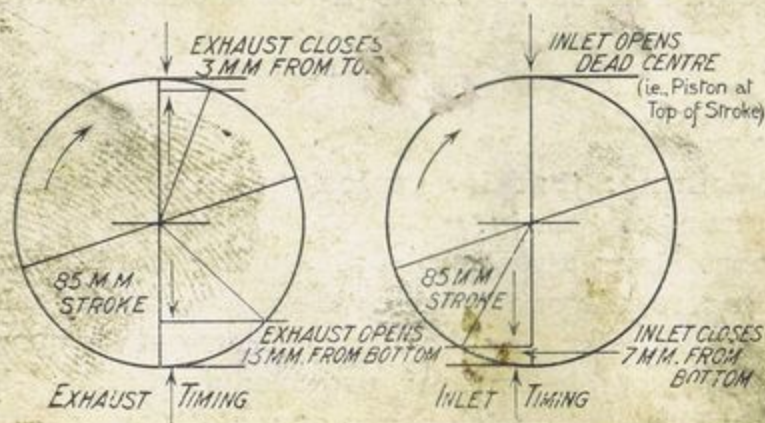
- 72 It is highly important that the cycle parts should be regularly lubricated, as directed in the diagrams on page 9. A good brand of cycle lubricating oil is quite satisfactory for this purpose. The steering head of the motor cycle should be kept properly adjusted, and if there is any play or shake in it (which may be detected by firmly grasping the handlebar and pulling it upwards), the bolt through the handlebar clip should be loosened and the adjusting cone turned until the shake is taken up, afterwards tightening the bolt again. It is not advisable to tighten up the cone until the steering is at all stiff. To adjust wheel bearings see paragraphs 59 and 60.

## INDUCTION PIPE LEAKAGES.

- 73 Frequently, when the carburetter and induction pipes have been dismantled, the unions are not replaced as carefully as they should be, and leakages of air will occur round the unions and flanges. If this happens, it means that a certain amount of air is being drawn into the induction pipe and considerably weakening the mixture from the carburetter. This will make starting-up difficult, as the mixture will probably be too weak to fire. A rough and ready test can be made by pouring oil round the induction pipe joints while the engine is running. If the oil is sucked in, the fault will be at once apparent. These leakages can be remedied by re-fitting the unions, or by wrapping the joints with insulating tape.

## ENGINE TIMING.

- 74 The diagram reproduced on this page shows the valve timing recommended for the Royal Enfield engine, and whenever it may be necessary to retune one of these engines, this diagram should be followed.



recommended for the Royal Enfield engine, and whenever it may be necessary to retune one of these engines, this diagram should be followed. If the timing approximate to this it will be quite satisfactory.

## MAGNETO TIMING.

- 75 The magneto timing recommended for the Thomson Bennett Magneto and Engine is as follows:—With the piston in the FRONT cylinder at the top of its compression stroke, the magneto spark lever being FULLY RETARDED, the platinum points of the magneto should be dividing on Segment No. 2.



## CARE OF THE SIDE-CAR.

- 76 Care of the side-car calls for little comment. It is very necessary for satisfactory running for the side-car to be in perfect alignment with the motor cycle. With the Royal Enfield side-car chassis and attachments it is almost impossible for the machine to get out of alignment, the lugs for the side-car attachments being brazed in to the motor cycle frame. The coach-built side-car body should never be violently rubbed to remove mud and dirt. An old sponge or soft rag dipped in warm water (not hot) will remove any accumulation of mud and grease, and the body can then be dried with a cloth. A little furniture polish will add to the effect.

## STOPPAGES—THEIR PROBABLE CAUSE.

- 77 Whenever the machine stops (either suddenly or gradually) and there is no noise emanating from the engine likely to give any clue to the cause, the first thing it is advisable to do is to see that there is a supply of petrol. Even experienced riders run out of petrol, and occasionally overlook this cause of stoppage. If the petrol supply has given out, and it is impossible to obtain any, endeavour to get a supply of paraffin. By lifting the front wheel of the machine, what petrol is left in the tank will flow to the carburettor, and be sufficient to start the machine again, whilst when it is warmed up the paraffin will enable one to reach the nearest supply of petrol. When running on paraffin it will probably be found necessary to completely close the extra air lever, and in any case no high rate of speed should be attempted.

If there is plenty of petrol in the tank a rapid survey of the whole machine should be made. Some probable causes of stoppage are given below.

## SOOTED PLUG.

Symptoms—Misfiring, that is, explosions in one or both cylinders not occurring regularly.

- 78 It is usually possible to discover the plug which is at fault by the heat of the cylinders, the one in which the misfiring has taken place being perceptibly cooler than the other. Take out the sparking plug with the adjustable spanner provided in the tool-kit, carefully clean the plug, either with paper or a cloth and a small quantity of petrol. When a plug is very badly "oiled-up," some riders adopt the practice of filling it with a small quantity of petrol and burning it out. See that the space between the central electrode and the outer points is right; there should be just sufficient space between them to take the thickness of an average visiting card, although a slightly wider spark gap than this is often used with advantage.



## PETROL NOT REACHING CARBURETTER.

Symptoms.—Misfiring ; engine stopping frequently, then starting again after the machine has stood for a few minutes.

- 79 This may be due to the petrol supply having run out, as mentioned above, or to some obstruction in the pipe. To take off the petrol pipe, unscrew the union nuts at each end of the pipe. Pass a piece of wire down it, or, if it is a small obstruction, it may be blown clear with the mouth. If there is an ample supply of petrol in the tank, and the carburetter floods readily, there may be some obstruction in the channel leading from the float chamber to the jet. It may also be due to a choked jet.

## CHOKED CARBURETTER JET.

Symptoms.—Easily tested, as, when the needle valve on the top of float chamber is tickled violently, the petrol will not drip from mixing chamber, although it will do so from the float chamber.

- 80 Unscrew the nut under mixing chamber and take out jet. Clean the aperture very carefully so as not to enlarge it. A hair bristle or a fine needle is the safest thing to use, if either is obtainable. If not, the screw-pin from the oil-can may answer the purpose if used carefully.

## AIR LOCK IN PETROL SUPPLY.

Symptoms.—Engine usually stops after a few weak explosions.

- 81 This is caused by the air vent in the petrol filler cap being stopped up, so that as the petrol is drained off from the tank a vacuum is formed. Clean the air vent in the filler cap and blow through the filler hole.

## WATER IN CARBURETTER OR TANK.

Symptoms.—If only a little water has reached the petrol, the engine is subject to occasional misfiring, but if there is much water present there will be continual misfiring and explosions in the silencer.

- 82 If it is due to rain, it is no use taking down the carburetter in the open unless the rain has stopped, as more water will enter by doing so. In some cases it is possible, if the water has only entered the carburetter, to turn off the petrol and run the engine "free" until the carburetter is emptied. If the water has entered the petrol tank there is nothing else to be done but to empty it and replace with a fresh supply of petrol. It is possible to test the presence of water in petrol by pouring a little of the mixture into the hand, when the petrol will evaporate and the water remain.

## SEIZED ENGINE BEARINGS.

Symptoms.—Chiefly preceded by engine "knocks," ultimately engine stopping, and, on attempting to turn, is stiff and probably immovable.



- 83 In cases of piston seizures, the trouble may be caused by the piston warping, although this is very rare. Ninety-nine per cent. of all engine seizures are due to under-lubrication. The obvious remedy is to increase the supply of oil, but if the seizure is a bad one, inject a copious supply of paraffin through the plug holes, and endeavour to turn the engine round, either with the starting handle or by pushing the machine with the exhaust lifter raised. After it has been loosened, drain out the paraffin through the drain tap in the bottom of the crank case, and inject a good supply of lubricating oil. After this treatment the trouble should be remedied, although it is advisable in most cases of seizure to have the engine dismantled as soon as possible, to ascertain if any permanent trouble has resulted. If instructions on lubricating are carefully followed, engine seizures will never be experienced.

#### OVER-HEATING.

Symptoms.—Engine becomes noticeably hot, runs badly and “knocks,” even on slight gradients.

- 84 Over-heating may be due to a variety of causes. In the case of a new machine it will usually be caused by under-lubrication, and is a preliminary to an engine seizure. If an engine has been driven “all out” for a considerable time, this may account for it, and the remedy is either to stop and cool down, or drive the engine slowly for a few miles, giving it all the extra air it will take. Driving on too rich a mixture is another cause—the remedy for which is obvious. In the case of an engine which has been running several thousand miles, the trouble may be excessive carbon deposit. The remedy in such a case is to dismantle the cylinders and scrape off the deposit as directed in paragraphs 65 and 66.

#### IGNITION TROUBLES.

Symptoms.—No spark at plug.

- 85 Fortunately, present-day magnetos are so uniformly reliable that trouble is seldom experienced with them. Occasionally, after a long ride in heavy rain, short circuiting may be caused by the plugs or magneto terminals getting wet. Similarly, oil or grease on the magneto terminals will lead to the same effect. The carbon brushes may also get dirty.

#### THE LUCAS DYNAMO LIGHTING SET.

- 86 We fit this Electric Lighting Set to a large number of our Side-car Combinations, and a brief description of it will be of interest. The makers, Messrs. Joseph Lucas Ltd., issue a descriptive booklet dealing with this system, a copy of which we can supply on request, and the following remarks are based on the information contained in this booklet.

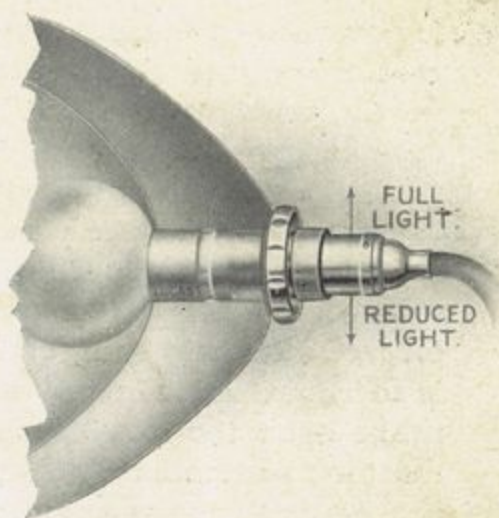
#### DOUBLE FILAMENT BULB.

- 87 The double filament bulb is a standard size bulb containing two filaments, one providing the full driving light for the open



road, the other supplying a reduced light for town use where the full light is not required. Either may be used at will by a movement of the head lamp plug, which is adapted to form a switch.

In addition to this, as all town running is necessarily slow, a brilliant head light tends to withdraw current from the battery in excess of the amount supplied from the dynamo, because the latter is not rotating fast enough to give its full output. In these circumstances the 3 c.p. bulb, consuming only  $\frac{1}{2}$  amp., does not tend to run the battery down, and should ALWAYS be used for town work.



#### FOCUSSING THE HEAD LAMP.

- 88 In order to get the very best illumination on the road, it is absolutely essential that the filament should be focussed properly in the reflector, otherwise, no matter how powerful the bulb, the light obtained will be unsatisfactory. Focussing is a very simple matter and should always be carried out on the road, and not at short range in the garage. To focus the bulb, release the milled nut and move the bulb holder backwards or forwards until the best illumination is obtained, and then tighten the milled nut to secure the bulb holder in position.

#### THE SWITCHBOX.

- 89 The Switchbox has been designed throughout with a view to simplicity and absolute safety. It is conveniently attached to the top tube of the frame, in which position the switch can be manipulated with the greatest ease while the machine is in motion. It is waterproof and dustproof, and is devoid entirely of complicated wiring.

The switch is of the roller type, and is so designed that when the lamps are switched on, the dynamo is also on charge. It should be observed, however, that the switch must always be in the "charge" position during daytime running, except in the summer-time, when the light is not so frequently required.

#### THE BATTERY.

- 90 The battery has a very important part to play in the system, viz., to supply current for the lamps when the dynamo is not running. It is the "reservoir" of the system, which is being frequently "tapped" by the lamps, and should, therefore, be constantly replenished from the dynamo, by keeping the latter on "charge" during daytime running.

The capacity of the battery, or, in other words, the length of time it will keep the lamps going without the assistance of the dynamo,

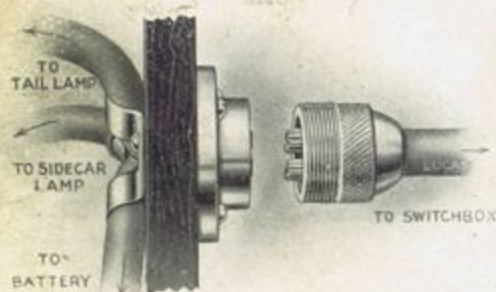


is governed by the size and also by the design ; the maintenance of that capacity throughout the life of the Lighting Set is dependent, firstly, on the manufacture of the battery, and secondly, on the care bestowed by the user. It is this latter point which we particularly wish to emphasise.

A battery may be perfect in design and construction, but it is always subject to diminution in capacity by neglect on the part of the user. During the natural action of the battery water is given off from the acid solution in the form of gases, and this is why it is so important to inspect the acid level regularly, and, if necessary, make good the loss by adding distilled water. This is an easy matter to attend to, and really the only important item in connection with the running of the set.

### SIDE-CAR PLUG.

- 91 A neat plug is provided to be fixed in the side-car to facilitate the detachment of the latter when necessary for repair or adjustment. If light is required when the side-car has been disconnected, the plug can be replaced and repairs proceeded with.



The plug must be screwed well home to ensure a good contact.

### FUSE.

- 92 The fuse is the safety valve of the system, inasmuch as its function is to "blow out" and disconnect the main dynamo circuit in case of accident, such as a broken main wire or loose connection. It prevents damage to the system, therefore, by obviating the excessive flow of current which under such conditions would take place.

The fuse is contained in an easily removable fuse holder placed in the switchbox, and should be inspected occasionally by removing switchbox cover.

### CUT-OUT.

- 93 The electro-magnetic cut-out is really an automatic switch which disconnects the battery from the dynamo when the latter stops running, and makes contact again when the dynamo starts to generate. The value of this is apparent when one realises that, without it, if the charging switch were left on when the rider leaves his machine, the battery would discharge itself completely into the dynamo, causing the user to be in a continual state of anxiety as to whether he had switched off or not.





THE ROYAL ENFIELD  
**MOTOR CYCLE GUARANTEE.**

Reprinted from our current Motor Cycle Catalogue.

*We give the following Guarantee with our motor cycles instead of the guarantee implied by statute, or otherwise, as to the quality or fitness of such machines for the purpose of motor cycling; any such implied guarantee being in all cases excluded. In the case of machines which have been used for "hiring out" purposes, or from which our trade mark or manufacturing number has been removed, no guarantee of any kind is given, or is to be implied.*

**WE GUARANTEE**, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship, but this guarantee is to extend and be in force for three months only from the date of purchase, and damages for which we make ourselves responsible under this guarantee are limited to the replacement of any part which may have proved defective, but not to the cost of any work involved in effecting such replacement. We undertake, subject to the conditions mentioned below, to make good at any time within three months any defects in these respects. As motor cycles are easily liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse or neglect.

The term "misuse" shall include amongst others the following acts:—

1. The attaching of a side-car to the motor cycle in such a manner as to cause damage, or calculated to render the latter unsafe when ridden.
2. The use of a motor cycle, or of a motor cycle and side-car combined, when carrying more persons or a greater weight than that for which the machine was designed by the manufacturers.

Any motor cycle sent to us to be plated, enamelled or repaired, **whether the repairs are required for the purpose of making good the defect before referred to or otherwise**, will be repaired upon the following conditions:—*i.e.*, we guarantee that all precautions which are usual and reasonable have been taken by us to secure excellence of material and workmanship, such guarantee to extend and be in force for three months only from the time such work shall have been executed, and this guarantee is in lieu and in exclusion of any common law or statute warranty, and the damages recoverable are limited to the cost of any further work which may be necessary to amend and make good the work found to be defective.

## CONDITIONS OF GUARANTEE.

If a defective part should be found in our motor cycles **or in any part replaced**, it must be sent to us by carriage paid, and accompanied by an intimation from the sender that he desires to have it repaired free of charge under our guarantee, and he must also furnish us at the same time with the number of the machine, the name of the agent from whom he purchased, and the date of the purchase, **or the date when the alleged defective part was replaced, as the case may be.**

Failing compliance with the above, no notice will be taken of anything which may arrive, but such articles will lie here at the risk of the senders, and this guarantee, and any implied guarantee, shall not be enforceable.

We guarantee only those machines which are bought either direct from us, or from one of our duly appointed agents, and under no other conditions.

We do not guarantee the specialities of other firms, such as Tyres, Saddles, Chains, Lamps, etc., or of any component part supplied with our motor cycles, or otherwise.

**THE TERM "AGENT"** is used in a complimentary sense only, and those firms whom we style our "agents" are not authorised to advertise, incur any debts or transact any business whatsoever on our account, other than the sale of goods which they may purchase from us; nor are they allowed to give any warranty or make any representation on our behalf other than those contained in the above Guarantee.



## THE 3<sup>H.P.</sup> ROYAL ENFIELD TWIN-CYLINDER MOTOR CYCLE

—the solo motor cycle, par excellence—  
is dealt with in a separate volume.



## THE 2<sup>1</sup>/<sub>4</sub> H.P. ROYAL ENFIELD TWO-STROKE MOTOR CYCLE

is also dealt with in a separate volume.

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*These Handbooks are supplied free to Riders of  
Royal Enfield Motor Cycles.*

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THE ENFIELD CYCLE CO. LTD., REDDITCH,  
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