

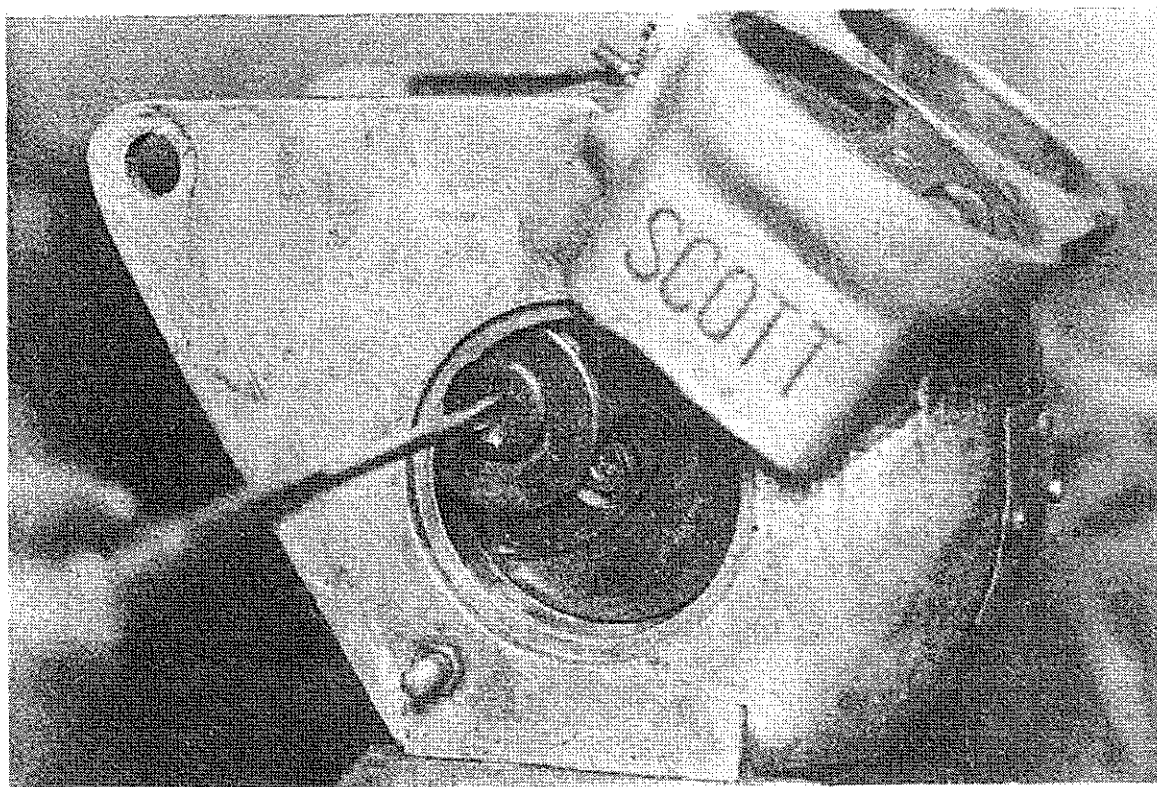
# SPECIAL HINTS ON SCOTT ENGINES

SCOTT GEARBOX AND CLUTCH



# SPECIAL HINTS ON SCOTT ENGINES

By J. H. KELLY (*Scott Motors Ltd.*)



*Fig. 1.—REMOVING THE CRANKPIN SCREW.*

Note how the crankcase door flange is machined away to allow for crankpin screw removal.

## TAKING DOWN A SCOTT ENGINE

**F**IRST, a timely warning: DON'T TAKE OFF THE WATERCOOLED HEAD FOR DECARBONISING—this is only a water jacket, and is distinct from the cylinder itself.

### Removing the Cylinders

Drain water from radiator, take out plugs, radiator (gently please!), remove silencer, transfer covers, cylinder holding-down bolts, carburetter on Supers only (not essential, but allows more room), and on Supers right-hand exhaust port cover. Then lift off the cylinders.

If these are tight, replace plugs, engage gear, open throttle and turn

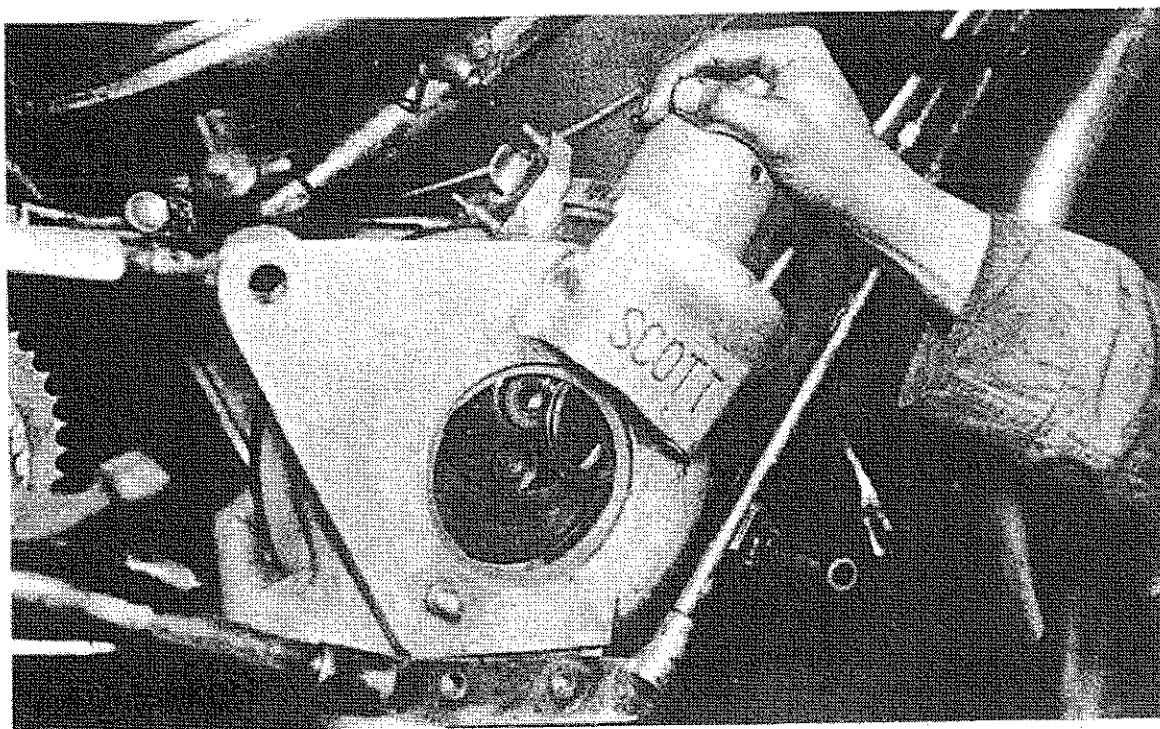


Fig. 2.—REMOVING PISTON AND ROD COMPLETE FROM CRANKCASE.

Note the right hand tilts the rod and the left hand turns flywheel backwards, thus drawing crankpin bush away from con rod.

back wheel *slowly*, until block moves up from the crankcase against compression.

### Crankcase Doors

Having removed crankcase doors (on late Flyers and Replicas these must be removed *before* cylinder bolts can be taken out), remove crankpin screws, stamped right- and left-hand respectively, by using door strap as screwdriver. If these are tight, tap end of strap whilst in screw slot; failing that, tap gently with hammer and light punch. (On Supers and Flyers it will be noted that the crankcase door flange is machined away at one point to allow for removal of screw: it will only come away at this point—don't force.)

### Pistons and Con Rods—Removal

Take out big-end rollers (COUNT THEM IN YOUR HAND—12 EACH SIDE), then turn flywheel to top of stroke—tilt con rod sideways, turn flywheel back slightly—i.e. taking crankpin bush “out of the con rod,” piston and con rod come out together nicely.

All gudgeons (except very old type, split-pinned or lock ringed) tap out from the inside (i.e. flywheel side), and if piston bosses are at all worn, oversize gudgeons *must* be fitted, otherwise the old gudgeons will

eventually float out, with unhappy results to the cylinder walls. (Note.—Oversize gudgeons,  $\frac{1}{10000}$  in oversize, are supplied by works and depot.)

#### Pistons and Con Rods—Adjustment and Repairs

If pistons show signs of having seized, ease off *lightly* with a very fine file, and if cylinders are marked, lap out with crocus powder and oil, but extreme care must be taken to ensure that the cylinders are washed perfectly free of powder afterwards. Don't use your own pistons for this job—beg, borrow, or steal an old one.

When trying pistons and rings in cylinders, put a small wad of paper in the head first, as in some cases it is possible to jam the piston rings if the piston is pushed too far up into the head.

If the rings show more than  $\frac{1}{10000}$  gap, fit new ones (using only genuine Scott rings for the job: cheap rings mean loss of efficiency, and are false economy, anyhow).

Genuine Scott rings are supplied slightly oversize (circumference), and it may be necessary to file slightly to fit (incidentally, radial depth and width are dead right on these rings) inspect your gaps through the ports ;

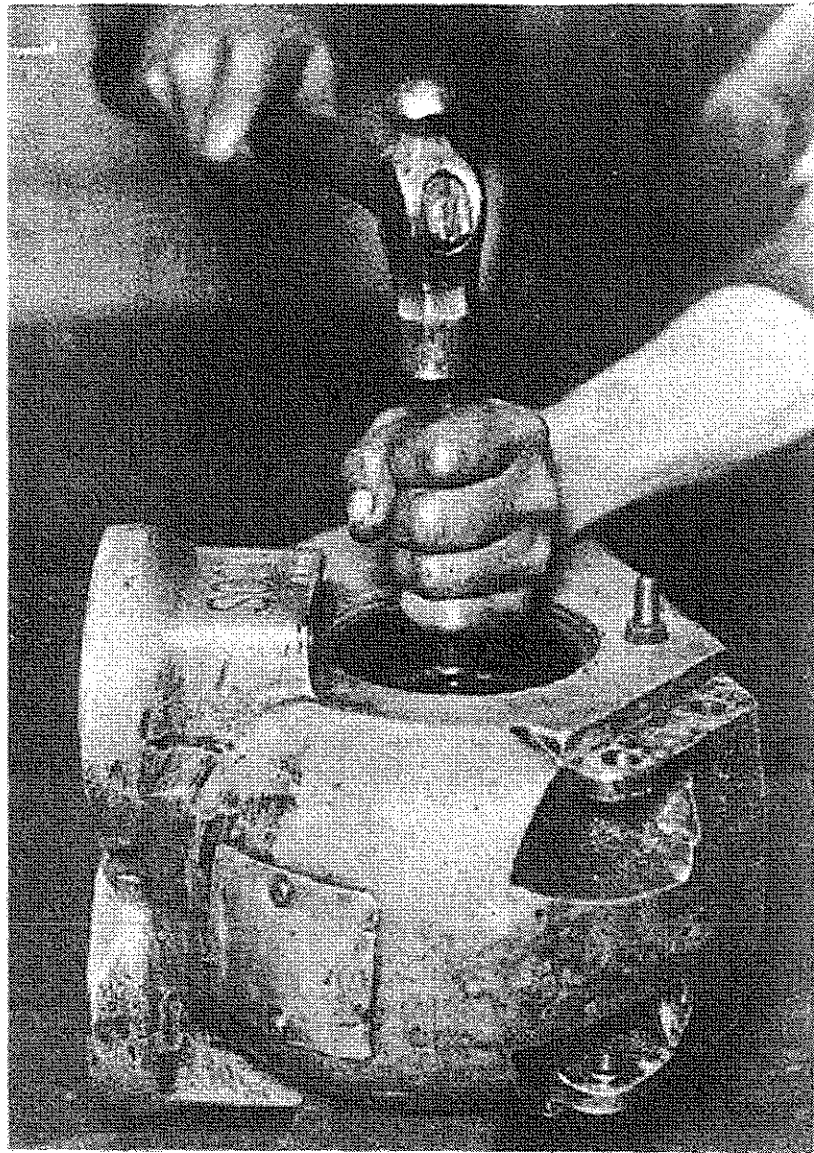
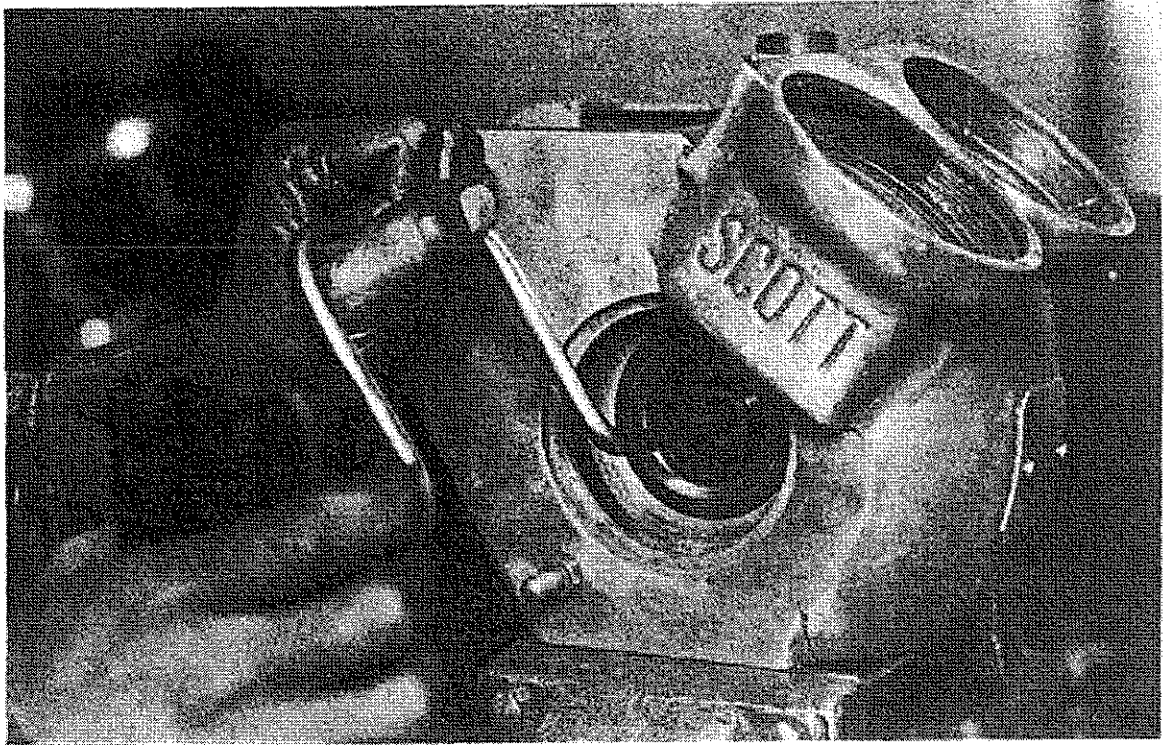


Fig. 3.—REMOVING RIGHT-HAND CRANK.

Note centre bolt is slackened off a few turns, and a sharp blow drives out crank. WARNING: support crankcase on a block of wood first, and see that the crankpin bush on the under side registers with the crankcase cut away—otherwise the flange may get broken when the crank drops out.





*Fig. 4.*—GRINDING IN PACKING GLANDS ON SCOTT ENGINE BEFORE REASSEMBLY.  
The method is described in detail on page 123.



*Fig. 5.*—UNDOING LEFT-HAND THREADED NUT OF CRANKSHAFT BOLT.  
Lay a tyre lever or strip of metal (NOT SHARP EDGES, PLEASE !!) in crankcase as shown,  
and the crank pin bush will rest on it whilst nut is being slackened off.

and remember that old engines wear more at the middle than at the bottom of the stroke, and a ring tight at the bottom may be just right at the top; make due allowance for this, and fit each ring separately.

Clean ring grooves thoroughly, and roll rings round piston; don't have any "sticky" spots (a free ring is very necessary for a two-stroke and one tight ring spoils the whole performance), and if an old ring has been badly seized in, chamfer the piston ring groove edge very slightly.

### Refitting Rings for Fast Work

For "fast" work rings should be fitted with a very small gap and lapped in with jewellers' rouge and oil. The same warning re cleaning your pistons and cylinders applies here.

Engines should be run carefully for fifty miles (a little oil in the petrol is advisable), and if fitted for fast work, one hundred miles.

Use an ordinary penknife or a Woolworth's scout-knife for removing carbon, clean all ports thoroughly, polish your pistons vigorously *on the top only* with metal polish (this will render your next decoke easier), and clean out the oil grooves, but do not polish the sides of the pistons.

### Reassembling Pistons and Con Rods

When replacing con rods, put these back correctly. It is generally assumed that, as long as the small-end bush fixing screw is uppermost, all is well. but it isn't.

A small centre-punch mark will be seen on the side of the rod, at the

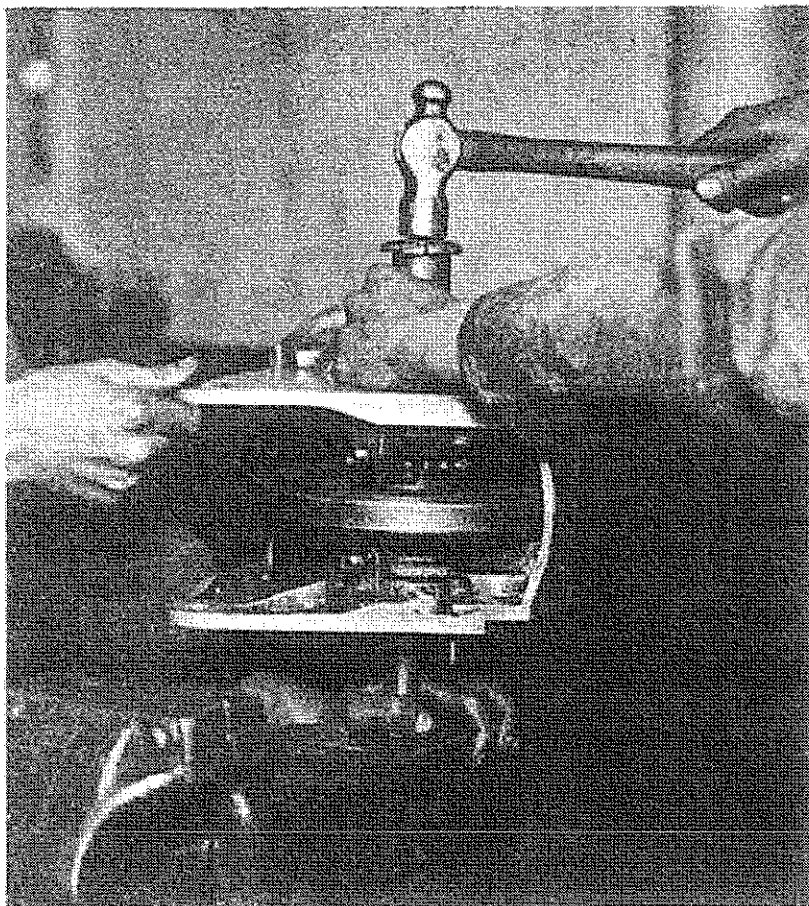


Fig. 6.—BUILDING UP CRANKSHAFT.

After the crank bolt has been screwed up, each crank should be driven into the flywheel, using a hammer and tubular punch.

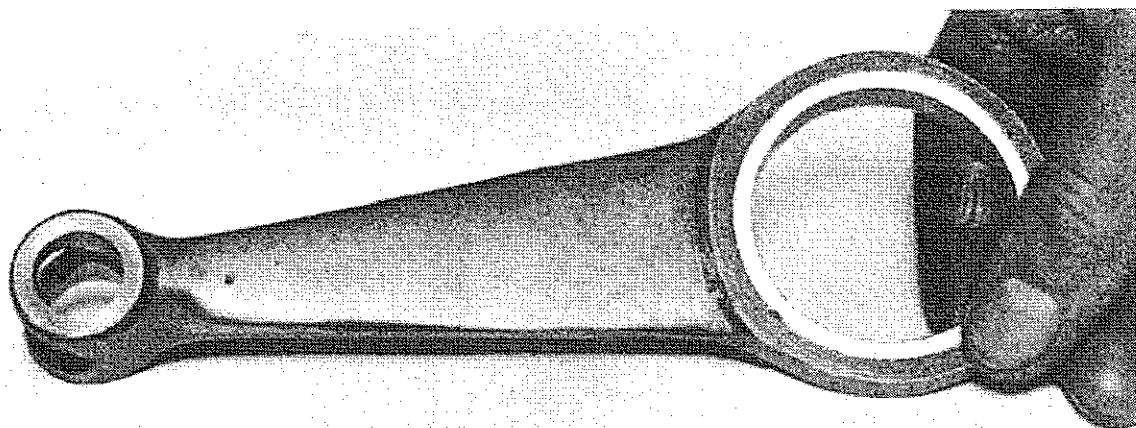


Fig. 7.—SHOWING CENTRE-PUNCH MARK ON CON ROD.  
This side faces flywheel.

top, near the small end, and this should face the flywheel ; keep each rod to its own side of the engine, as they come out.

#### Watercooled Head

If this leaks badly, remove two locking rings and lift off the head ; clean the surfaces carefully, fit new rubber and c/a washers ; use Hermetite or Metalastine, allow to get tacky before putting on the head, tighten the head down evenly and *gently* (remember the head is very thin), and allow to stand for a few hours before filling with water.

It will be found that the head can be tightened a little more after a day or so's running.

#### Did you know this ?

The London Depot of Scott Motors, Ltd., will be pleased to lend a special spanner for these head nuts against a deposit of 10s. ; no charge is made for use and deposit is returned in full. The same facility is given in the case of a half-compression locking-ring tool, the deposit here being 5s.

#### Joints

Always use new packings, these are quite cheap.

All joints should be fitted dry, except base linen rings, on which you may use either seccotine or oil. Trim up transfer and induction washers to the ports, to ensure an even flow of gas.

#### Gauzes

These are fitted to most 596 engines and the early 486 and 532 models, but a little more speed and acceleration may be gained by their removal. If the engine spits badly with the gauzes out, replace them immediately.



### Cylinder Bolts

When tightening down the cylinder holding-down bolts, do these diagonally ; this relieves the " last bolt " of undue strain.

### A Warning—leave the Skirts alone

Many Scott owners, no doubt intrigued by the usual press photos and descriptions of T.T. Scotts, or inspired by those weird and wonderful tuning hints so freely broadcast, have rushed blindly into the practice of cutting away the cylinder skirts below the cylinder transfer ports in order to gain a little more speed and acceleration.

Whilst it is more than likely that this end has been attained, the slow running has been practically destroyed—a little thought will explain why!

Now the T.T. Replica, of course, *is* cut away, BUT *the inlet and exhaust ports are altered accordingly* to balance up for the slow running. This part of the business is never mentioned by the " tuning expert."

Never meddle with these dangerous experiments ; remember the Scott Works and the Depot are always only too willing to give advice on such points : they will be delighted to help you get the best out of your Scott.

## HOW TO TAKE SCOTT ENGINE OUT OF FRAME

Having attended to the cylinders and pistons, it now remains to get the balance of the engine out of the frame, as follows :

Remove engine chains, (engine and/or magneto), four bottom  $\frac{3}{8}$ -inch engine bolts and large top bolt, and lift assembly from frame.

### In the Case of " Flyer " Models

Support crank-case with box or petrol can, remove chains, take out carburetter slides, disconnect clutch wire, remove three main engine bolts, taking out the *top* one last.

For 1928-31 Flyers take out *front* bolt first and

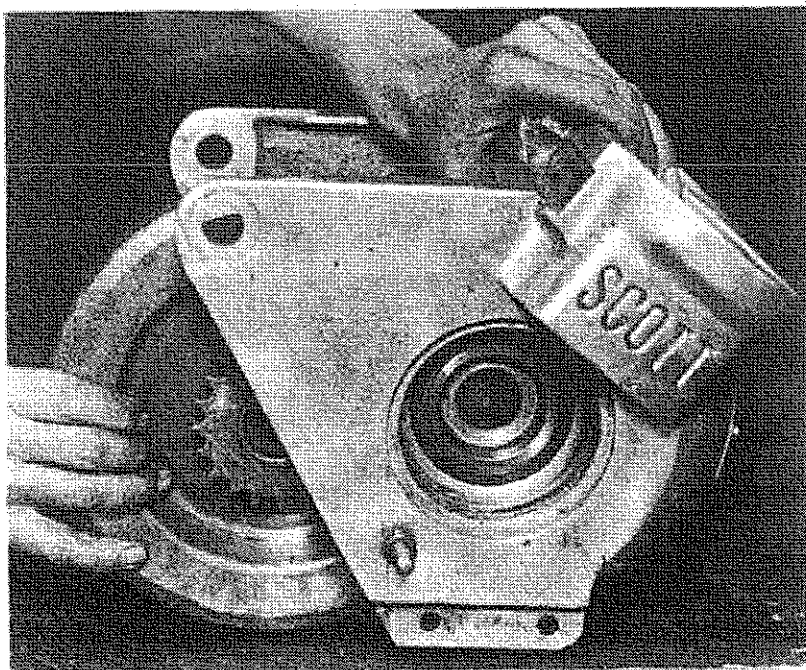


Fig. 8.—CORRECT WAY TO REPLACE FLYWHEEL.  
Note fingers rest naturally in deep rim of flywheel.

remove front stand; when reassembling, put this bolt back first, *without* stand and washers, and after replacing other two bolts, take out front one again and replace stand and washers at your ease. This saves a lot of "juggling" with front stand.

### REPLACING ENGINES (COMPLETE) IN FRAME

Super will go back into frame quite comfortably if the right-hand exhaust port cover is left off.

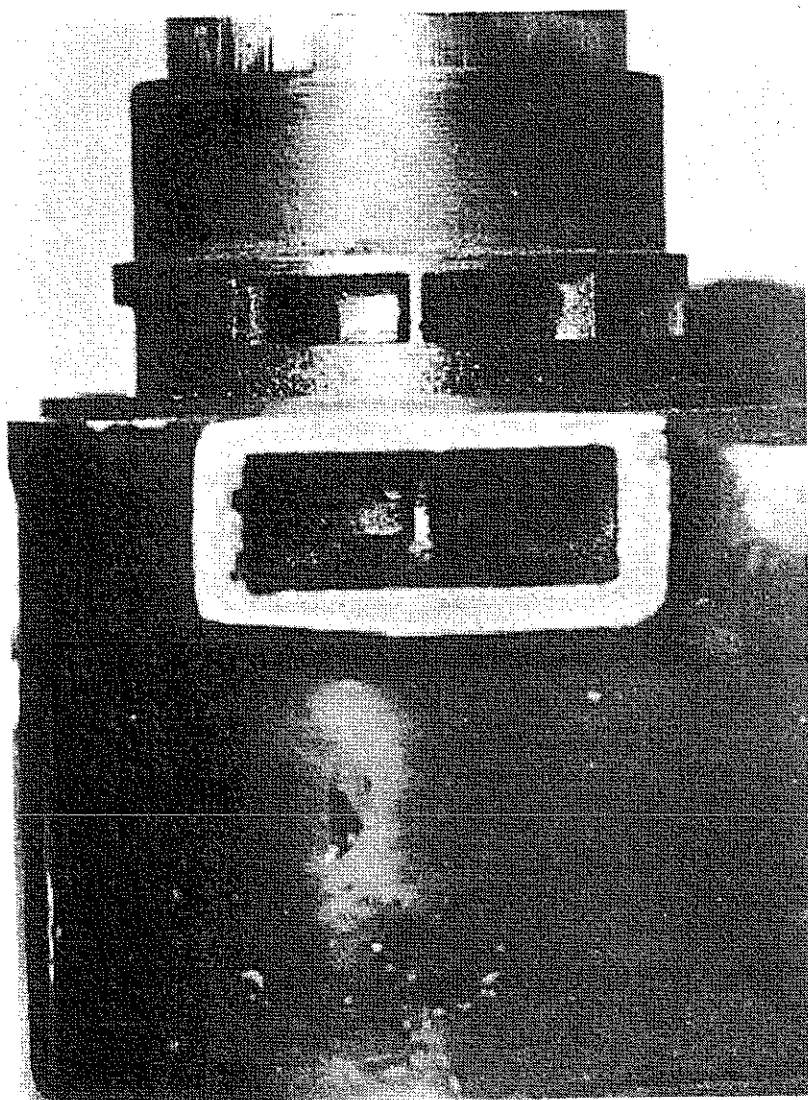


Fig. 9.—IT IS POSSIBLE TO EXAMINE THE PISTON RING GAP THROUGH TRANSFER PORT.

### "Flyer" Models

These should be put in upside down and swung up into position (see Fig. 10), fitting front bolt (only) first (see note *re* 1928-31 Flyers above).

Incidentally, it is worth while taking out the gearbox at the same time on these models, as on removal of two gear tray bolts and nuts, sprocket housing complete, two underneath nuts to gearbox studs, the tray can be swung downwards and the whole gearbox dropped through the frame—an extra five minutes' work! This will also save discon-

necting the gear chain, which will come out with the engine.

### A Note on the Threespeed Super

In this particular job it is far simpler and easier to remove engine and gearbox on the undertray in one unit—but don't forget to remove the clutch wire first—so easily forgotten!

## DISMANTLING CRANKSHAFT

A delicate job, but quite straightforward. Proceed as follows: unscrew LEFT-hand nut in centre of right-hand crank, undo bolt on left-hand side a few turns (right-hand thread), a smart blow on the bolt head will dislodge crank; bolt can then be unscrewed, releasing right-hand crank and rollers. (COUNT THEM—SUPERS 13, and FLYERS 15.)

The left-hand crank can then be removed by a steel bar passed through the flywheel, giving it a smart blow.

Take great care in replacing cranks; a little grease (vaseline) will hold

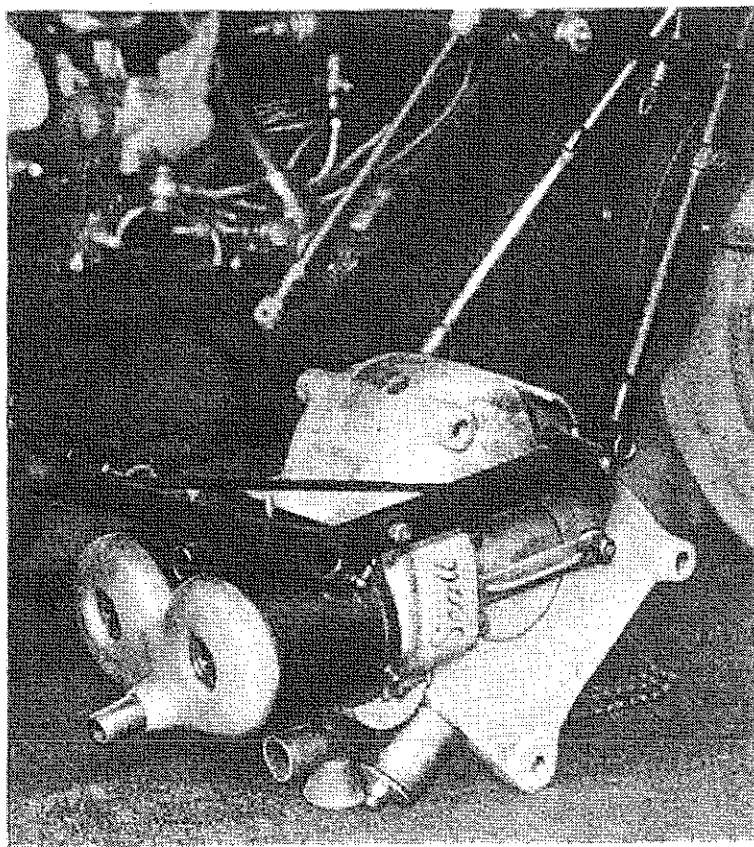


Fig. 10.—FLYER ENGINE READY TO SWING UP INTO FRAME.

the rollers in position (bed these down on the bearing by passing a piece of string round the outside of rollers, when in position, and tighten), replace packing gland (after grinding this in with a little *fine* valve-grinding paste or knife-powder, see Fig. 4) and be sure that the tongue of this engages with the keyway in the flywheel.

After the crank bolt is screwed up, each crank should be driven into the flywheel, using a hammer and tubular punch (three sharp blows only).

## Warning

Whenever hammering up a crank, the other one *must* be in position first and a solid mass brought to bear up against it, so that the force of the blow is not transferred to the crankcase cup.

Each crank must be knocked up in turn and crank bolt tightened a little, and cranks *MUST* be driven up solid to flywheel, otherwise the flywheel key may shear.

Always use a new crankshaft bolt and nut, as these tend to "stretch," and left-hand thread is invariably damaged.

When tightening up bolt and nut, don't overdo it; the left-hand nut may need to be thinned down to clear the large hole roller plate. See

that the latter seats firmly on the crank, then check that it really clears the nut ; rivet the nut over lightly to prevent working loose.

When replacing flywheel, see that this is put back right, i.e. the fingers of the right hand fall naturally into the groove of the rim. *Flyers*, the thin sprocket will be on your right (magneto chain drive).

The sprockets usually last for years, but can be replaced for a few shillings, and are only riveted on to the flywheel. (20-tooth only supplied.)

If main bearings or cups are worn, the cranks and crankcase must be returned to the works for new parts to be fitted, as these are not supplied separately.

### Big Ends

If your bushes or rollers show signs of pitting or "scaling" they should be replaced. (Works and London depot will rebush or exchange rods and cranks for you at a reasonable charge.)

*Don't waste your time or money on oversize rollers*—rebushing is not expensive, and the Scott engine, as an engineering job, surely deserves a better fate than faking up big ends!! When you realise that explosion force does not wear the bushes *evenly*, you *must* see that the oversize rollers are altogether wrong!!

## GENERAL NOTES ON SCOTT ENGINES

### Air Leaks

These can generally be found by squirting petrol around the various joints ; pulling off each plug lead separately will instantly show which cylinder is weak, although a blown carburetter (induction pipe) washer *may* lead you badly astray (check this first)!

Intermittent firing or cutting out on one side may be due to cracked pick-ups (H.T.), but more elusive is the burnt contact-breaker points, or loosening of same ; early Lucas Magdynos are peculiarly sensitive on these points. Too wide a gap at the plug or magneto points is another cause.

### Plugs for Scott Engines

A very debatable point this ! but a just golden rule. *If you are satisfied with your present plugs, DON'T change, stick to that type.* Apart from this, here are the recommended types.

### GENERAL AND TOURING

Champion No. 13 (for 1929-31 Flyers, No. 7).

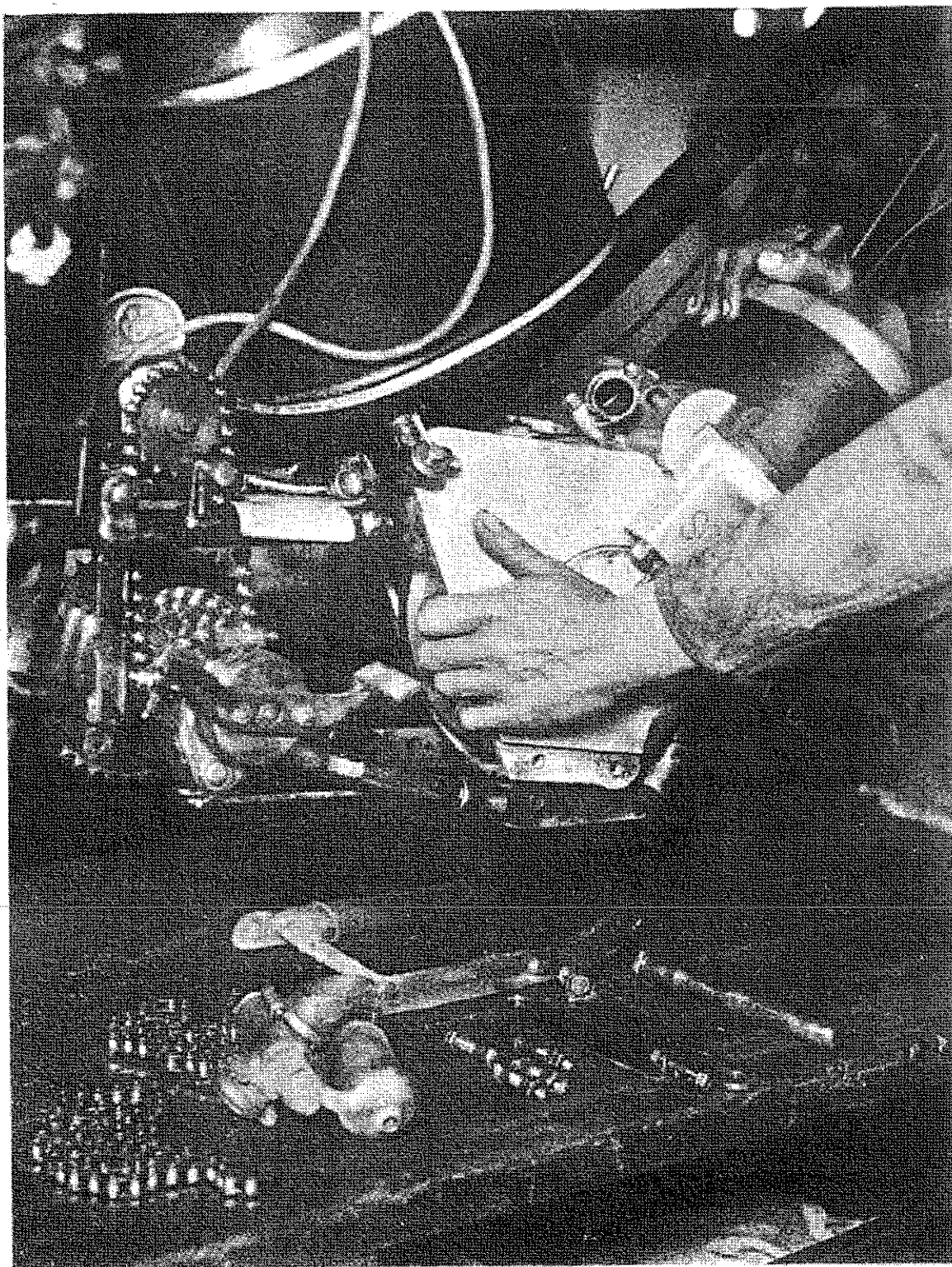
### FAST TOURING

K.L.G. H.S. 3.

Lodge H.H. 1.

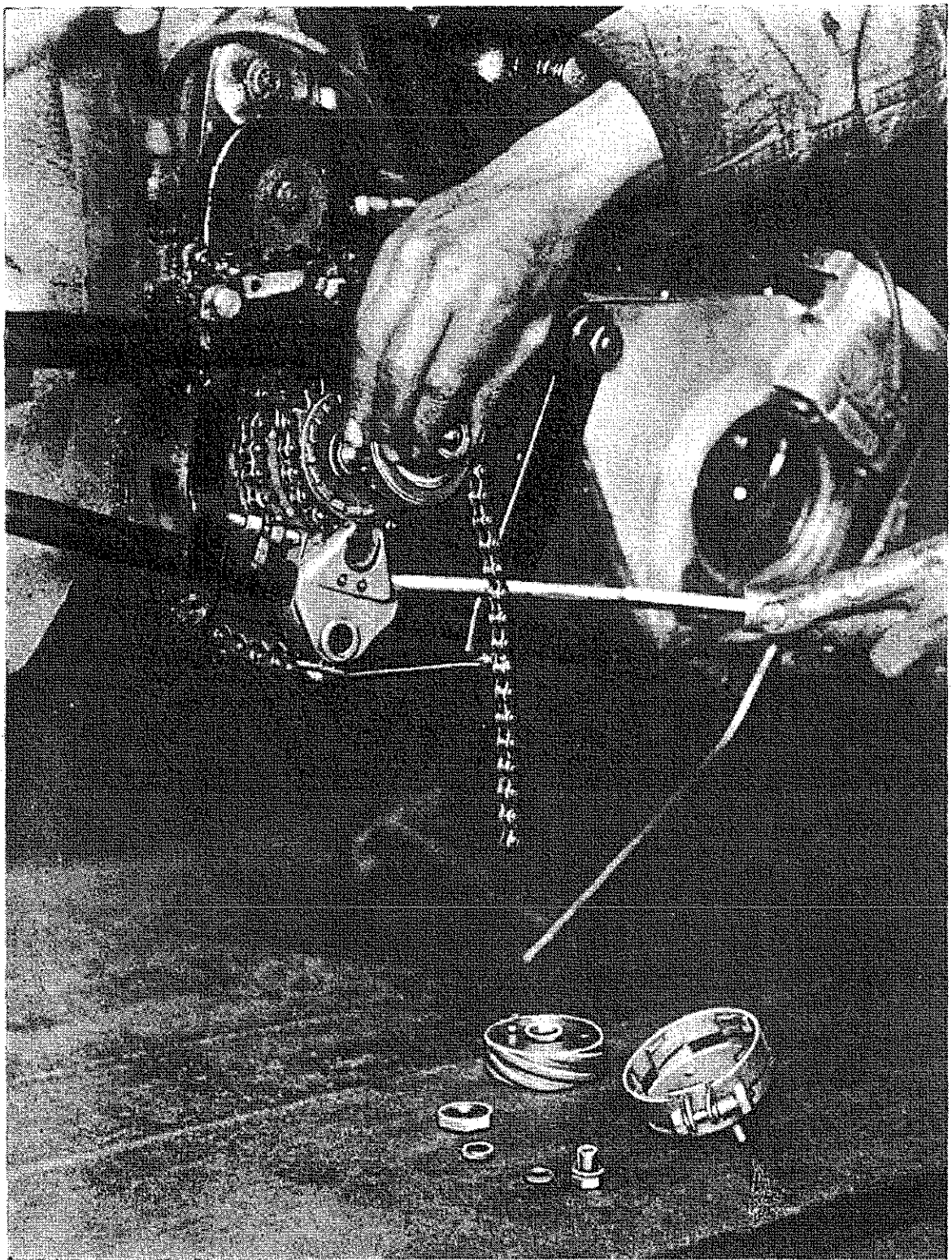
Champion Aero A (for 1927-8 Flyers and T.T. Replicas only).





*Fig. 11.*—LIFTING SUPER ENGINE OUT OF FRAME.





*Fig. 12.—SHOWING REMOVAL OF KICK-STARTER DEVICE.  
Lifting gear with screwdriver and sliding off device.*

## RACING

K.L.G. 268 and Champion Aero A.

## Warning

Plugs with a longer reach than  $\frac{3}{4}$  inch must not be used ; damage to pistons is the penalty !

## Timing

Take out plug, set piston at top of stroke, retard ignition lever fully, set contact-breaker points just fully opened. If you have timed off the wrong cylinder, this will be denoted by a backfire in the silencer ; it is then necessary to change over the plug leads.

## Oil

Use Castrol XXL (or "runners up" Castrol XL, Duckhams' Adcol R.R.).

## Petrol

Any good brand of No. 1 (OR BETTER STILL 50 per cent. petrol to 50 per cent. pure benzole). For T.T. Replicas, ethyl.

Decoke new engines, 1,500 miles ; afterwards, 2,000 to 4,000 miles, according to model.

## Scott Radiator

Perished hoses and rubber pads for bolts should be renewed, and in the event of a new hose weeping, a few turns of insulation tape round the brass water pipes will cure this.

The water system should be flushed out occasionally with warm water and soda to remove any deposit.

To prevent freezing in cold weather add about a pint and a quarter of ordinary commercial glycerine to the radiator water. If you cannot get glycerine, empty the radiator by the drain tap in the cylinder, but make sure that it is empty, as if there is a rust deposit at the cylinder end it is quite likely that it will block up the drain tap.

For a small honeycomb leak, stop this up with a piece of chewing gum (*after* you have chewed it !)—this is quite a good tip, as you can get this anywhere on the road, where you probably could not get Plasticine. Have the leak repaired as soon as possible (corrosion sets in very quickly and spreads) by a skilled radiator repair man. DON'T TACKLE IT YOURSELF.

## Silencers for Scott Machines

The Howarth silencer, fitted to Flyers, etc., is very prone to choke up after the oil pump has been set on the liberal side (such as a new machine

or rebore), and it is advisable to take this to pieces (three) and clean out thoroughly after 600 miles ; easiest method is to burn it out over an ordinary gasring or blowlamp.

In any case, clean regularly every 1,000 miles.

For increased efficiency and to minimise back pressure, you may increase the small  $\frac{1}{4}$ -inch hole at the end of the cone (inside portion) to about  $\frac{3}{8}$  inch, and on the Flyers, which already have the expansion chamber at the front, the outer baffle of the inside part may be entirely removed, *but* this latter idea is not conducive to real silence, although careful driving (i.e. no hectic blinding in first or second gears !) will see you through.

### Oil Pump Setting (Pilgrim)

Oil pump settings are usually a nightmare to the "new owner," and the "so many drops per minute" idea bewilders him more than ever, so we suggest the following as a more certain method.

On new (or rebored) engines, set the pump to give one drop of oil at every third pulsation at the "beak," i.e. one, two, then drop.

After running in, it can then be reduced to one drop at every fourth pulsation, i.e. one, two, three, then drop. (Or even less by that time, as obviously you will have got into the "swing" of things.)

The exhaust, of course, is a reliable guide—excessive blue smoke means too much, absence of smoke not enough.

A faint haze at low speeds (lift the half-compression lever momentarily and it should give an extra "puff") is fairly safe, but just remember that if you are too generous in adding oil to your petrol, you may be smoking profusely, but not getting enough oil to the mains and big ends via the oil pipes ; so be very careful on this point.

### A Useful Repair Hint

To replace worn engine chains, it is easier to attach new chain to old one and "follow on." If no old one is available, remove top engine eplates, smear first dozen links of chain with stiff grease and thread over engine sprocket (this allows the chain to cling to the teeth instead of "piling up" at the back of crankcase). In the case of 1931 Flyers and Supers, this greasing is not necessary, as a chain guide is now provided.

## OTHER SCOTT FEATURES

The Scott Kick Starter, Twospeed and Threespeed Gearboxes, the Clutch, Chains and Cycle Parts will be dealt with in later articles.

# SCOTT GEARBOX AND CLUTCH

By J. H. KELLY (*Scott Motors Ltd.*)

## SCOTT TWO-SPEED GEAR

**T**HIS is removed quite easily from the frame as follows : Disconnect kick-starter chain from rear end, take out hollow bolt in left-hand gear lug, remove footrests (for "freedom"), rear chain, gear pedal, sleeve nut and washer, outer drum and strap, washers on shaft (note the order in which they come off), undo  $\frac{5}{8}$ -inch shaft nut and remove inner drum, lift up gear, take off kick-starter device complete, and slip off chains ; drop gear through bottom of frame (see Fig. 1).

### Dismantling Gear

Undo slotted ring on ratchet side (right-hand thread), lift off high gear drum, expanding ring, distance washer and ball cage. Take out two pivoting screws in the thrust lever (you will note locking washers on these ; when replacing screws always fit new washers), lift off thrust lever, low gear drum, ring distance washer and ball cage.

Take off locking ring at driving end (also right-hand thread), lift off sprocket (located by two flats on the hub). Cones are accessible, take off cone at *this end first*. As the cups are a drive-in fit, a light tap on the hollow shaft (insert hollow bolt a few threads first) will carry out the whole spindle centre thrust and cup complete (Fig. 2).

### Centre Thrust

The two large nuts and thrust washers are threaded on to the sleeve (right-hand thread), and should any of the washer cages, the sleeve or the thrust block itself show signs of pitting or wear, fit new parts. (The sleeve is riveted through the hollow shaft to the solid spindle.)

### Reassembly

The sleeve *must* work freely on the spindle ; see that no play is allowed on the centre thrust and main bearings, but that all run freely ; thin steel washers are supplied for cone adjustment (short end of shaft) to allow the cones to be tightened up against the shoulders of the shaft. (*Note.*—There are 50 balls,  $\frac{3}{16}$  inch, in the gear, 24 in the thrust assembly and 26 in the main cups, even number each side.) **SPECIAL NOTE.**—Put the balls back loosely : don't use grease to "place" them : this only blocks up the oilways and causes trouble.

### Lubricate Drums with Paraffin

The quick thread drums should be lubricated with paraffin only and the strap adjusted carefully, as this makes a deal of difference in the

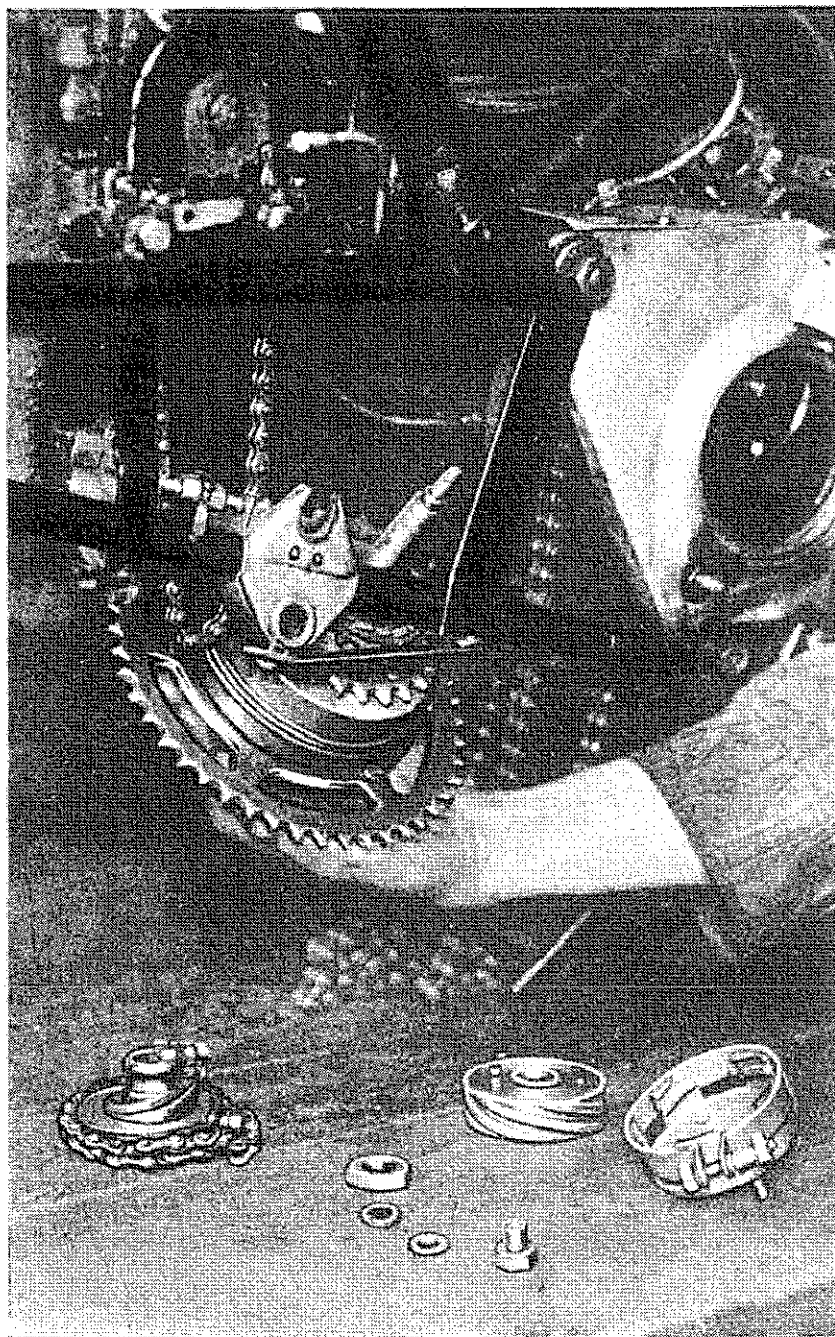


Fig. 1.—HOW THE GEAR DROPS THROUGH THE FRAME WHEN DISMANTLING.

sweetness of engagement; if both gears slip unless you have your foot on the pedal, this proves that the strap is too slack, so tighten up slightly. Don't put too much pressure on the sleeve nut when tightening — remember it is only a  $\frac{1}{4}$ -inch thread, and very easily broken off.

The thin  $\frac{1}{4}$ -in. washers on the thrust rod are for pedal adjustment: increasing the number will engage *low* gear with *less* movement of pedal, and decreasing the number will allow the pedal to go down *farther* into low gear, high gear being affected accordingly (Fig. 6.) Oversize rollers are supplied to take up wear, but don't rush to these immediately ; re-

member that play on the cones or centre thrust (an excessive amount of neutral on the gear pedal usually indicates this) will be taken up by the *whole gear moving bodily*, before the rollers enter the drums.





Fig. 2.—REMOVING THRUST ASSEMBLY FROM GEAR HUB.

Insert a hollow bolt for a few threads. A light tap on the bolt will drive out the assembly.

to the hub flange on the outside (19-, 20-, 21-, and 22-teeth sprockets are supplied).

These sprockets are held on the flange by a lock ring (right-hand thread) and a set screw (also right-hand). On unscrewing these, the sprocket may be removed and another replaced.

See that the locking ring and set screw are *tight* when replaced.

It is not necessary to take the gear out of the frame for this job; remove locking ring and screw, take out hollow bolt and distance washer and sprocket can be removed. When replacing the hollow bolt, take care that you do not cross the threads.

### SCOTT KICK-STARTER

This is of course a separate unit from the gear itself, and can be removed without taking out the gear, as follows:

Sideplay on the gear drums (up to  $\frac{1}{16}$  inch permissible) can be taken up by means of a slightly thicker side plate distance washer.

### Changing Gear Ratios (Two Speed)

This can be done by changing the sprocket fitted

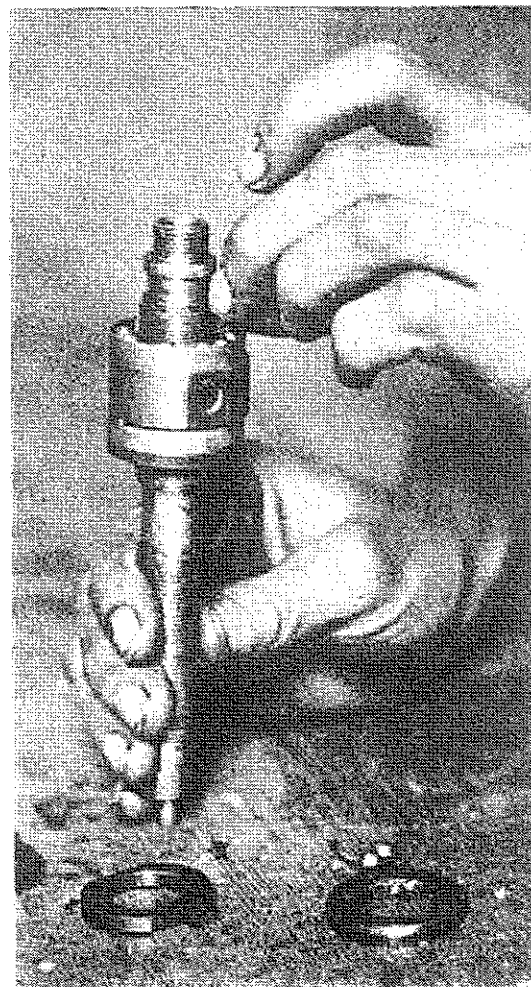


Fig. 3.—PLACING BALLS IN CENTRE THRUST.

Don't use grease to "place" them.

Detach chain from rod, take off gear pedal and drums, slacken off left-hand gear lug clamping bolt and gear chain adjuster nuts, undo gear oil pipe ; gear can then be tilted and the kick-starter pulled off.

When refitting, take out sparking plugs to allow engine to rotate easily, slide kick-starter on shaft, refit gear into frame. (*Note.*—See that the two small pins on the back of the inner quick thread drum fit snugly into the slots in the gear lug, otherwise difficulty will be found in getting the gear pedal adjustment correct.) Attach a piece of cord to the chain, wind round ratchet about  $1\frac{1}{2}$  turns (clockwise), bringing loose end to

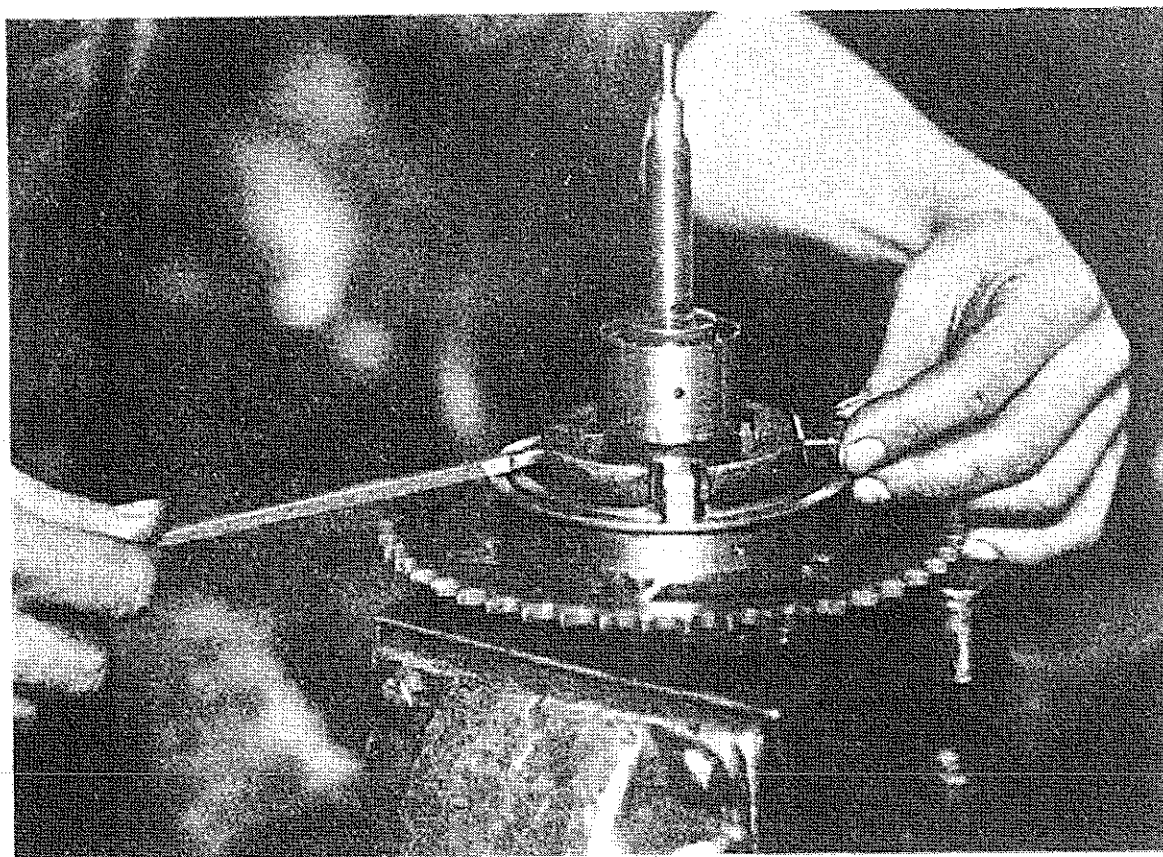


Fig. 4.—HOW TO LOCATE THRUST LEVER SCREWS.

rear ; engage high gear and pull cord, turning rear wheel forward, until chain anchor is within  $\frac{1}{8}$  of a revolution from top.

Hold ratchet in position with a screwdriver wedged between it and frame, attach starter chain to rod, withdraw screwdriver (Fig. 5).

*Just one warning here.*—On no account turn the rear wheel backwards, as this will damage the spring.

Adjustment of rod and chain is made by the link at the end of the rod (attached to the lever), and in rest position the ratchets should be just clear of each other. If you find that no amount of adjustment will clear ratchets, remove kick-starter and fit one or more thin gear cone washers

between the ratchets on the shaft; this will then throw them clear of each other.

If the kick-starter sticks at the end of the stroke, this may be due to dirt or want of oil. Clean out thoroughly with petrol, and give copious supplies of oil; failing that, it is possible that the small 2 B.A. nut holding the chain eye on the ratchet drum has become loose and has turned round, fouling the gear lug on the down stroke. This nut should be riveted over and filed flush with the edge of the drum to prevent this.

### SCOTT THREE-SPEED GEARBOX

This requires little attention above the usual oiling, but we will dismantle for safety.

Remove kick-starter screw and cap and hold the spring with a pair of pliers, pull it off the pin, release spring. Take off kick-starter cap (the notched one), *left-hand* thread, and kick-starter stop by detaching sleeve nut. Then kick-starter itself will pull off by rotating in a forward direction until the pawl "rides" on the boss.

The ratchet bolt and washer can now be removed (right-hand thread) and ratchet taken off its square; now take out the three remaining cover sleeve nuts.

A smart tap on the end of the mainshaft will break the cover joint (assuming that the sprocket housing has been taken off, of course); continue tapping the shaft and the end of gearbox will come off with the middle- and low-gear wheel assembly. Assuming that the "innards" don't come out with the cover, withdraw layshaft, slip off middle- and low-gear wheel assembly from mainshaft. Mainshaft can then be with-

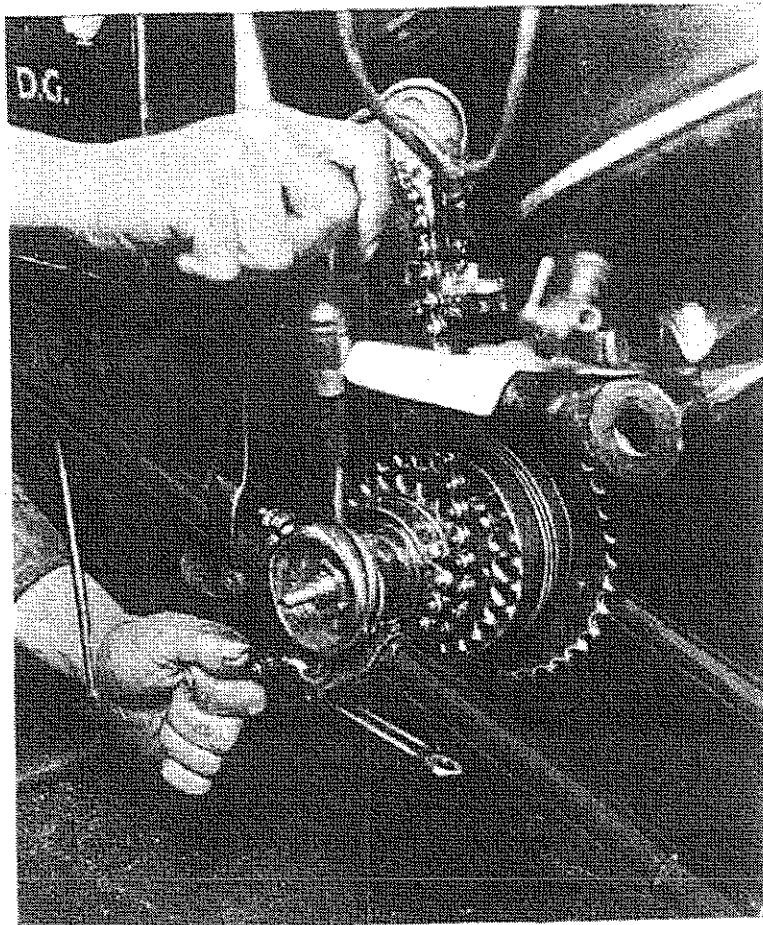


Fig. 5.—CONNECTING UP KICK-STARTER CHAIN.

After giving spring a full turn, jamb screwdriver between gear lug and device to hold in position.

drawn, which will allow sliding dog to fall free ; take care that you collect the small fork shoes, which may drop out of the fork.

High-gear wheel can only be removed after clutch is dismantled. When reassembling, be sure that all parts and joints are perfectly clean, making cover joint with Metalastine.

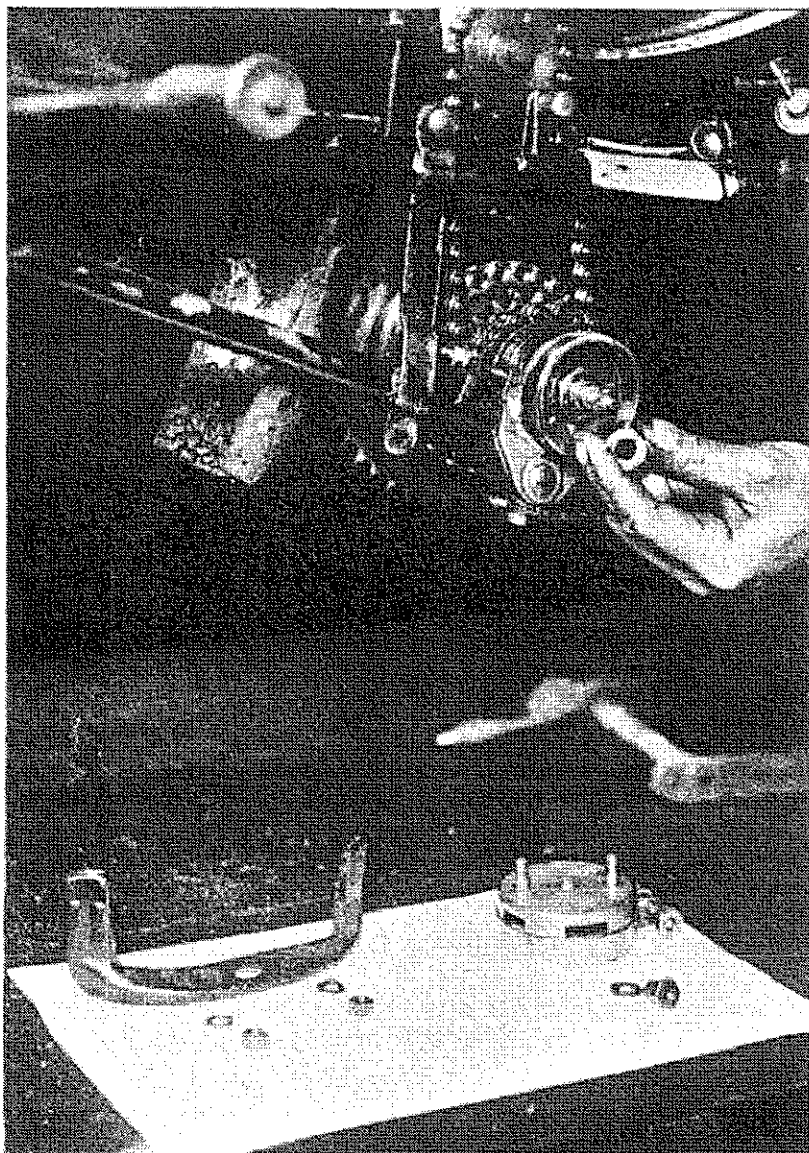


Fig. 6.—ORDER OF GEAR-PEDAL WASHERS.

Plain  $\frac{1}{4}$ -inch washer is on shaft and  $\frac{3}{8}$ -inch double-coil washer in hand ready to put on. Ordinary  $\frac{1}{2}$ -inch spring washer and sleeve nut are put on after outer drum is fitted.

washer must be prised off the flat face of the nut first), pull off race plate, then the ball-thrust race, washer, clutch worm lever and spring.

Should the thrust washer be worn this may be reversed, as may also the corresponding washer which is fitted in the lever itself, these being case hardened ; if they are pitted, reverse at once, as once this has started

## THE SCOTT CLUTCH

### How to Dismantle

This can be dismantled, if required, without disturbing the gearbox by just removing the sprocket housing and rear chain and then carrying on as follows :

Remove hexagon nuts (or screws, according to type) and clutch springs (6), and the whole clutch body and plates will come away together. Take care that none of the race rollers (30 Flyer and Super) fall out and get lost.

If you wish to get at the clutch operation worm, take off race-plate locking nut (the edge of its locking



it will wear quickly, with the result that a lot of waste movement is set up on the lever before the thrust pins touch the outer plate and "clutch drag" sets in.

#### Reassembling the Scott Clutch

When reassembling, be sure that the race-plate nut is tight and the locking washer turned over. It will be as well to note the condition of the felt washer inside this nut, as if this is hard or perished, oil will tend to creep along the mainshaft and cause clutch slip (i.e. if gearbox is too generously filled).

The order of plates is as follows: (1) small plate; (2) plate with inserts, two similar groups, then the outer plate. Springs should be replaced, tightening them in pairs diametrically opposite each other; lock the nuts by split pins or a length of copper wire.

#### Don't burn Oil off Inserts

If at any time you wish to examine plates without taking gearbox out of frame, make sure that you hold the clutch body in position (if solo, lean machine over on right-hand footrest), in order that the rollers do not drop out from their cage. If you get clutch slip through oil-saturated inserts (this may happen if you overfill the gearbox, which by the way should only be filled up to the oil boss plug, about half-way up on the gearbox cover), let the plates soak in petrol for a few minutes, brush vigorously and "rough up" with a file. **DON'T BURN THE OIL OFF**, this only buckles the plates and swells the inserts; if you think the inserts too bad or worn, replace one plate (next the *outer* plate) with new inserts (about three shillingsworth).

Just another point: it may be advisable, after many thousands of miles' wear on the inserts, to grind the thrust pins down a little, but these *must* be done evenly, otherwise you will get a "cockeyed" action and clutch drag, but on relining the plates with *new* inserts you must fit standard pins (the others of course being now too short).

#### On Supers

If the plates get too saturated, fit four new Ferodo linings, putting one of these immediately behind the race plate, and if clutch tends to slip under heavy sidecar work, put a thin washer under each of the six springs (this tensions them a little), although this will necessarily make the clutch a little "heavier" in action.

#### Lengthening the Life of Clutch Wires

Many people consider that the heavier the clutch cable the longer the life. Well, this may be, but a light clutch wire does not necessarily mean a short life—what it does mean is a really light action. The writer has



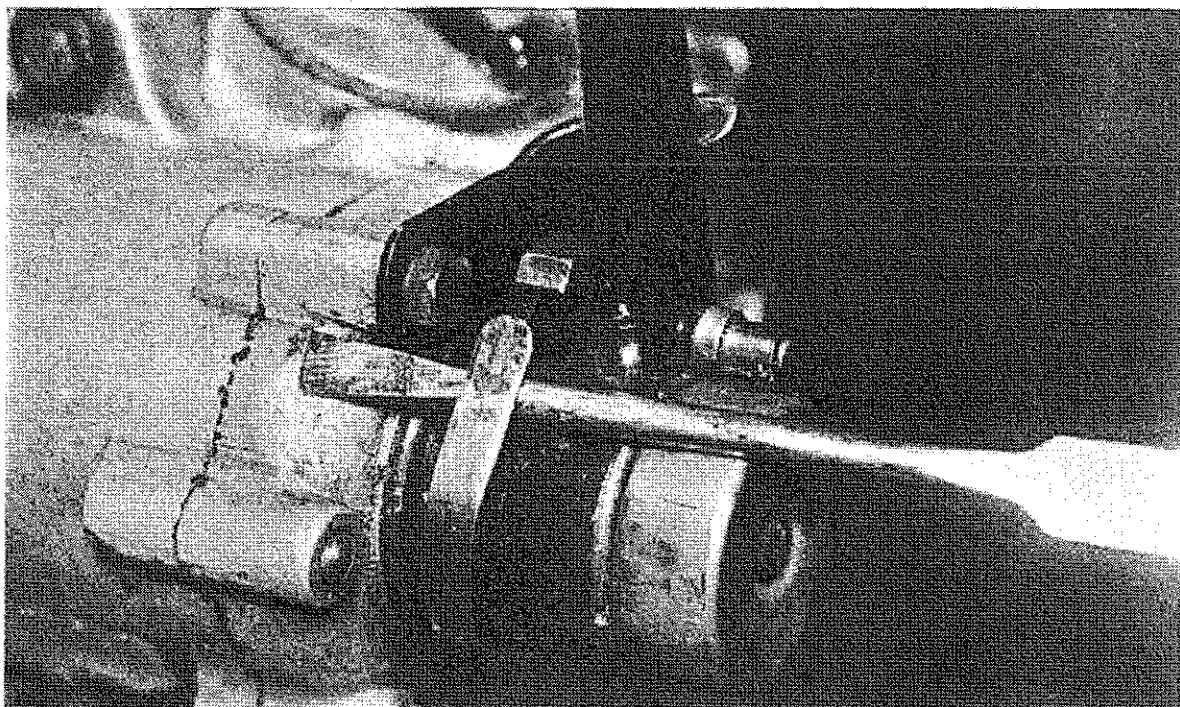


Fig. 7.—LIFTING UP PAWL SPRING.

To replace pawl which has jumped out after violent backfire.

the original light clutch wire on his Flyer and sidecar—used quite a lot in London traffic (Londoners will appreciate this point!)—which has seen nearly eighteen months' service. There is nothing wonderful about this, and the secret (if you can call it such) is a  $\frac{5}{16}$ -inch round nipple at the top end which *floats* in the lever, i.e. not jammed in, as, sad to relate, we see so many, cable oiled frequently (particularly at the adjuster, half-way along the cable), and the top nipple and first few inches of inner wire *thoroughly greased* periodically against the rain rust.

#### Alter Gear Ratios when Fitting Sidecar

The gear ratio can be changed in about twenty minutes, by taking off the sprocket housing complete, remove end plate which screws out, unscrew sprocket lock nut, and tap out sprocket from ballrace—refit new sprocket by reversing process.

#### Scott Kick-starter Trouble

If this slips it is usually due to dirt on the pawl or broken ratchet teeth; in any case, it is a matter of minutes to take it to pieces and examine. Worn pawls or ratchets should be replaced. If, after a backfire, the kick-starter slips, you will find that the pawl has "jumped" from under the long clip spring around the kick-starter body; lift this spring up with a screwdriver and replace pawl. The spring will automatically press pawl back into engagement (see Fig. 7).