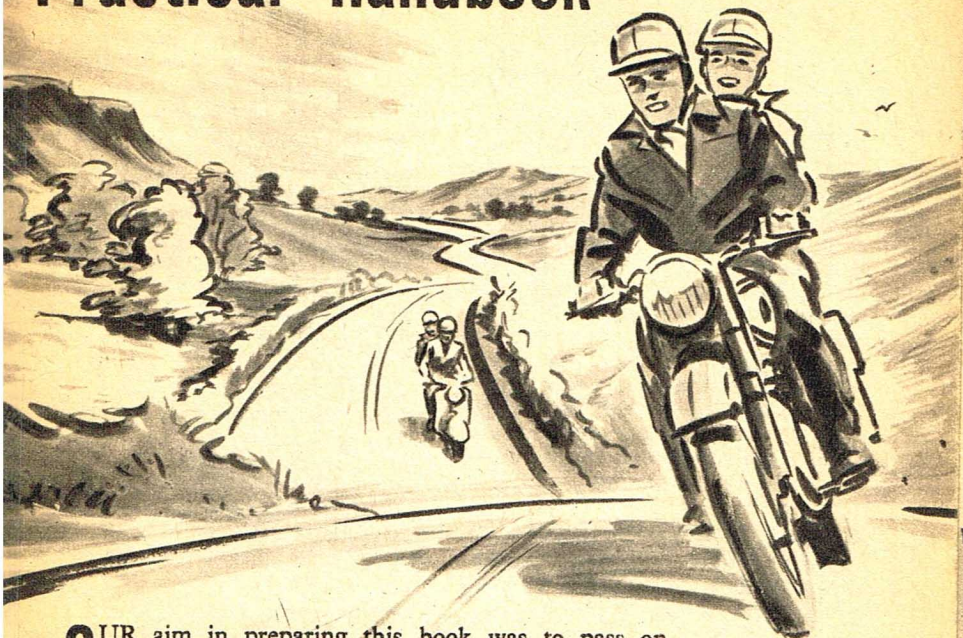


THE  
MOTORCYCLE

# Practical Handbook



**O**UR aim in preparing this book was to pass on practical, helpful information and advice. All the suggestions are based on long experience. Many of them have come from famous riders; others from fellow readers and members of *The Motor Cycle* staff. We know that, as well as proving of interest, this handy book will help you to get the best from your machine and the utmost enjoyment when awheel. Some of the hints will enable you to do jobs yourself and, therefore, save you money.

Regular readers of *The Motor Cycle* know that, in addition to all the helpful material we publish week by week, we offer a personal information service. It is open to everyone, and if you have a query of any sort on which you think we can assist, why not write to me? The only stipulation is that you enclose a stamped, addressed envelope.

HARRY LOUIS, *Editor*

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"THE MOTOR CYCLE," DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1



### PISTON-RING REMOVAL

Distortion or breakage can be avoided when piston rings are being removed if they are peeled out of their grooves with a penknife blade. The blade is slipped under one end of a ring which is then pushed by means of the left-hand thumb up on the piston land above the groove. Running the blade round the piston lifts the remainder of the ring out of its groove and up on to the land. The ends of the ring are then prised slightly apart so that it can be lifted up over the piston crown.

### SLOT OR SOCKET HEAD?

When a timing-case cover or primary chaincase defies attempts to keep it oiltight, the reason may be slight

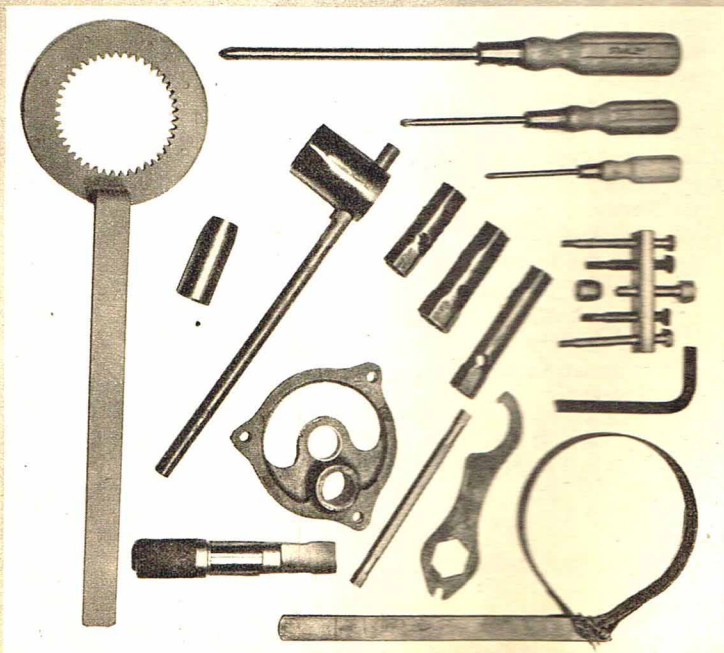
distortion of the joint faces. Where there are no facilities for truing the faces up a satisfactory seal can often be obtained if the slotted-head fixing screws are replaced by others having socket heads. The latter type are tightened by means of a tommy bar and hence rather more purchase can be obtained. The screws must not, of course, be tightened to the extent of stripping the threads.

### AIR-FILTER CLEANLINESS

Certain types of dust aggravate plug whiskering; manufacturers' recommendations with regard to the cleaning of carburettor air filters should therefore be closely followed.

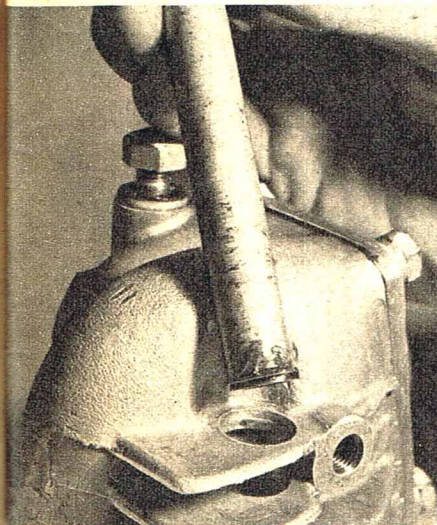
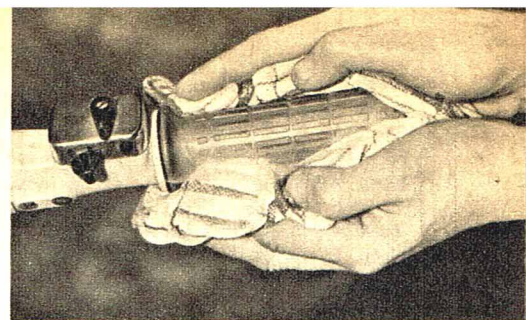
### SERVICE TOOLS

It is not generally realized that special tools for simplifying jobs of major overhaul are available for most models from factory service managers. The selection illustrated has only recently come on the market for that thrilling, all-enclosed twin-cylinder two-fifty two-stroke—the Ariel Leader.



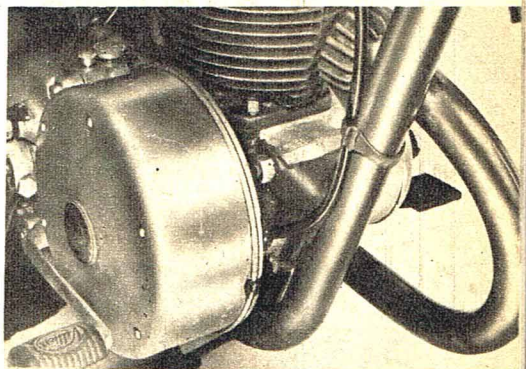
### PLASTIC HANDLEBAR GRIPS

Removal of plastic handlebar grips in cold weather (when the plastic is very hard) is simplified if the grips are first warmed by wrapping round them a rag soaked in near-boiling water. The new grips should be similarly heated before fitting.



### WET H.T. LEADS

If in wet weather water runs down the high-tension lead and enters the pick-up of a flywheel magnet, the lead can generally be rerouted so that it loops below the level of the terminal an inch or so from the back of the instrument. Water then drips off the lead at the lowest point on the loop. High-tension leads can be similarly rerouted should they direct water on to the sparking plug or plugs.

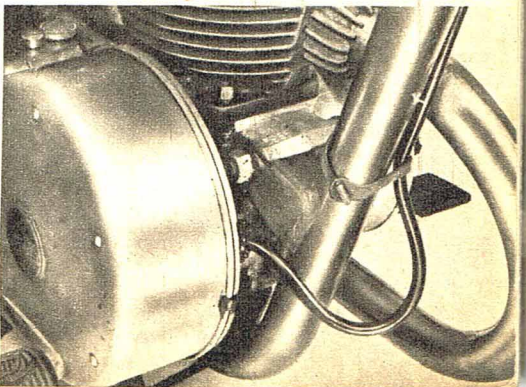


### HOLDING A WASHER

To hold an awkwardly placed washer in position while a stud or bolt is being fed through it, use a blob of grease; the grease will hold the washer temporarily to the surface against which it is to bear.

### HOT-PLUG TIP

Here is a tip that will save both time and burnt fingers when a plug has to be changed at the roadside. Carry in the tool box a short length of rubber tube just large enough in diameter to allow it to be slipped over the plug insulator. As soon as the initial slackening has been done with the plug spanner the rubber tube is slipped into position and enables the plug to be unscrewed rapidly with the fingers.

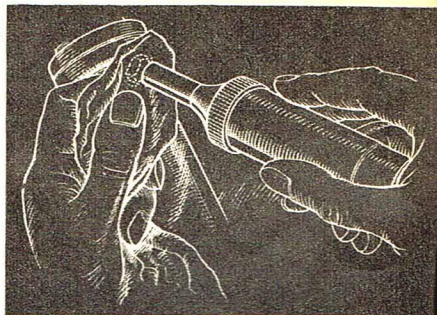


## GREASING UP

Even when a grease nipple is clean and free from grit, it is often difficult to prevent grease from oozing out between the gun nozzle and nipple. An improved seal can be obtained if a piece of clean, soft cloth is placed over the nipple and the grease is forced through it.

## ACCIDENT PROCEDURE

After an accident the first duty of a road user is to stop. For the purposes of the law an accident is an event causing damage or injury to a human being, a vehicle or to one of



the following animals: horse, cattle, ass, mule, sheep, pig, goat, dog. After stopping, the rider must give his name and address to anyone having reasonable grounds for requiring the information. If no one asks for his name and address he must as soon as practicable, and in any event within 24 hours, report the matter to the police. Where there is injury to some other person the insurance certificate, if not shown at the time, must be produced at a police station within five days.

## PETROL TAP ON?

Have you ever pondered the reason for push-pull type petrol taps having one round head and the other hexagonal? The scheme is adopted so that whether the tap is turned off or on can be readily determined by touch. When the hexagonal head is in, the tap is turned on. (Hexagon. Get it?)

## CHAIN RATTLE

The rear chains of some oldish models run uncomfortably close to back mudguards, and metal-to-metal contact may occur even when the chain is in correct adjustment. Attaching a thin rubber patch to the mudguard by means of Bostik will prevent unwanted clatter.

## GREASE-FILLED GEAR BOXES

Where a gear box is lubricated by grease it is a good scheme to add a

small quantity of oil. By that means there is adequate lubrication even when the gear box is cold and the grease perhaps solidified to the extent that the pinions merely cut grooves in it.

## GAPPING A PLUG

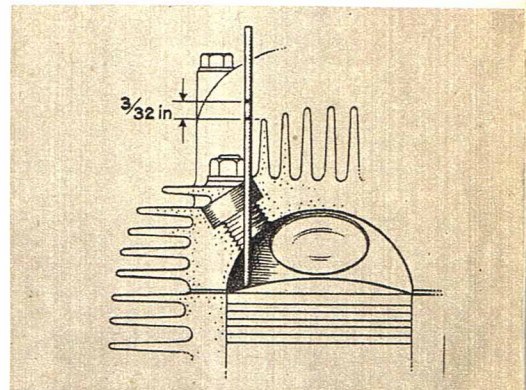
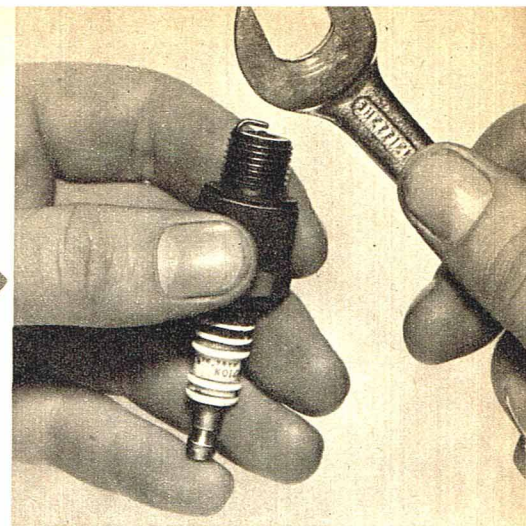
Whether a sparking plug has three earth (side) electrodes or one the method of setting the gap is similar. The No. 1 rule is that in no circumstances should the high tension or centre electrode be disturbed. The side electrode or electrodes are soft and can be moved closer to the centre electrode by gentle tapping with a spanner or farther away from it by levering under it with a small screwdriver or penknife. Recommended plug gaps vary almost with every individual engine. The gap for your particular model will be quoted in the instruction book and it should be checked by the gauge supplied in your tool kit or by means of a blade in a set of feeler gauges, available from tool shops.

## GARAGE CONDENSATION

Steel and corrugated-iron sheds are subject to condensation in cold weather and when humidity is high. A cure is to paint the walls with glue size and then sprinkle them copiously with cork dust (obtainable from most fruit shops). The cork adheres to the tacky size and insulates the metal.

## FINDING TOP DEAD CENTRE

It is not always necessary to lift the cylinder head to time an engine accurately. A simple gauge for determining piston position in relation to top dead centre can be made from a piece of  $\frac{1}{8}$ in-diameter steel rod or from part of a discarded spoke. The rod is passed vertically down through the sparking plug boss so that it rises or falls with the movement of the piston. A nick is filed on the spoke to line up with an adjacent cylinder-head fin and another, above it, to indicate the correct amount of piston travel be-



low top dead centre at which the contact-breaker points should begin to separate. Timing can then be carried out in accordance with the details in the instruction book.

## BOTTOM-GEAR ENGAGEMENT

If bottom gear is reluctant to engage when the machine is stationary with the engine running, ease the machine gently backward and forward. This serves to bring the gear-pinion dogs into line so that they mate readily. Alternatively, try easing the clutch momentarily into and out of partial engagement.



### SELECTING JUNK

Miscellaneous nuts and bolts stored in a tin have usually to be poured out on to the bench and then replaced, by the handful, when the sought-for nut or bolt has been found. But if the contents are wrapped in a piece of polythene sheet before going into the tin the entire selection can be withdrawn, searched through easily, and replaced in seconds only.

### PILOT-LIGHT TELL-TALE

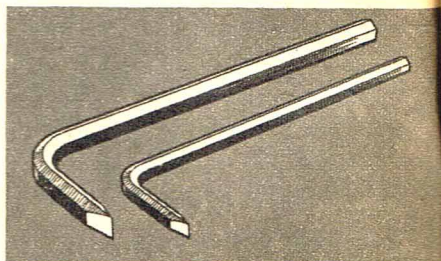
In these days of fairings which carry the lamp unit well ahead of the front fork, it is very often impossible to pass a hand across the headlamp to check whether the pilot bulb is lit. One solution comprises a small circle of Perspex, about the size of a half-penny, attached to the tip of a pennant standard fitted to the front mudguard. The reflected light from the lamp is thus readily spotted. When the handlebar screen is not of streamlined, fairing pattern, the plastic disc can be mounted lower and closer to the mudguard blade, through a small angle-bracket.

### WHEN TO DECOKE?

It is a widely recognized fact that, where two-strokes are concerned, the way in which an engine is driven and the ratio of oil to petrol employed have an important bearing on when decarbonizing is necessary. Performance, rather than mileage covered, must be the criterion. Since any falling-off in power output owing to carbon formation is inevitably gradual, it is sometimes difficult to detect. Hence a check should be made on a hill on which "clean-engine" performance is known or by means of an acceleration test.

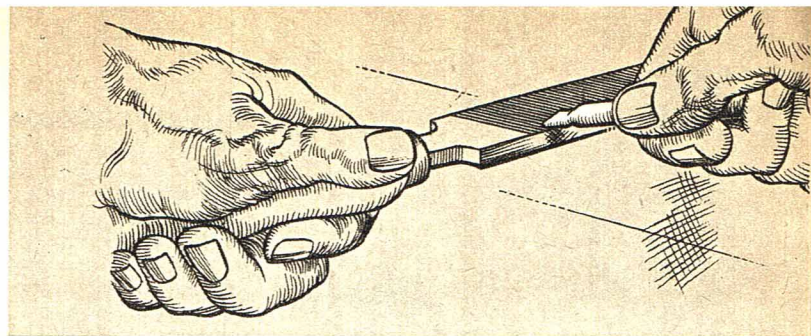
### PISTON-RING WEAR

The correct piston-ring end gap is about 0.003 to 0.004in per inch of cylinder-bore diameter. If the gap is as much as three times that figure, or if the ring has any brownish patches indicating blow-by, a replacement should be fitted. It is false economy to refit doubtful rings; replacements are inexpensive and often serve to put the edge back on performance.



### WORKSHOP TOOLS

Excellent carbon scrapers can be made from hexagonal-section keys for socket-head screws. The keys are of different sizes and with their shorter arms ground to a chisel edge they are excellent for cleaning up, for example, the ports in a two-stroke cylinder. More than that, key scrapers of small size make useful screwdrivers for inconveniently placed screws such as those of a lighting switch, ammeter or horn.



### SWELLING CLUTCH PLATES

Some clutch materials—notably Neoprene—have a tendency to swell when they are very hot, as may happen when the clutch is abused during fast standing starts, or in dense traffic. When the inserts heat up the clearance at the cable increases. In no circumstances, however, should the slack be taken up, for as soon as the clutch cools the clearance returns to normal. The necessary free movement— $\frac{1}{2}$ in at the handlebar lever—should be set only when the clutch is cold.

### DUSTING DOWN

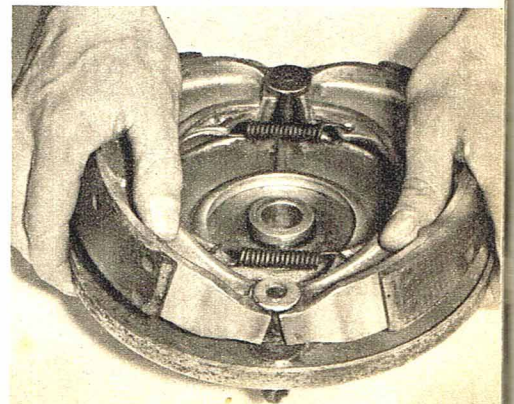
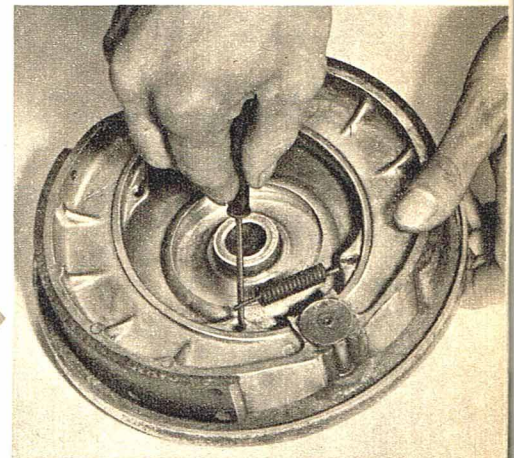
Every under-stairs cupboard conceals a feather duster. When it has served its purpose in the house it will prove excellent for flicking dust off your scooter, motor cycle or sidecar.

### FITTING BRAKE SHOES

To ease the task of fitting brake-shoe pull-off springs, the outside spring (where one is fitted) should first be slipped off the cam lever to allow the cam to return to its "neutral" position. A thin-blade screwdriver is then slipped through the free end of one pull-off spring and its tip placed on the eye of the shoe. The screwdriver is then tilted so that the spring slides down the blade and into position. Repeat the process for the other spring. Another scheme, which applies particularly when the springs locate in holes instead of hooks, is to tilt the shoes to form a vee and fit both springs. The shoes are then placed in position on pivot and cam and given a sharp downward push.

### CLEANING FILES

Inevitably files become clogged after a time, especially if they have been used on soft metals. One method of cleaning out the teeth is to take a short piece of copper or light-alloy tube, flatten one end and file it square and then rub it over the file in the direction of the teeth.





### CROSSED THREADS

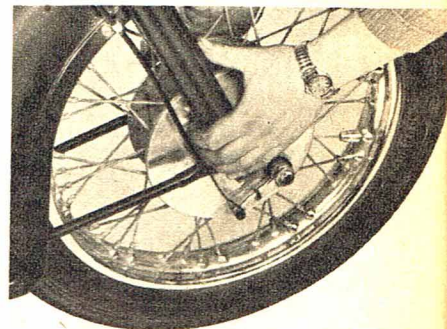
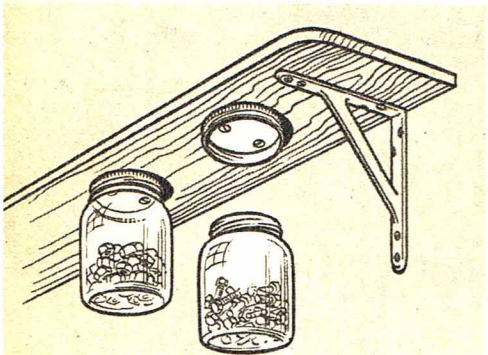
Should a screw be entered cross threaded it will be felt to tighten after only a few turns. There is no need to scrap the components. The first few female threads are removed by means of a drill as shown. The damaged threads on the bolt or screw are then eased down with a file. Naturally, care must be taken to ensure that sufficient length of thread remains to give a satisfactory hold.

### MIND THE OIL

With scooters—indeed, with any two-stroke—weakening the carburettor mixture to achieve lower fuel consumption means reducing the amount of lubricating oil being fed to the engine. It is unlikely that the reduction will be enough to cause damage but it will be as well to raise the oil content—say, from 1 in 20 to 1 in 16.

### OFF THE BENCH

In order to keep stocks of odd bolts, nuts and washers out of the way, a few glass jars with screw tops are modified as follows. The metal caps are drilled to take two small wood screws and are fixed to the underside of a workshop shelf—or even under the bench. The most suitable size of jar measures about 3½ in diameter × 5 in deep—and jars are better than tins because their contents may be seen at a glance.

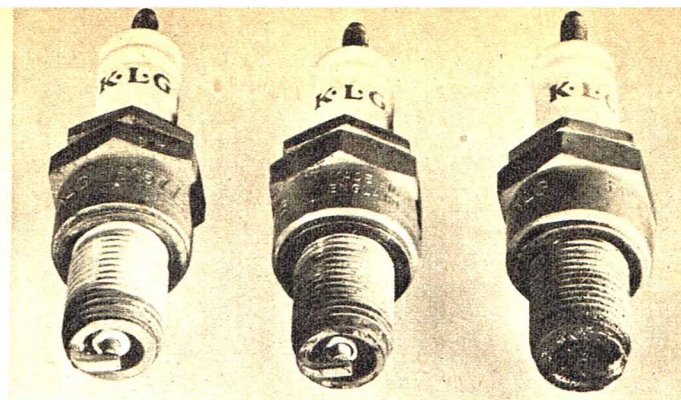


### WORN FORK BUSHES?

There are several simple methods of checking for wear in telescopic-fork bushes. But perhaps the best scheme of all is to raise the front wheel clear of the ground, then stand in front of the machine. Reaching down, grasp the fork legs at their lowest extremities; by gently pushing and pulling play at the bearings can be felt.

### DOWSING A FIRE

Happily, motor-cycle fires are rare these days. Usually they occur when a machine is being kick-started—when flooding petrol is ignited by a spit-back of flame through the carburettor. The tactics for dowsing are first to turn off the petrol and then to start the engine and rev it, so sucking the flames into the cylinder or cylinders. If kick-starting does not get the engine going quickly, waste no time before run-starting.



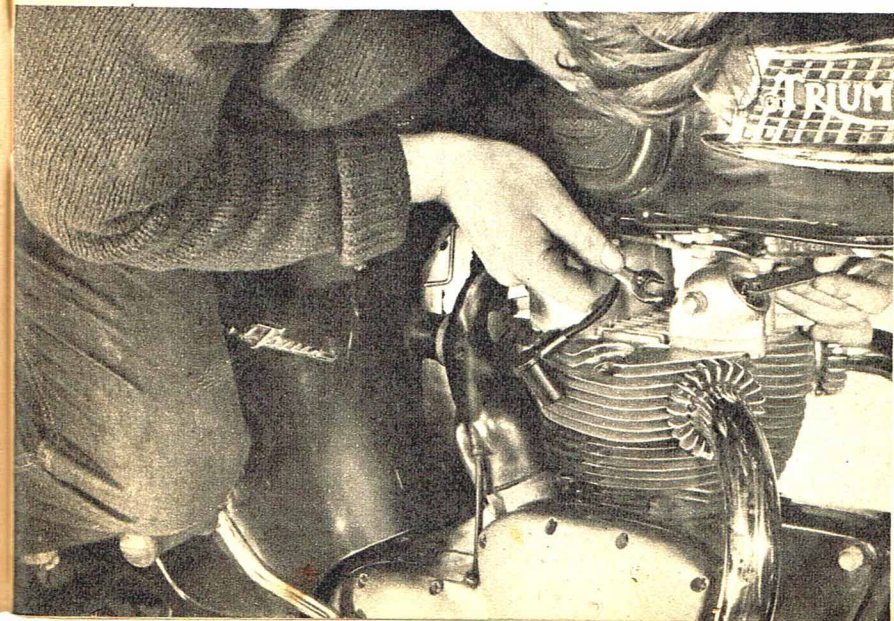
### PLUG READING

In these days of additive fuels, it is not easy to tell from inspection of the sparking plug whether or not the carburettor mixture is rich or weak and the plug is running too cool or too hot. In pre-war years it could generally be assumed that if a plug had a sooty appearance, like that on the right in the picture, the mixture was rich; a whitish (left) appearance indicated an over-weak mixture. The aim was to ensure the plug was a dark, ebony colour (middle) which indicated that it was running at the correct temperature. Today's fuels are loaded with additives which have an effect—though not a serious one—on plug appearance. The descrip-

tion given to a plug operating at the correct temperature applies where a normal leaded petrol with no special additives is employed. Where a fuel containing an "oily" additive is regularly used, the tendency is towards a darker, cooler-running look. Conversely the non-oily petrol additives tend to form somewhat light-coloured deposits.

### BETTER FEEL

When checking valve clearances most enthusiasts turn the engine over to feel first compression by means of the kick-starter. If a knee, or a hand, rather than a foot, is employed on the kick-starter greater sensitivity is achieved.



### ROADSIDE INSPECTION

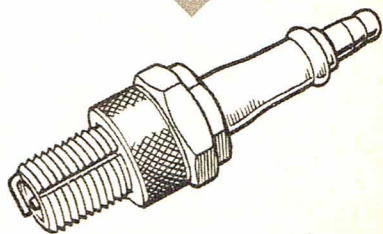
The bulb from a speedometer makes a useful emergency inspection lamp should you be caught out at night. The scheme is first to cut the lead a few inches below the bulb and insert a push-in, rubber-covered connector of the type fitted as standard in motor-cycle and car electrical equipment. A length of wire is then made up for carrying in the tool kit with a terminal from a push-in connector at each end. When the need arises take out the bulb with its holder from the speedometer head and interpose in the lead the length of spare wire.

### LAST DROP OF FUEL

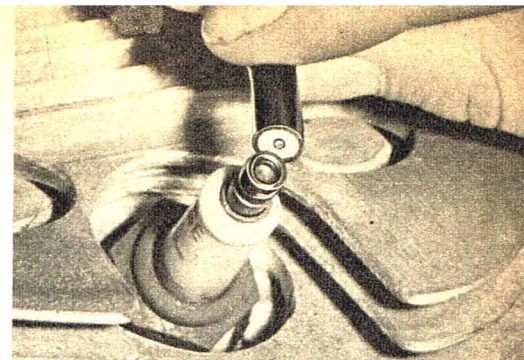
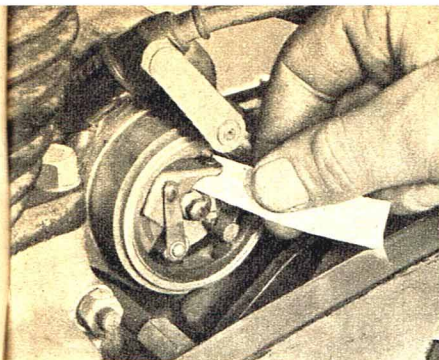
It is unusual for fuel tanks to be completely empty even when you "run out of fuel." The last quarter of a pint or so is likely to be trapped below the level of the fuel tap boss. A scheme, therefore, that will often get you to a filling station is to run the front wheel up a grass bank or even, sometimes, up on the kerb, to drain the dregs into the carburettor. You will probably have to repeat the chore three or four times before the tank is absolutely empty.

### PLUG BOSS CLEANING

It sometimes occurs that when a short-reach plug has been used in place of one of long-reach type, the lower threads in the cylinder-head boss become coated with carbon. The build-up may be so bad as to prevent a long-reach plug being refitted. However, when the head is removed the threads can be cleaned up if a scrap long-reach plug is obtained



and four longitudinal grooves cut in the thread, at 90 degrees to one another, by means of a hacksaw blade. The thread thus becomes a die and by screwing it home, turning it alternately clockwise and anti-clockwise, the cleaning up process can be safely completed.



### IGNITION TIMING

The exact instant at which the contact-breaker points are about to break is not easily determined with machines on which the contact-breaker or distributor is partly shrouded by another component. Slipped between the points when the engine is being slowly turned by the kick-starter, a cigarette paper, which is only 0.0015in thick, gives accurate enough indication of the instant of points opening.

### FITTING VALVE SPRINGS

Replacing valve springs is simplified if a wood block is fashioned so that it fits snugly inside the combustion chamber to support the valve heads.

### CASH EN ROUTE

To be warm, riding gear must be carefully arranged before the start of a run. So keep cash for fuel stops handy in an outside pocket.

### LEAKY TYRE VALVE

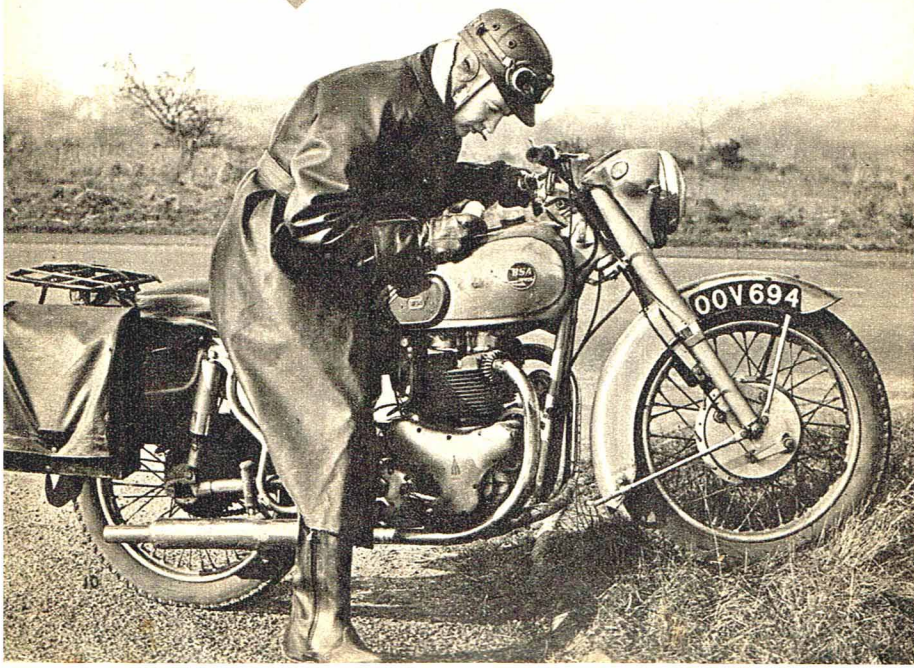
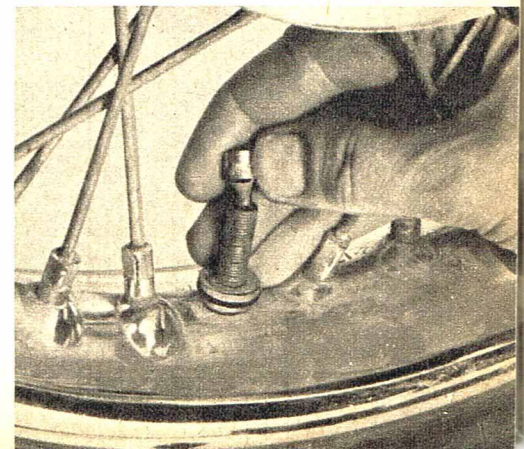
Most of us have had the experience of feeling a pump being forced upward when a tyre is being topped up. The usual cause is a speck of grit and it can generally be dislodged by waggling the valve core with a match or with the little slotted spanner formed on the end of the valve cap. Of course, provided valve caps are always employed, and the business end of the pump connector is kept clean, grit can be kept out of the valve altogether. Old hands give the pump a few quick strokes to clear the connector before attaching it.

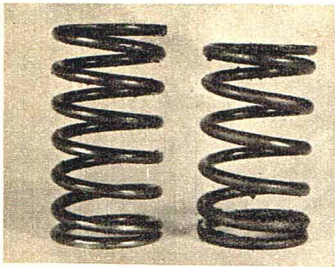
### DE-OILING A PLUG

Should the sparking plug of a single-cylinder engine oil up—become so thickly coated with oil that there is no spark between the electrodes—the only course is to take it out and clean it. With a twin- or four-cylinder engine a simpler remedy is worth trying. While the engine is running on the other cylinder (or cylinders) the high-tension lead of the offending plug is held  $\frac{1}{8}$  to  $\frac{1}{16}$ in from the plug terminal. After a few seconds the plug is likely to start functioning again. It is as well to remember that the fingers should be kept away from the end of the high-tension lead and that a wet cable can administer quite a powerful kick.

### NOISY GEARS

Some car back axles are lubricated by what are known as extreme-pressure oils. Two or three grease-gun fillings added to the gear-box lubricant will often serve to reduce noisy operation in the indirect gears.





### VALVE SPRINGS FINISHED?

The most common method of checking a valve spring is to compare its free length with that of a new spring and scrap the old one if it is shorter by more than one-eighth. But a test of free length is not an infallible guide. A spring may lose much of its temper, for example, while losing very little as regards free length. A better scheme is to take an old spring and a new one, place them end to end, compress them in a vice approximately as far as they would be compressed in service and measure their compressed lengths. That will give a true indication of the suspect spring's worth under operating conditions.

### LUBRICATING CHAINS

Where no method of lubricating a rear chain is provided, the chain should be removed from time to time and washed thoroughly in paraffin. When the paraffin has been drained off, the chain should be immersed in

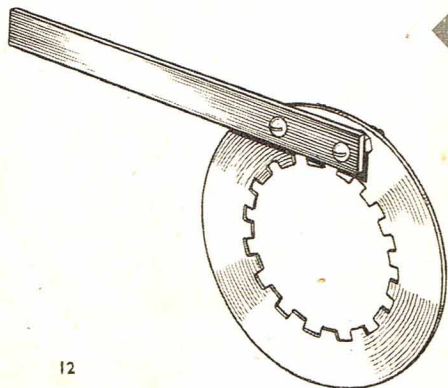
a lubricant such as tallow or grease which has been heated until it is liquid. Leave the chain immersed for about ten minutes, meanwhile moving it about with a stick to ensure that the lubricant reaches the bearing surfaces. Let the grease cool, then lift out the chain and wipe away the surplus. When purchasing a chain lubricant, the purpose for which it is required should be stated since not all greases can be heated without deterioration.

### SECURITY BOLT

In order to prevent the rear tyre from creeping, many rear wheels nowadays are fitted with security bolts. During tyre refitting the bolt is pushed inward when the section of tyre adjacent to it is being pushed home. If it is found that the bolt cannot be moved freely after the tyre is fitted, it is likely that the pad has been trapped under the edge of the tyre. To free the pad it is necessary only to lever the tyre clear of it.

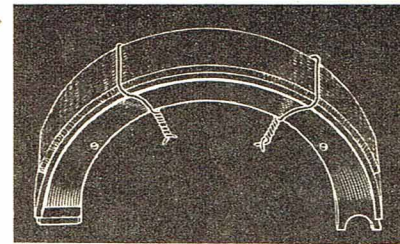
### TIGHTENING THE CLUTCH

A problem when tightening up the clutch retaining nut is how to prevent the clutch centre unit from turning. A dodge used by factory service departments is to employ an old clutch plate—a driven plate—attached to which is a lever fashioned from  $\frac{3}{4} \times \frac{1}{8}$  in mild-steel strip. Of course, if the gear box is installed in the frame and the rear chain and rear brake are connected, the centre unit can be prevented from turning by engaging bottom gear and applying the brake.



### HOLDING BRAKE LININGS

When new brake linings are being fitted a problem is how to drill the holes for the rivets so that they line up precisely with the holes in the shoes. When U-shape bench clamps are not available the linings can be wired to the shoes in the manner illustrated. The drill is then inserted from the inside of the shoe and the wires taken away when the rivets are in position.

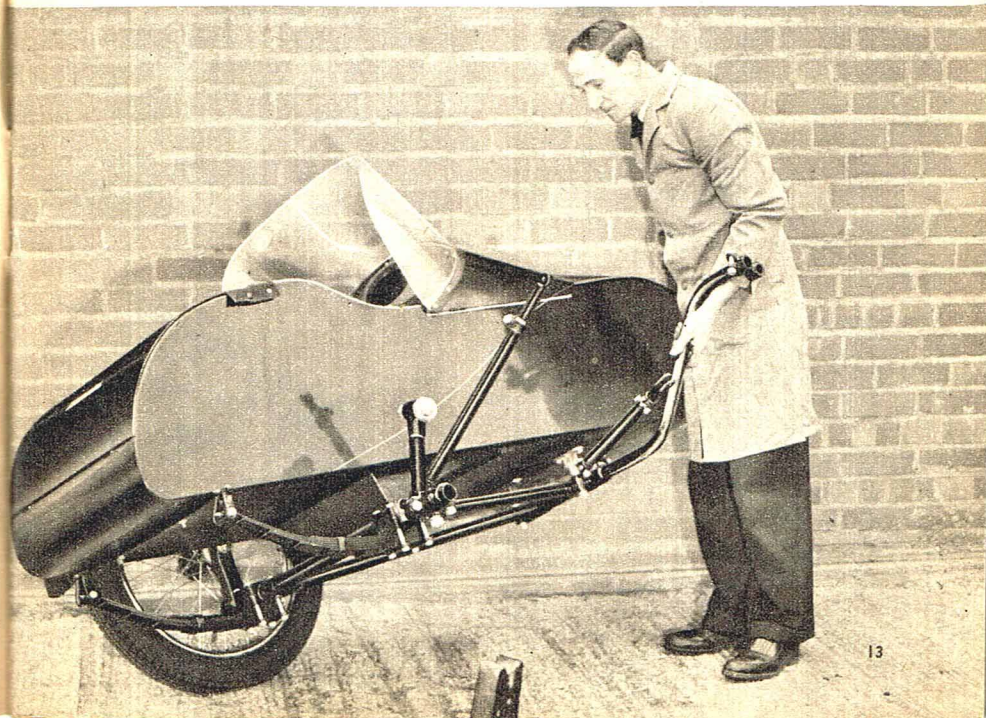


### RIDING THE PLANK

Many enthusiasts' sheds are located at the end of a path preceded, perhaps, by three or four steps. How are the steps surmounted? One way is to use a plank of seasoned  $1\frac{1}{2} \times 12$  in timber with the ends chamfered so that (a) the machine can be wheeled on to it easily at the bottom and (b) the maximum amount of ground clearance remains available at the top. The machine can be walked up with the engine running, bottom gear engaged and the clutch slipping.

### WHEELING A SIDECAR

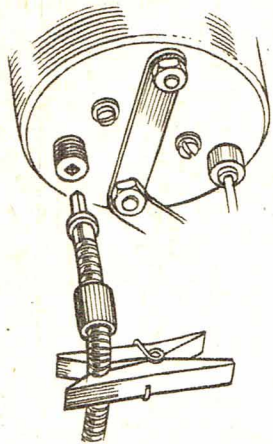
The easiest method of wheeling a sidecar single-handed when it is detached from the machine is to grasp the swan-neck and ball-joint connections. A drawback with the scheme, however, arises when the sidecar comes to be married up to the machine: the "wheeler" is in the way. The solution, then, for the final manoeuvre, is to stand in front of the sidecar, grasp the swan neck with the left hand, push firmly down on the sidecar nose with the right hand and wheel the sidecar backward.





### DRYING OVERBOOTS

Waders or overboots that become damp inside, either as a result of leaks or condensation, can be dried out quickly if they are stuffed with newspaper.



### FERRULE SUPPORT

When connecting the speedometer drive to the head the ferrule tends to slip down the outer cover where it may be difficult to reach. To prevent that happening a clothes peg can be clipped conveniently below the ferrule in the manner shown. When there is no room for a clothes peg (say, inside a nacelle) an alternative scheme is to loop a piece of suitably thick string to the outer casing.

### BEWARE TREES

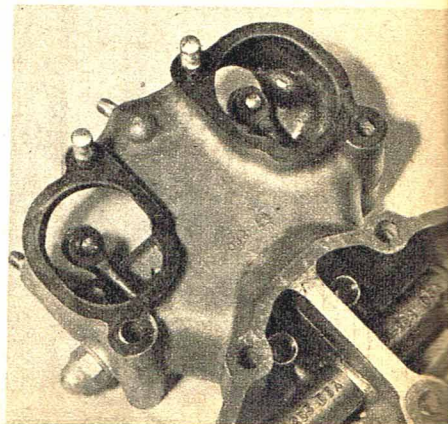
Did you know that damp surfaces under trees should always be regarded with suspicion? Wet leaves on the road are an obvious sign that care is necessary; even in summer, moisture dripping from trees—from leaves and blossoms—can make the road surface slippery.

### OUT OF CIRCUIT

Contrary to popular belief, a machine equipped with a Lucas A.C. generator can be used without the headlamp or battery in circuit. The ignition switch should be turned to the "Emg" position and the cable normally connected to the negative terminal of the battery must be earthed to the frame. The engine should never be run with the negative lead disconnected.

### JOINTING COMPOUND

Generally there is no need to use jointing compound on cylinder to crankcase, cylinder to cylinder head, and carburettor to cylinder joints. Gaskets (where employed) are usually of the right material and thickness to ensure a gas- or oil-tight seal. Where compound can be useful is where paper washers are employed—at the rocker-box, timing case and primary chaincase joints. The scheme then is to use the compound on one side of the washer only so that when the joint is next broken the washer will remain in one piece—stuck fast to one of the two surfaces.



### FINDING A PUNCTURE

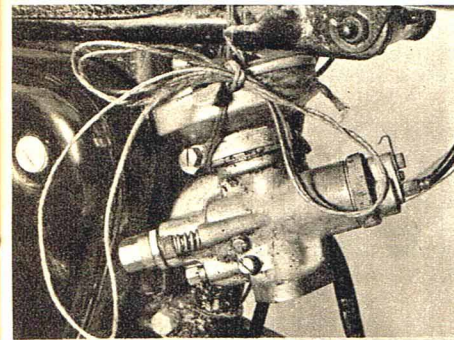
Locating a leak in an inner tube when there is no water available is a simple matter. Inflate the tube and, holding it close to your lips gradually turn it round. When the puncture is opposite your mouth the jet of air will be felt.

### SCOOTER SPLIT RIMS

Scooter wheels may be of split-rim type, in which case the stud threads and the inner faces of the nuts should be greased each time the rim is divided. It ensures that the threads and mating surfaces will not be rusted—and perhaps immovable—when the wheel is next dismantled.

### DURING A DECOKE

There is no need to take the carburettor right off the machine when a cylinder head (or cylinder in the case of a two-stroke) is being removed.



It can generally be tucked out of the way (and be far more out of harm's way than if it were on the bench) if it is tied to a frame tube.

### LOOSE GRIPS

If a handlebar grip is loose the end of the handlebar (or the twistgrip) should be bound evenly with insulating tape. The grip can then be pushed on after it has been damped with petrol—or "lubricated" internally with rubber solution.

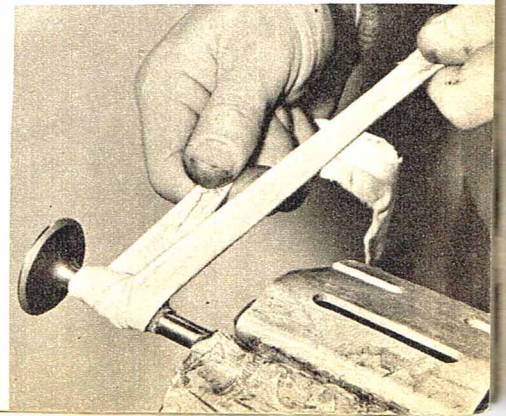


### AFTER A SHOWER

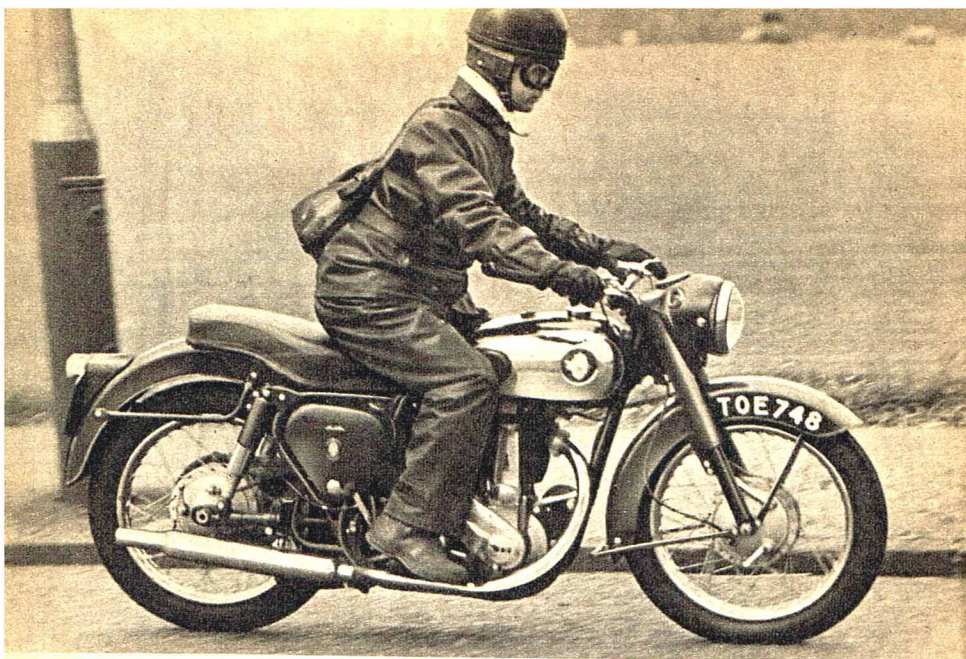
In winter, roads in towns and cities are generally washed clean by frequent rain. In summer, however, remember that dust, rubber particles and oil can form a film which will be very slippery just after a shower.

### DIABOLO POLISHING

One of the experts' techniques for polishing a spindle or valve stem is by the so-called diablo method. The job is mounted in a vice between soft clams so that its surface will not be marked by the teeth on the jaws. A strip of emery cloth is then wound twice round the shaft and over-wrapped three or four times with a 2ft or 3ft length of cotton tape. The ends of the tape are then pulled alternately so that the emery is spun round the spindle. In this way a really first-class finish can be imparted along the whole length of the article.







### HOW TO STOP

There is no question about which brake is the more effective and safer to use. It is, of course, the front brake. When a machine's speed is reduced much of the weight is transferred to the front tyre. In other words, the centre of gravity of the machine is moved forward and the proportion of the weight on the rear tyre is reduced. The result is that under heavy braking there is a marked tendency for the rear wheel to lock and so cause a skid. In the case of the front tyre the braking effect forces it into improved contact with the road so that, so long as it is travelling on a straight path, it is most unlikely to skid.

### PILOT AIR SCREW

On some older machines the pilot air screw and throttle stop screw are difficult to reach owing to the proximity of, say, the dynamo. In that case the screws should be withdrawn and a  $\frac{1}{2}$ in length of hard wire soldered, tommy bar fashion, into the

screwdriver slot in each screw head. Adjustment can then be effected by pushing one of the tommy-bar arms with a screwdriver.

### ACCIDENT POINTERS

Should you be involved in an accident, fuss and bother later can be avoided if you attend to the following points. Note the registration number of any passing vehicle whose driver might have seen the incident (the owner can be traced by the police through the licensing authorities). Take the names and addresses of any witnesses and, if you have a camera, photograph the vehicles before they are moved. Do not discuss the affair with passers-by or with others involved. Do not make an apology or admit liability. Report the matter to your insurance company as soon as possible.

### TWILIGHT RIDING

Experts maintain that more care is required at twilight than at any other time in the 24 hours. The half-light

is extremely deceptive and unlit bicycles, pedestrians wearing dun-coloured clothing and straying animals may not be easily seen. The dip beam, rather than the pilot bulb, should be used in such circumstances for then there is little likelihood of one's machine not being noticed; and the light from the dip beam is sufficient to reveal the lie of the land.

### TYRE PRESSURES

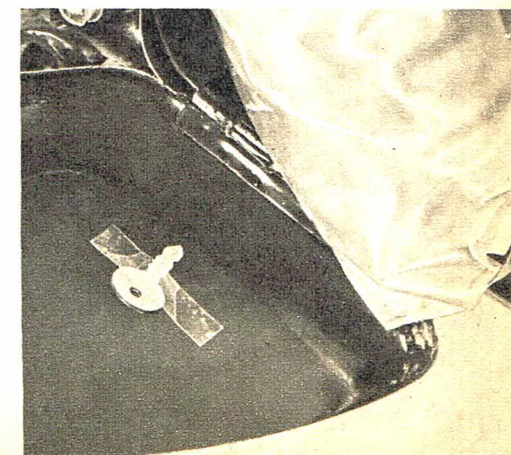
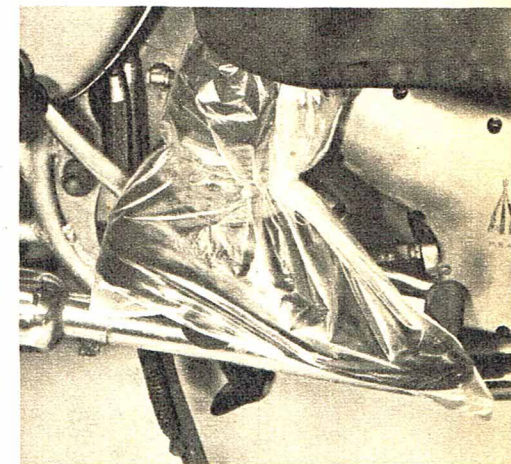
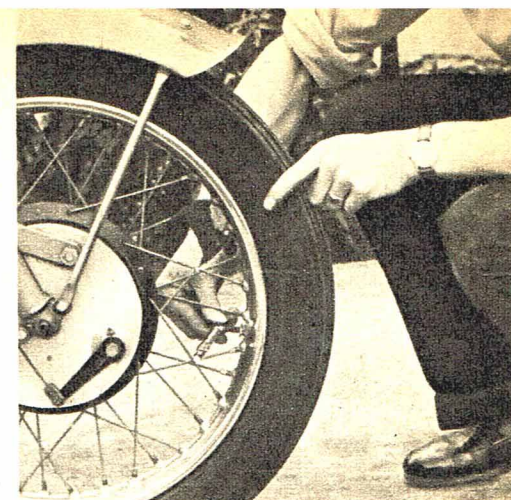
Manufacturers' recommendations on tyre pressures should always be maintained if long tyre life is to be ensured. Tyres run at too-low pressure suffer from uneven, heel-and-toe wear and those run at excessively high pressure develop a "flat" tread—the middle of the tread pattern wears more quickly than the side buttresses. With natural-rubber tubes the pressures should be checked weekly; when the tubes are of synthetic rubber (which is non-porous) a check need be made only at monthly intervals; and the same ruling holds good for the tubeless tyres fitted to some makes of scooter.

### NO OVERBOOTS?

The capriciousness of British weather combined with natural human optimism results in the best of us being caught out in a shower on a short journey—at some time or another—without overboots. What a member of *The Motor Cycle* staff does is to carry two large-size polythene bags and two elastic bands in the pocket of his riding coat. Then, when a shower is encountered, the plastic bags are slipped over his shoes and secured at the ankles by the elastic bands.

### SPARE KEY

In these days of coil ignition, have you ever mislaid your ignition key? The inside of a tool-box lid is but one place where the spare can be securely taped. A member of *The Motor Cycle* staff carries his second key in his zipped tobacco pouch.





### CUTTING GASKETS

Did you realize that the cover pages of *The Motor Cycle* make excellent gasket material for use between crankcase halves, between cylinder base and crankcase or for timing-case cover joints? One way of cutting such a gasket is to brush a thin layer of jointing compound on a joint face and allow it to become tacky. The paper sheet is then applied and cut by rubbing round the edges of the joint face with a very light hammer. The necessary holes are made by placing a bolt or ball bearing over the hole and tapping it gently. The ball should, obviously, be of larger diameter than the hole.

### AIR FILTERS

With petrol so expensive, many riders have sought an alternative means of washing out gauze-type air filters. Hot water containing household detergent will do the job equally well. Incidentally, with petroleum-lubricated two-strokes there is no need to oil the element again since blowback does that automatically.

### BETTER TAPE

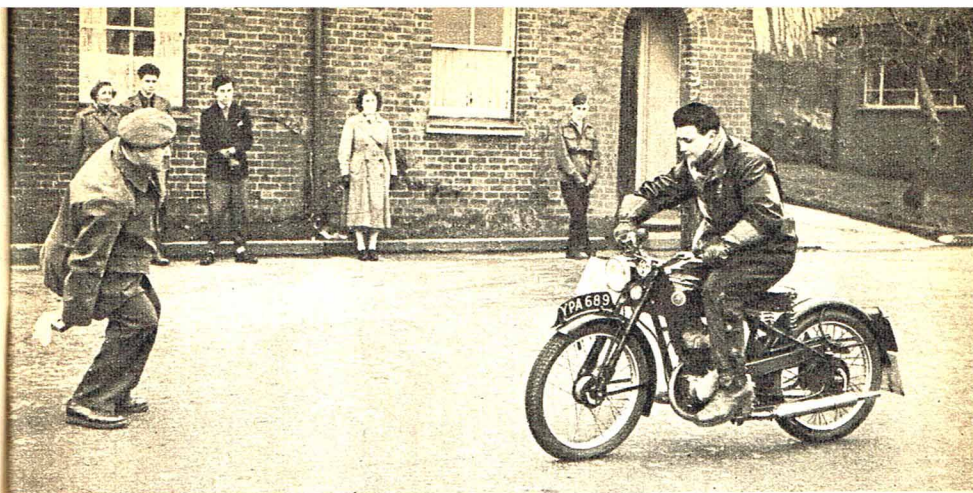
Over the years, ordinary electricians' insulating tape has served motor-cycle enthusiasts faithfully and well. Nowadays there is an alternative—plastic tape which is slightly elastic and so remains more tightly bound. It is waterproof and oilproof.

### SAFETY-HELMET CHOOSING

A perfectly fitting helmet must be neither too loose nor too tight; it must feel absolutely comfortable. When the helmet is worn, the strap should take a natural line under the chin; if the strap lies too far forward or too far back, discomfort and draughts are inevitable. A flexible peak, remember, can do more than keep rain off your goggles and the sun out of your eyes; it can protect your eyes in the event of a spill. Inspect the peak carefully, for some are too short and too high to be of real practical value.

### METAL STRETCH

It may not be generally realized that all steel "creeps" or stretches when it is first placed under load. The phenomenon is due to molecular realignment and that is the reason why it is a wise precaution to check the tightness of all nuts and bolts in the early part of a machine's life. The bolts settle down after two or three months, after which the use of self-locking nuts will retain the tightness indefinitely.

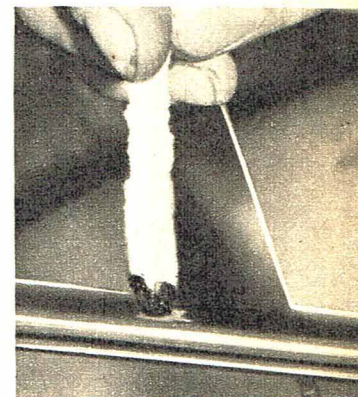


### LEARNING TO RIDE

If you are a newcomer—or a youngster still without your first machine—you may not be aware that motor-cycle clubs up and down the country are running what is known as the R.A.C.-A.C.U. Training Scheme. Instructors are experienced clubmen—the best riders on the road. Lessons cover riding, roadcraft, engine theory and maintenance and overhaul, and at the end of a season trainees take a proficiency test. Courses consist of 24 lessons and the price is in the region of 36s. Machines are provided by the club or training organization responsible for the course. If you want to know the name and address of the organizer responsible for training in your area, drop a line to the Technical Information Editor, *The Motor Cycle*, Dorset House, Stamford Street, London, S.E.1.

### TOUCHING UP

Minor scratches and chips in enamel are not easily touched up by means of an ordinary-type paint brush. For easier application of enamel use either a brush from Junior's paint box or, better still, a pipe cleaner. On the same theme is a second dodge to prevent the spread of corrosion during the period between a chip occurring and the necessary time becoming available in which to touch it up. A smear of transparent nail varnish or chrome protector on the virgin metal will do all that is necessary until the job can be tackled properly.



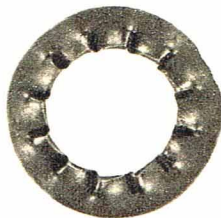
### RUSTY TANK

When the interior of fuel tank becomes rusty, flakes of rust tend to clog the tap and filter and particles may even reach the carburettor. In order to get rid of the corrosion, remove the tank and drain it completely. Pour in approximately a quart of rust-removing fluid (available at most accessory stockists) and drop in also a few pebbles (or steel nuts). Then replace the filler cap and shake the tank vigorously until all the flakes have been dislodged. The tank is then washed out with water and the pebbles removed. Care is necessary to ensure that the tank is thoroughly dry inside before petrol is again poured in. Remember that the chemical action of some fluids

liberates highly inflammable gas, so the tank should be kept well away from any naked flame—and from burning cigarettes.

### LOCKING WASHERS

Where self-locking nuts are not employed there is very often a locking washer with a serrated edge—a



washer that clings to the nut and to the surface on the other side with a saw-tooth type of action. When it comes to undoing the nut and removing the bolt, do you remember that, assuming the bolt head is accessible, it may be easier and more satisfactory to turn that end than to disturb the nut?

### RIDING AT NIGHT

Whenever possible only goggles with glass lenses should be worn on night rides. Plastic lenses have the disadvantage that they become scratched in time and the scratches cause lights to produce a disconcerting "starring" effect, which becomes especially pronounced in rain.

### BRAKE ADJUSTMENT

To provide extra brake adjustment on some models a distance tube can be fitted on the operating rod—between the cam lever and the adjuster.

### GET-YOU-HOME STAMP

Red rear-lamp glass broken? Stick a 2½d stamp on the bulb as a temporary expedient. (A one-time member of *The Motor Cycle* staff once bought a stamp from an inquisitive policeman for this purpose!)

### ACCOMMODATION ABROAD

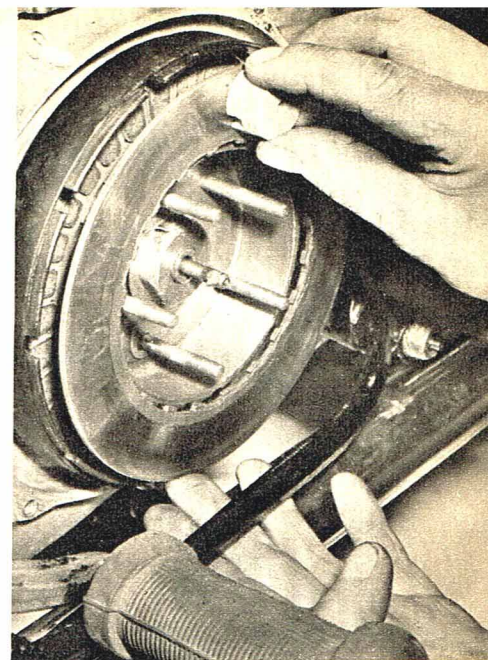
Motor cyclists touring in France cannot go very far wrong if they seek out hotels carrying *Les Routiers* signs. A *routier* is a long-distance lorry driver and halts provided for his comfort are clean and inexpensive. A list of *Les Routiers* houses may be obtained from the French Government Tourist Office on request. The address is 178, Piccadilly, London, W.1.

### GAUNTLET GLOVES

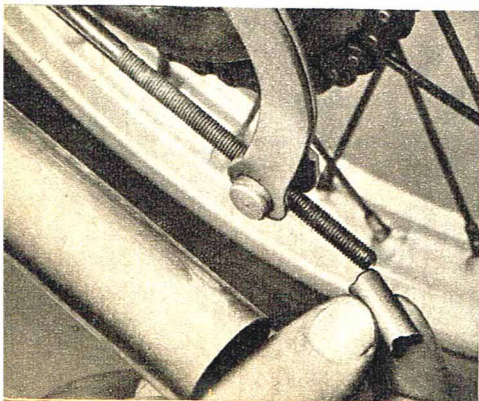
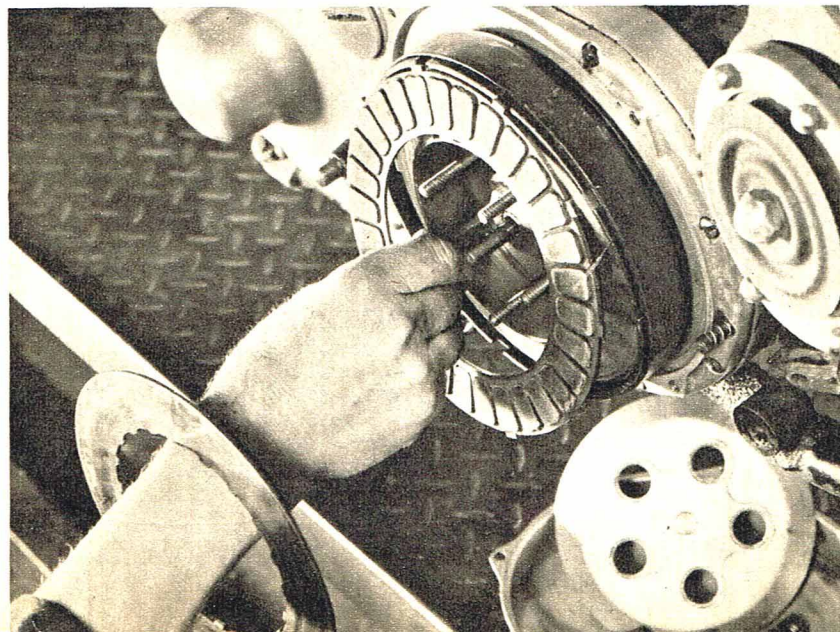
In heavy rain, except where a plastic jacket with guttered sleeves is being worn, water is liable to run down the sleeves and trickle into the gauntlets. Where the gauntlets are unlined and of soft material, they can be tucked inside the riding-jacket sleeves. Another scheme is to make up a pair of simple plastic gaiters with elasticated ends to extend from above the gauntlet to the wrist.

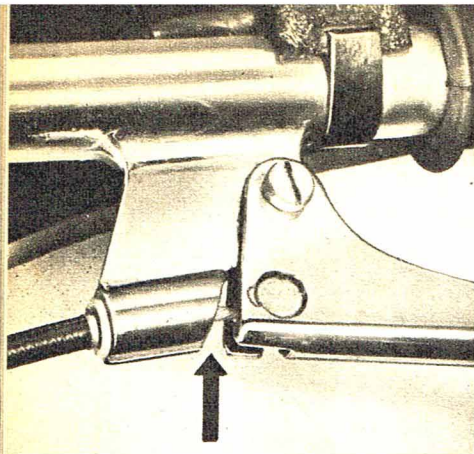
### RELUCTANT PLATES

Clutch plates that tend to stick when the clutch is being dismantled can generally be eased out with the aid



of a magnet. Another way is to lean the machine over towards the clutch side, grasp one of the clutch screws between forefinger and thumb and rotate the assembly. The plates will fall out over your hand and settle on your wrist.





### CLUTCH BEDDING DOWN

Keeping an eye on clutch adjustment is particularly important in the first few hundred miles of machine's life. The friction material may bed down rapidly, and so take up all the slack in the cable. If this point is neglected the clutch may slip and cause rapid wear of the plates; the thrust mechanism will be overloaded also. Regular inspection should be made to ensure that there is always  $\frac{1}{8}$  in free play at the handlebar lever.

### ELECTROLYTE LEVEL

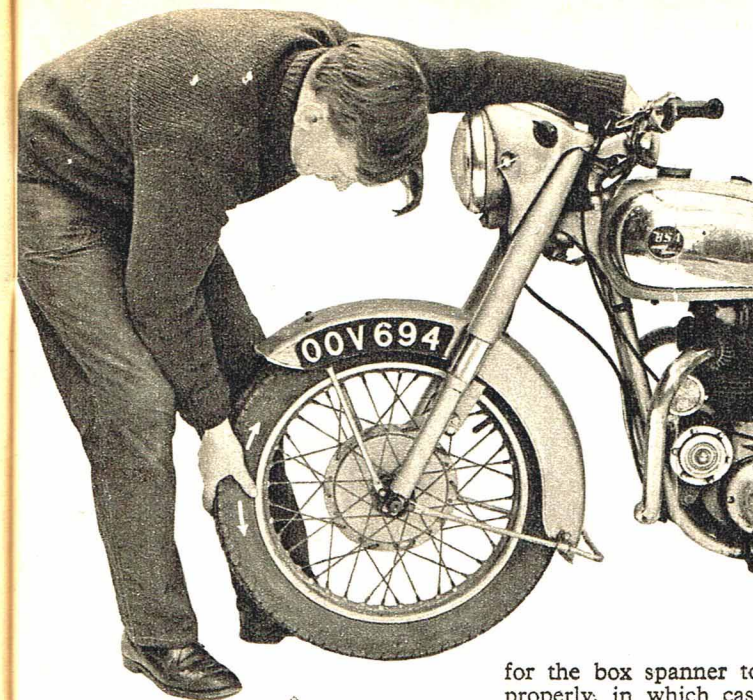
The time-honoured ruling in regard to batteries was that the electrolyte level was correct when it was approximately  $\frac{1}{8}$  in above the separators; nowadays the recommendation is that it should come no higher than the tops of the separators. It is particularly important in these days of batteries charged from A.C. generators and through rectifiers that overfilling is avoided if "boiling" (with consequent damage inside battery boxes, and occasionally to silencers) is not to occur.

### GILDING THE LILY

Sparking plugs of non-detachable type can be properly cleaned only by sandblasting—a job carried out by most garages in a few minutes for a few coppers. But with some types of plug even sandblasting does not make a perfect job, for the sand cannot reach between the side electrode and the tip of the centre electrode. A sound move, then, is to run a nail file or a strip of emery cloth between the points to complete the job.

### AVOIDING HEAD DISTORTION

When a cylinder head is being removed the bolts or nuts should be slacked off a flat at a time, and one should work diagonally across the head; by this means tension is taken off the head gradually and uniformly and distortion will be avoided. As soon as all bolts (or nuts) are free they can be unscrewed indiscriminately.



### STEERING-HEAD PLAY

Wear, or slackness of the steering-head bearings, can be checked by raising the machine on to its stand and placing the tips of the fingers of the left hand at the rear of the gap between the top fork yoke and the steering head of the frame. The right hand is then used to rock the front wheel backwards and forwards. Movement felt by the fingers indicates that the bearing is too loose. True adjustment is achieved when there is no perceptible play at the bearing and when the steering can be turned from lock to lock without stiffness while the front wheel is clear of the ground. If roughness is apparent the odds are that the bearings are pitted and therefore ready for renewal.

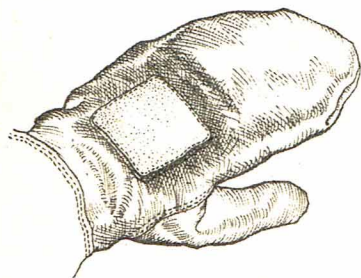
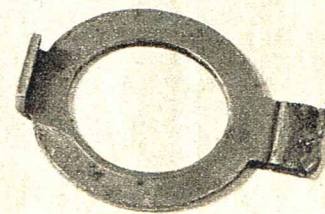
### AWKWARD NUT

A nut to be fitted to a bolt where there is not enough room for a hand can often be started if it is first placed in the end of a box spanner. However, there may not be sufficient room

for the box spanner to be lined up properly, in which case a length of rod (or an old bolt) slightly larger in diameter than the threaded bore of the nut should be used after a taper has been filed on one end. The nut then becomes a friction-held fit on the taper which compensates for malalignment between rod and bolt.

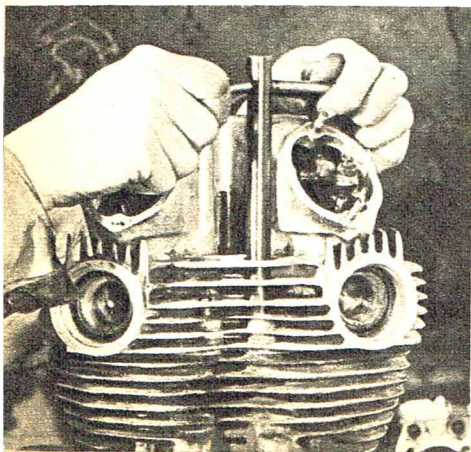
### TAB WASHERS

A tab washer should be used only once. When it has been removed the tab usually cracks (if it does not fracture completely). Hence before any job involving the removal of such a washer is undertaken, a spare should be on hand ready for fitting.



### WIPING GOGGLES

This is a dodge known and used by all racing men. For wiping their goggles effectively (and quickly!) in rain they sew a piece of chamois leather to the thumb or first finger of one of their riding gloves. Alternatively the patch can be on the back of a glove and can be made slightly bulbous and, therefore, more effective if it is sewn over a small piece of sponge-rubber sheeting.



★ **Horn Sounding:** It is an offence to sound a horn (or any "warning instrument") in a built-up area between the hours of 11.30 p.m. and 7 a.m. The horn must never be used on a stationary vehicle.

★ **Speedometer Required:** All private motor vehicles (except two- and three-wheelers of 100 c.c. or under), registered for the first time after 30 September 1937, must be equipped with a speed indicator.

★ **Parking at Night:** Except in a one-way street or official parking place, it is an offence to pull up or park on the wrong side of the road at night, i.e., the left side of a stationary vehicle must be adjacent to the edge of the road.

★ **Towing:** A solo motor cycle may tow only another solo and then only if the towed machine is broken down.

★ **One Passenger:** Only one passenger may be carried on a solo and he or she must sit astride, behind the rider, on a proper seat securely fixed to the machine. Suitable footrests for the passenger must also be fitted.

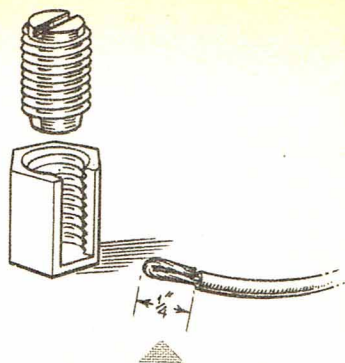
★ **Headlamp Use:** Except in traffic stops the main headlamp bulb must always be switched off when a motor vehicle is stationary at night.

★ **Silencer Requirements:** A motor vehicle must "be fitted with a silencer, expansion chamber or other contrivance suitable and sufficient for reducing as far as may be reasonable the noise caused by the escape of the exhaust gases. . . ."

★ **Trespass:** It is illegal to drive a motor vehicle over land that is not part of the road except to a depth of 15 yards for the purpose of parking and then only if there is no trespass.

★ **On The Beach:** The foreshore—the part of the beach exposed between high and low tides—is the property of the Crown and it is illegal to drive a motor vehicle on it.

★ **Electrical Trouble:** Don't panic should you encounter lighting trouble that cannot be rectified on the spot. A solo may be legally wheeled as near as possible to the left-hand side of the road during darkness without lights.

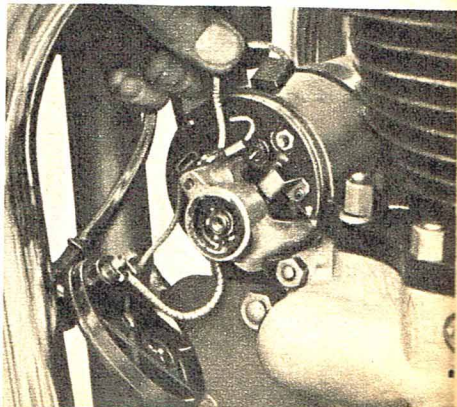


### ELECTRICAL CONNECTIONS

The first rule about making an electrical connection is that no more insulation than necessary should be stripped from the wire. That is important if short circuits are to be avoided by bared wire coming in contact with another wire or nearby component. When a wire is being attached to a blind terminal such as that illustrated, the bared section of wire should be doubled back to provide a bigger surface on which the grub screw can bite. Where the terminal consists of a simple screw or a bolt and nut, a small, spade-type tag should be soldered to the end of the wire; should a tag not be available, the bared end of the wire should be wound once round the male terminal thread—and wound so that the loop will be tightened as the screw or nut is screwed up.

### BRUSH CONTACT FACES

If dynamo brushes are highly polished on their contact faces, all is well. On no account should the polish be removed with emery cloth.



Provided a dynamo has not been overdosed with oil, the contact faces will probably never require attention during the brushes' lifetime.

### BRAKE SQUEAL

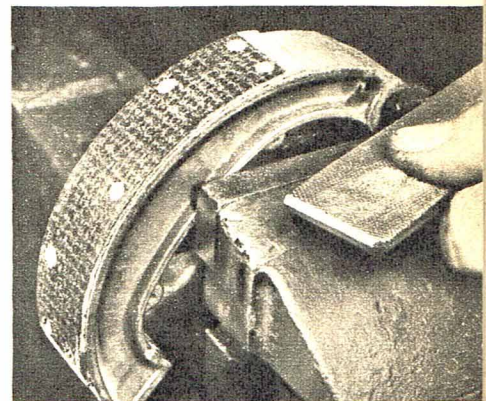
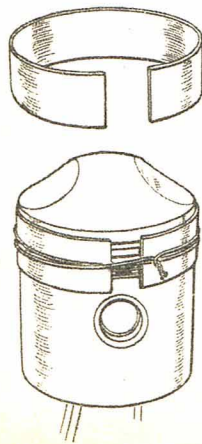
If brakes squeal in operation a cure can often be effected by cleaning both drum and linings with petrol (not petrol) and then rubbing the surfaces with emery. Another phenomenon often experienced with modern brake-lining materials is grabbing when the material is drying out. A partial cure can often be achieved by chamfering the ends with a coarse file.

### REAR-CHAIN ADJUSTMENT

When adjusting the rear chain, how do you know that you are not turning one adjuster more than the other and so upsetting wheel alignment? The answer is to turn each adjusting nut or bolt by one flat at a time and to count the number of flats.

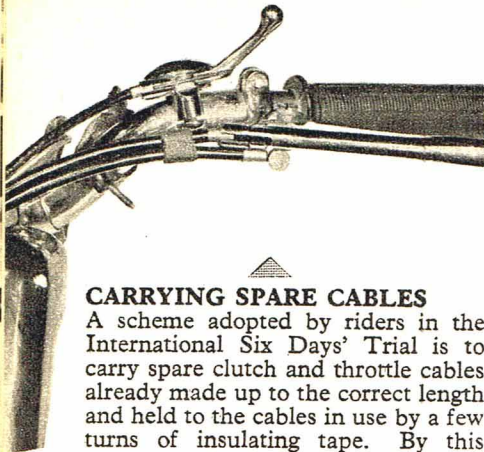
### SIMPLE RING CLAMPS

For securing piston rings while the cylinder is being lowered clamps can be made from light-alloy strips of approximately 16 gauge. The strip should be cut sufficiently wide to cover all three rings (or both rings in the case of a two-stroke) and held in place lightly by a turn or two of copper wire.



### REFLECTOR CLEANING

It is not generally appreciated that modern headlamp reflectors are not chromium plated but coated with a very thin film of aluminium. The film is so thin that it must on no account be treated with metal polish. A reflector in good condition should receive at most, no more than a gentle wipe over with a soft, dry cloth. One in not-so-good order may be brightened by means of calamine lotion applied with a pad of cotton wool. Reflectors of sealed-beam lamp units cannot be separated from the lens so that with them the problem does not arise.



### CARRYING SPARE CABLES

A scheme adopted by riders in the International Six Days' Trial is to carry spare clutch and throttle cables already made up to the correct length and held to the cables in use by a few turns of insulating tape. By this means, should a cable break, the replacement can be fitted in a matter of seconds. The spares should be fitted and the controls operated before they are passed as reliable.

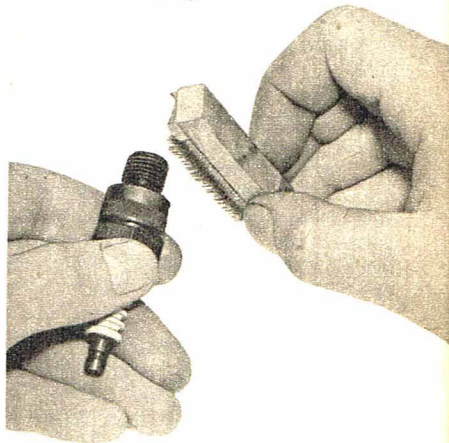
### PETROL ABROAD

Two Western European countries, Italy and Yugoslavia, offer coupons which enable tourists to obtain petrol at reduced tourist rates. (France has a similar scheme in operation but as this booklet closes for press the concession still does not apply to motor cycles or scooters.) In Italy the coupons are issued by the Automobile Club of Italy at provincial offices or, before you leave, you can obtain them from the Swiss Bank Corporation in London. For Yugoslavia get them

at the Yugoslav National Tourist Office, 143, Regent Street, London, W.1.

### PLUG HEAT TRANSFER

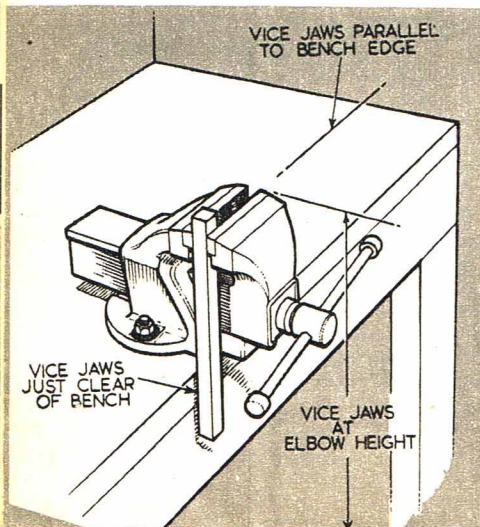
Fouling of the threads of a sparking plug tends to retard the heat flow from the plug to the cylinder head. Hence each time a plug is unscrewed from the engine the threads should be wire-brushed to remove dirt and carbon. When a plug is refitted a new washer should always be used,



thus ensuring not only a perfect gas seal but also a good heat path and keeping the plug in its correct heat range.

### MOUNTING A VICE

For maximum convenience in working a vice should be set up as shown in the accompanying drawing. The jaws should be at elbow level if hack-sawing and precision filing are to produce the desired results, and the fixed jaw should be parallel to the edge of the bench and overlap it slightly so that a long length of metal can hang down in front of the bench when held vertically in the jaws. Finally, for maximum rigidity, the vice should be positioned as near as possible to a bench leg.



### REPLACING A REAR CHAIN

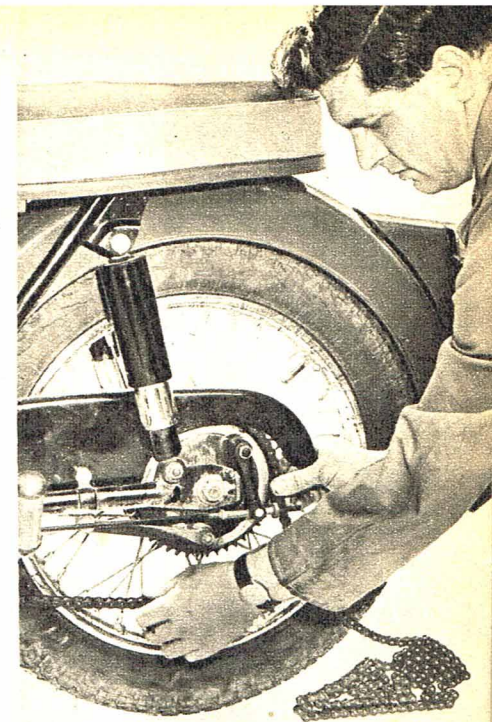
Before removing a rear chain for cleaning and lubricating, always attach a second length of chain to that to be used. By this means the second chain will remain around the gear-box sprocket, ready to pull the cleaned chain into position. In the same way, when a new chain is to be fitted, the old one can be employed to pull it on.

### DRYING SIDECAR HOODS

Wet hoods should be kept buttoned in position until they are dry. If they are rolled or folded wet, shrinking is likely to occur with consequent future difficulty in putting them up.

### LIFTING THE HEAD

When its holding-down bolts (or nuts) have been withdrawn, a cylinder head may be reluctant to part from the barrel. As damage to the joint faces might result, a screwdriver should never be used to prise off the head. A better method is to screw the bolts back in by a few turns and, with the



sparkling plug in position, operate the kick-starter smartly. Compression will in all probability do all that is necessary. If it does not, try jolting the head with the flat of your hand or a stick of wood.

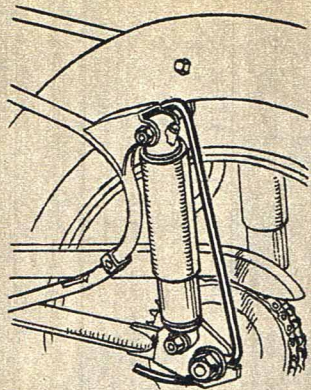
### WATCH FOR REFLECTIONS

Everyone knows the value of looking under parked vehicles to spot the feet of anyone, otherwise concealed, who may be about to cross the road. But do you know the dodge of glancing at shop windows for similar warning? The large reflecting surfaces, particularly those of corner shops, can be full of information.

### FILLER-CAP LEAKAGE

With hinge-type filler caps on oil and petrol tanks a bad seal is nearly always the result of malalignment of the hinge eye on the cap with the lugs on the filler neck. Withdraw the split pin on which the cap is hinged and tighten the cap down fully. Then with pliers set the eye on the cap as necessary until the pin will slip into position freely.





twin-seat and slip the hooks in position. The model can then be placed on the stand and the chain adjusted.

#### PUMP PROTECTION

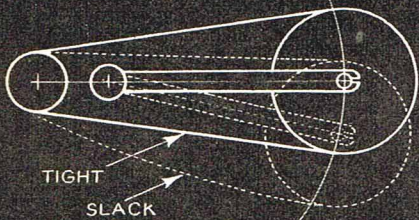
A useful means of ensuring that your tyre pump remains free from road grit can be provided by two lin lengths cut from an old cycle inner tube. One is slipped over the air outlet and the other is used to seal the gap between the handle and the body.

#### SELLING A MACHINE

If you are selling a machine and decide to advertise it in *The Motor Cycle*, the wording of the advertisement should be short yet descriptive. State the make and type of model, its year of manufacture and the price you expect. Give an idea of its condition in a few well-chosen words. Give the address (and telephone number) and if the machine can be seen only at certain times, say so. Should you not want to disclose your address you can use a box number.

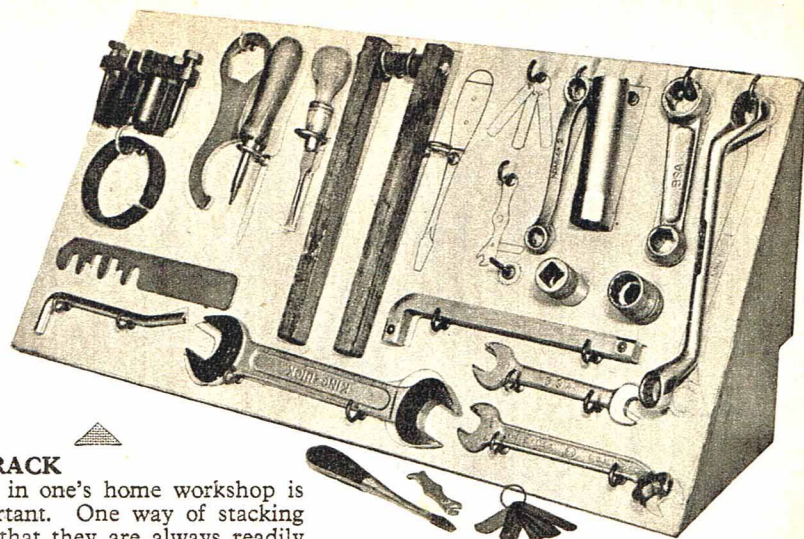
#### WHEN THERE IS FROST

Hoar frost can provide a road surface akin to that of a skid pan. In nine cases out of ten under such conditions, the old hand will ride with his wheels in the gutter. There grit and chippings, swept down the camber by vehicle wheels and rain will generally permit him to get along without slides. (He will often adopt the same technique on ice or a thin layer of snow.)



#### LOADING REAR SPRINGING

On pivoted-rear-fork models rear-chain adjustment is best made with the equivalent of normal load on the rear suspension. If adjustment is carried out with the machine unladen the chain may be too tight over its working range—with possible damage to the gear-box bearings. To obtain the required spring loadings a pair of hooks can be made up from  $\frac{1}{8}$  or  $\frac{3}{16}$ -in-diameter rod as shown in the illustration. The scheme is to loosen the wheel nuts, ease the machine off the stand, apply one's weight to the

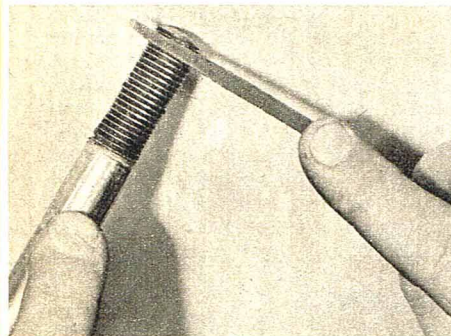


#### TOOL RACK

Tidiness in one's home workshop is all important. One way of stacking tools so that they are always readily to hand is shown in the illustration. Tool outlines are traced when the tools are in position and then the pencil marks are painted over with a child's paintbrush.

#### DAMAGED THREAD

A thread that has become partly burred—damaged as a result of being



forced through, say, holes in steel pressings slightly out of register—can be cleaned up by careful use of a small three-corner file.

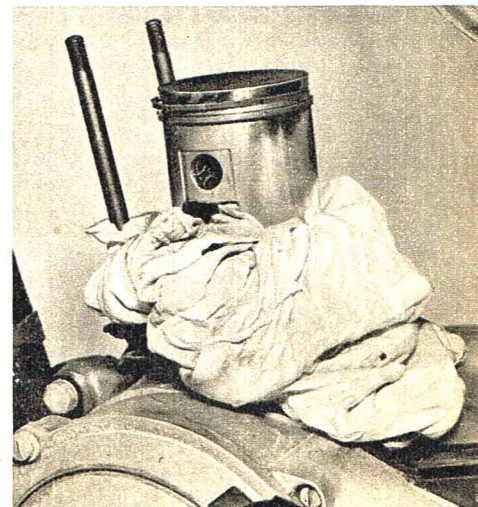
#### PREMIUM—OR SOME OF EACH?

Many riders of medium-performance roadsters use premium-grade fuels although their engines do not in fact require a high-octane diet. Over the

course of a year a substantial saving can be achieved from the use of one of the medium-price mixtures or by taking on a 50-50 mixture of premium and standard grades. The majority of lightweight two-stroke models, indeed, will run on neat standard fuel without pinking.

#### SEALING THE CRANKCASE

As a cylinder is raised during an overhaul the crankcase mouth should be stuffed with a piece of clean rag. Then, should a piston ring be broken, the pieces will be prevented from falling into the crankcase.





### WINTER WARMTH

One of the coldest (yet most enjoyable) tasks that annually faces members of *The Motor Cycle* staff is reporting the M.C.C.'s great long-distance night trial—the "Exeter." Frequently-worn garb for the trip includes football stockings, slippers and pyjama trousers all worn under waders or overtrousers. Two or three pullovers are often employed, for it is separate layers trapping pockets of warm air that provide most warmth. The same applies to gloves: silk inners worn under loosely fitting mitts can be a boon. Looseness of fit is most important, for tightness in

any garment restricts blood circulation. By the way, many "Exeter" competitors slip a newspaper inside their riding-suit jackets—breastplate fashion—for newspaper forms an excellent windbreak. They may, too, wind a long scarf round the lower parts of the body, Norwegian style.

### DRY CARBURETTOR

When water running down the tank drains on to the carburettor top it can enter by way of the throttle and air cables and so prove troublesome. A cure is to obtain a 6in or longer length of bicycle inner tube, pass the cables through it and place it so that its lower end comes down over the carburettor top ring.

### BUYING A MACHINE

When estimating how much can be spent on buying a machine, new riders should remember to budget for purchasing good riding gear in addition to the cost of insurance, vehicle licence and driving licence.

### ENGINE BEARINGS

A low-pitched grumble which eases with a reduction in throttle opening or load is indicative of worn main bearings. A thump or deep tap which eases similarly suggests big-end wear. Neither should be confused with piston slap, a metallic clatter more noticeable when the engine is cold than warm, or valve-gear noise which, of course, does not vary according to the load on the engine.

### INSURANCE

The normal motor-cycle insurance policy covers the holder alone in the use of his machine and when riding someone else's provided his own is not in use. When another machine is being ridden it is usual for the indemnification to be restricted to the minimum third-party cover required by law, that is, bodily injury to or the death of another person. These points should always be borne in mind when you are sampling on

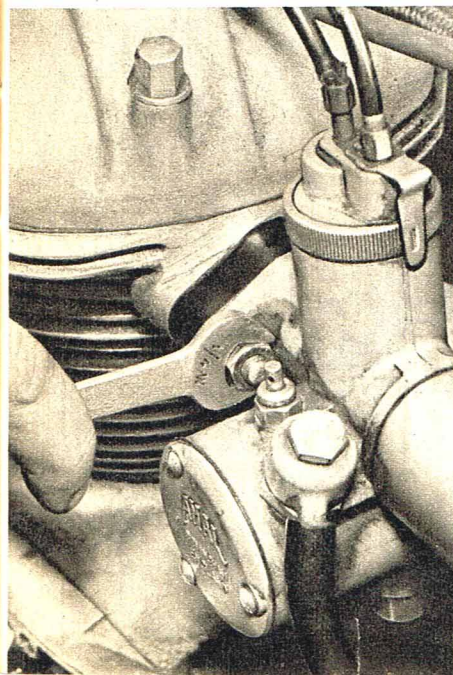
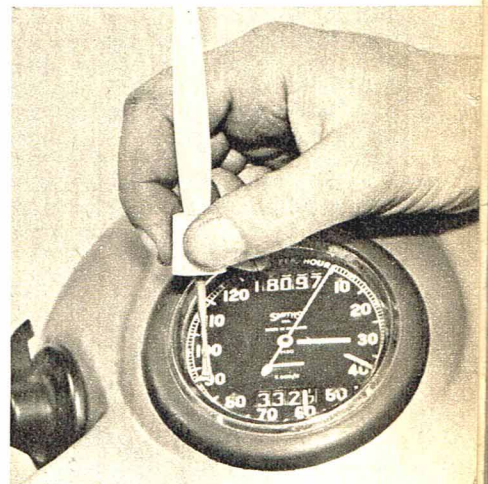
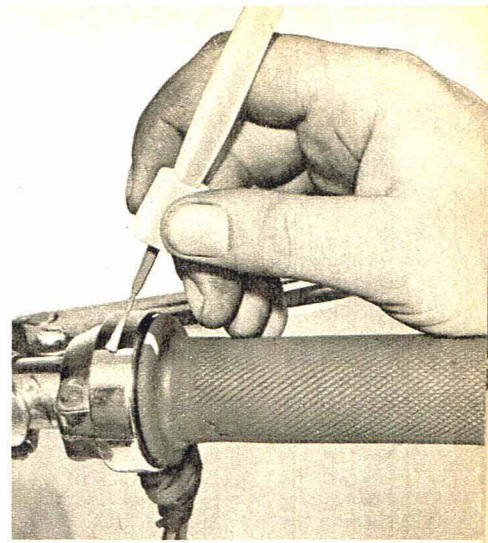
the road a machine you may be thinking of buying—or when a prospective purchaser is trying your machine. Remember, too, that insurance protection is invalidated if the rider has not held a driving licence or is disqualified from obtaining one. Although you may not be guilty of breaking the law you can be involved in proceedings for aiding and abetting.

### NAIL-VARNISH USES

Applications for nail varnish—of the coloured variety—are fairly numerous. For example, have you thought of it as a means of marking the twist-grip to show just how far the throttle is open during running-in? For indicating the best cold-starting position? For marking the speedometer glass to show the maximum permissible speeds in the indirect gears?

### BACKFIRING

Banging in the silencer when the throttle is closed or nearly closed is not always the result of a partly choked pilot jet or weak pilot setting.



As often as not it is caused by an air leak in the exhaust system—where the exhaust pipe is attached to the cylinder or head or at the joint between the pipe and silencer.

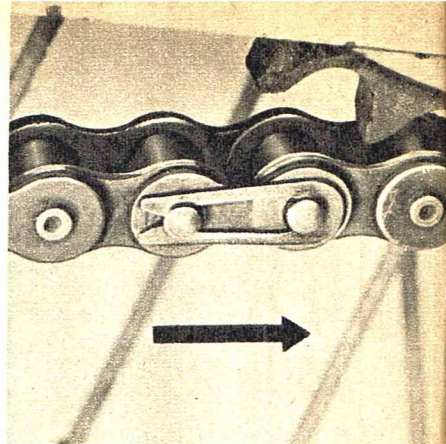
### TIGHTENING FLANGE NUTS

Carburettor flange nuts should never be tightened more than is strictly necessary. Overtightening can result in bowing of the flange and consequent air leaks between it and the cylinder head or, in the case of two-strokes, between it and the cylinder.



### TEMPORARY HOLD

Where the ends of a rear chain can be brought close enough for connecting-link insertion by being pressed between the teeth of the sprocket, in some cases the proximity of the brake drum makes it impossible to insert the link from the back. The solution is to insert a spare link from the front and turn the wheel until the chain ends are clear of the sprocket. The link to be used can then be pushed in—and the spare pushed out—from the rear. You know, of course; how a spring clip should be fitted: the blind end should always lead in the direction of travel of the chain.



### POCKET TOOL KIT

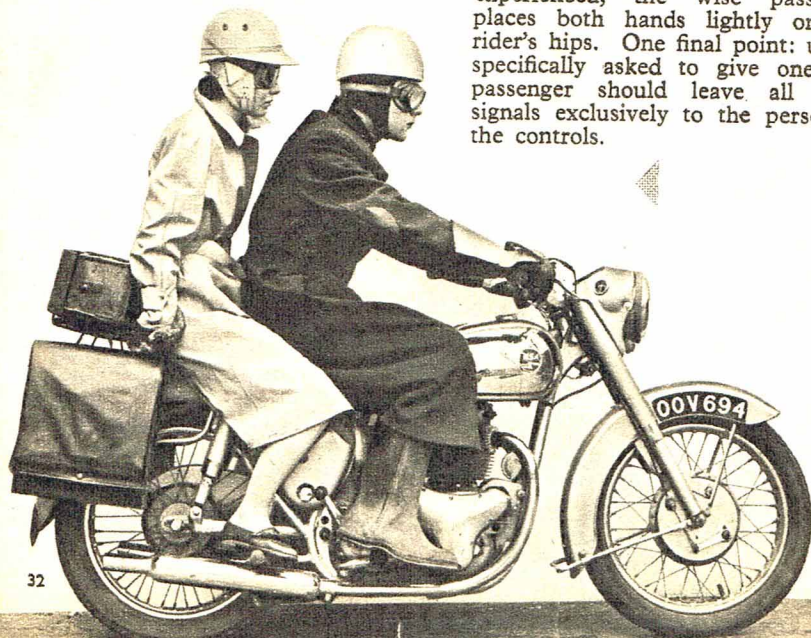
To avoid having to unpack the tool box for a minor need, many riders habitually carry a small set of tools in a handy pocket. Suggested items are a small (up to  $\frac{1}{4}$ in) adjustable spanner, a small pair of pliers and a screwdriver. They should not, of course, be carried loose, since in the event of a spill injury from one of them could result.

### VALVE-SPRING BREAKAGE

If you should be unlucky enough to break a coil valve spring, it is probable that the inner (or outer) spring alone will be sufficiently strong to get you home, albeit at reduced speed. But if that is not so, the broken spring can be removed and the two parts reassembled with the squared outer ends in the middle (in other words, with the broken ends top and bottom).

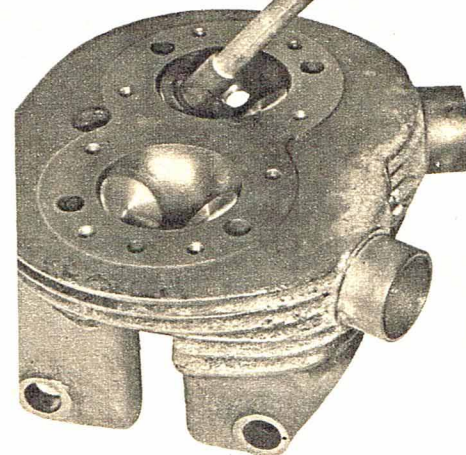
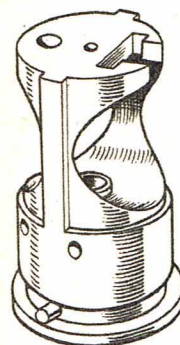
### PILLION RIDING

A pillion passenger should sit close up to the pilot and heel over with him on bends and corners. Unless widely experienced, the wise passenger places both hands lightly on the rider's hips. One final point: unless specifically asked to give one, the passenger should leave all hand signals exclusively to the person at the controls.



### GRINDING-IN VALVES

Where a valve-grinding tool is not available, the sucker from the tip of an arrow in a child's bow-and-arrow set makes an excellent substitute. Sucker is fitted with a handle, stuck on to the valve head and the handle is then merely twirled between the palms of the hands.



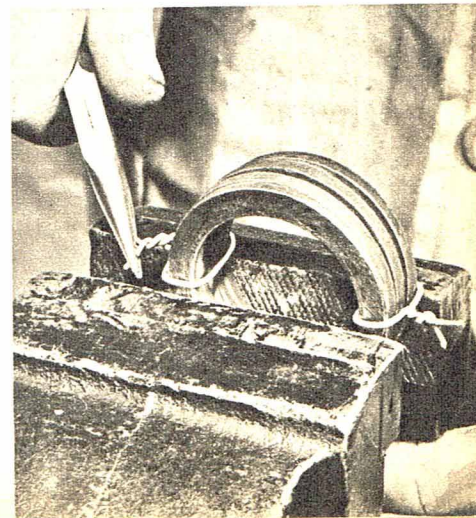
### JET-BLOCK REMOVAL

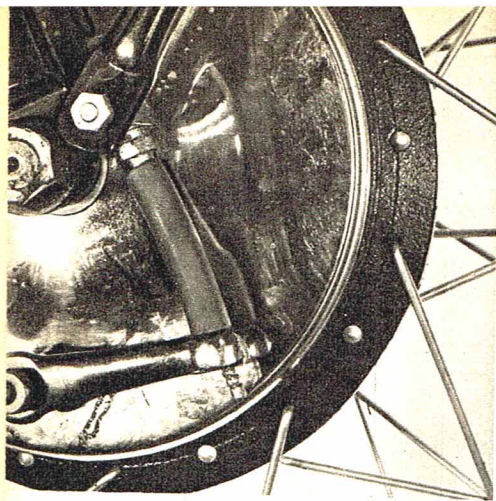
In pre-Monobloc Amal carburetors the jet block is inserted from the base of the mixing chamber. In order to remove the jet block it is necessary to exert downward pressure on it such as with a box spanner inserted from above. If the jet block is tight, the box spanner should be replaced by a soft drift (a stick of firewood will do) which should be tapped gently with a small hammer. The emphasis is on the words "gently" and "small," for the jet block is waisted and very easily distorted. If that happens it can result in a seriously sticking throttle, necessitating a new jet block.

### FITTING A SPRING

Engine-shaft shock absorber springs are notoriously difficult to replace, chiefly because in many cases the spring must be compressed before the retaining nut can be started on

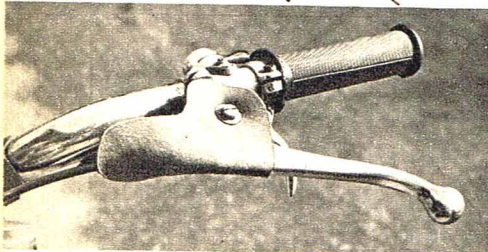
its thread. The spring should first be compressed in a vice and wired up or tied with string so that its effective length is sufficiently shortened to permit the nut to be started. Once the nut has sufficient bite the wire or string can be cut and pulled clear.





### PROTECTING CABLE ENDS

A detail tip, but one well worth adopting, is to protect the exposed ends of brake and clutch cables by means of soft, small-bore rubber or plastic tubing. The tubing serves both to hold in the oil and keep out water and grit. For protecting exposed cables at the handlebar levers scrambles riders (and International Six Days' Trial stars, too) use a cover cut from a 4in square of thick inner-tube or canvas-reinforced rubber material or even from light alloy.



### PLUG WHISKERING

Unknown in the days of additive-free fuels and lubricants, sparking-plug whiskering in two-stroke engines is common today. The whiskering is caused by an electro-chemical bridging of the plug points and then there is no gap across which the current has to flow to produce the spark. Individual engines vary so much in the conditions giving rise to whiskering that several methods may be tried to achieve a cure—or at least a reduction in the tendency. Changing the brand of fuel and/or oil is in itself helpful because it alters the combination of additives; a plug of different heat value or make, and variation of the gap, are other suggested lines of experiment. If a plug does whisker, it can be cleared quickly by running a penknife blade between the electrodes.

### LEAKING FLOAT?

If a carburettor float is suspected of being punctured, a check can be made by immersing it in very hot water. The air in the float expands and the emerging bubbles can be spotted. If boiling water is used, any fuel which may have found its way into the float will be evaporated. A temporary repair can be made by soldering but the solder must be applied very sparingly if the weight of the float is not to be materially increased. The best plan usually is to fit a new float.

### GLOVE DRYING

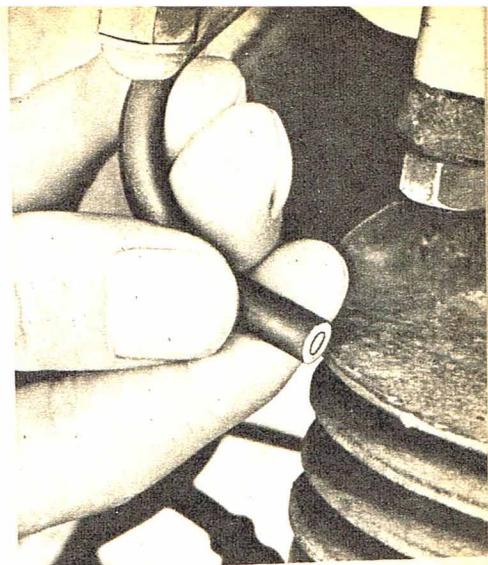
One of the chief difficulties in drying out gloves sufficiently for them to be used the next day is in getting the necessary heat inside the fingers. The hot air from an electric hair dryer, the nozzle of which is inserted into the glove, will do the trick.

### CHECKING THE SPARK

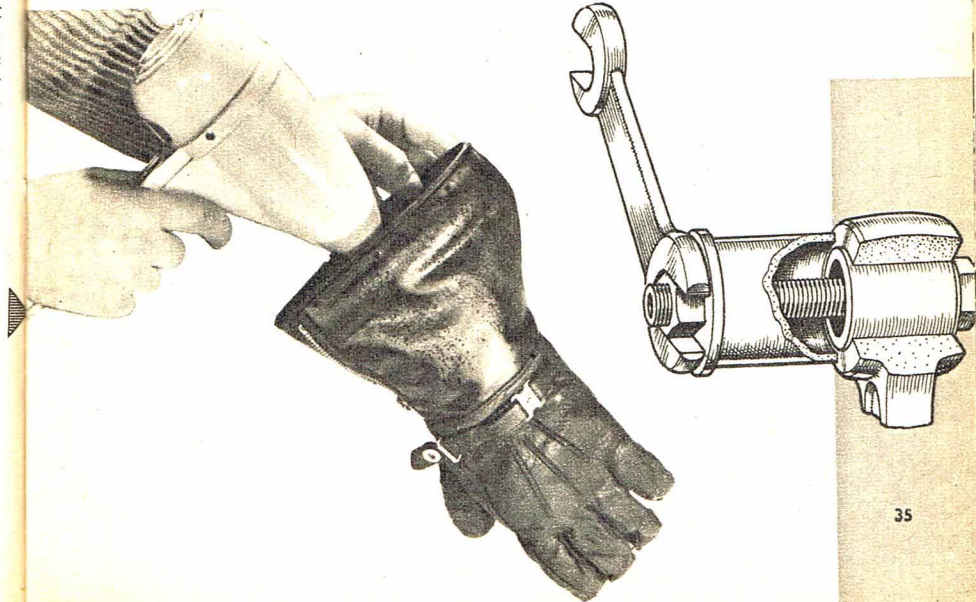
A check on the intensity of the spark at the plug points can be made by unscrewing the plug and laying it on the cylinder-head fins while the engine is turned over by means of the kick-starter. If the plug is suspect the waterproof plug cover (should one be fitted) can be removed from the high-tension lead and the end of the lead held close to a cylinder-head fin. An intense spark then and a weak one in the first test points to a faulty plug. Of course, a weak spark at the end of the lead does not necessarily mean a serious fault in the ignition system. Current will always take the easiest path to earth and a chafed or perished cable will cause a short circuit where it is clipped to, say, a frame tube.

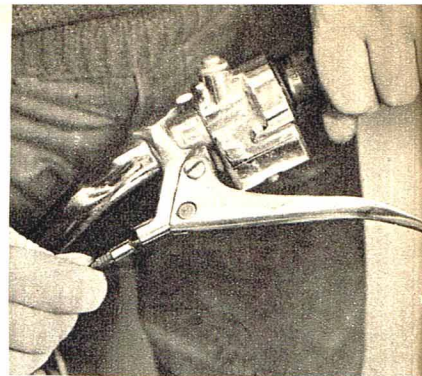
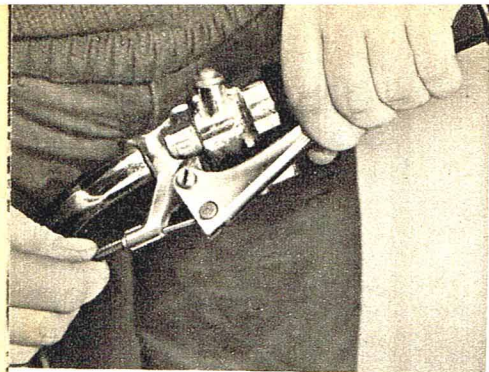
### WITHDRAWING A BUSH

A small-end bush can be withdrawn from the connection rod as follows. Obtain a tube  $\frac{1}{8}$ in longer than the bush and with a bore approximately  $\frac{1}{16}$ in larger in diameter than that of the small-end eye. One end of the tube is then placed against the small-end eye and a  $\frac{1}{8}$ in-diameter bolt with a washer under its head is passed through the small-end bush, then



the tube. The washer must be very slightly smaller than the outside diameter of the bush. A larger washer is put on the end of the bolt followed by the nut. As the nut is tightened, so the bush is gradually withdrawn. To fit the new bush a similar method is adopted but, in effect, the small-end eye serves as the tube. Usually the bush, when drawn into place, requires reaming out until the gudgeon pin is a light push fit.





### WITHDRAWING A CABLE

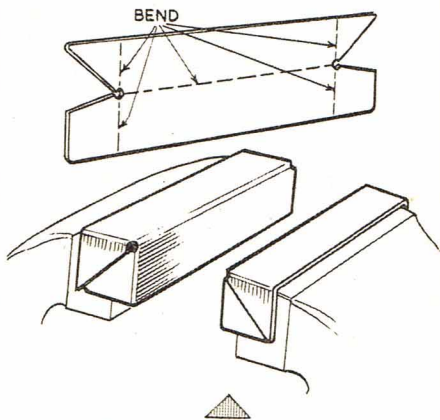
Pressure imposed by the return springs may seem to prevent a clutch or front-brake cable from being readily withdrawn from its location in the handlebar lever. Stand behind the handlebar, pull the lever right up to the grip with the left hand, then grasp the outer casing with the other hand and exert a pull, at the same time letting the lever return to its normal position. The casing will slip out of its housing and the cable can then be moved round until it lines up with the slot in the lever through which it can be moved downward to release the nipple.

### DRAW FILING

When an engineer is using a file to obtain a smooth, finished surface he adopts a method known as draw filing which gets all the "scratchès" running one way. The illustration shows a superfine file lightly gripped between the forefinger and thumb and being rubbed transversely across the job. Final finishing is best done with a piece of well-worn emery cloth.

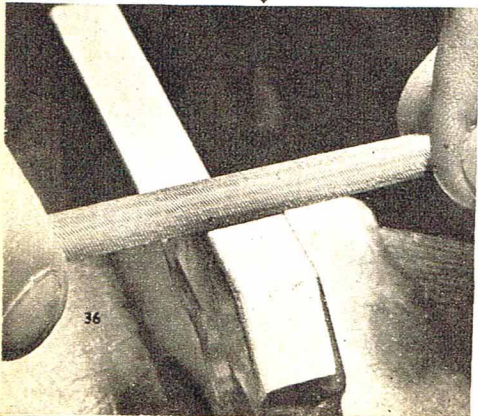
### GRIPPING A SILENCER

Damage to the chromium plating—and even denting—may occur if a silencer is gripped in a vice. One method of overcoming the difficulty is to loop a webbing or leather strap (the wider the better) round the silencer and then grip the ends of the strap—as close to, the silencer as possible—in the jaws of the vice.



### VICE CLAMS

Some manufacturers supply clams of soft metal or fibre to fit over the hardened-steel jaw plates of a vice to prevent damage to finished components such as pistons, shafts and so on gripped therein. If clams are not available it is a simple matter to cut and bend pieces of aluminium or copper for the purpose. The method of cutting out the material is shown in the drawing.



### LOCKING SPUR GEARS

Where timing gears, or primary gears, are of spur type—i.e., with the teeth cut at right angles to the circumference—a means of locking them when their securing nuts are being slackened or tightened can sometimes prove elusive. The best scheme is to use a strip of fibre between mating teeth. Do not use hard metal, such as a steel rod, because the teeth might be damaged thereby.

### STOP AND LISTEN

One of the chief hazards in fog arises when one has to cross a line of traffic—when, for example, making a right turn on to a major road, a manoeuvre which may entail being broadside to the traffic flow for longer than is strictly healthy. However, in such circumstances cars will be travelling in a low gear and hence will be more audible than usual. So stop at your turning, kill the engine, dismount and listen. If you hear nothing you can then push quickly across.

### KEEPING ZIPS FREE

Zip fasteners on overboots in time tend to become clogged by an accumulation of mud and dust particles. However, a remedy is to coat the zip lightly with lanoline (which, of course, is kept away from one's trousers by the boot overlap).



### GEAR SELECTION

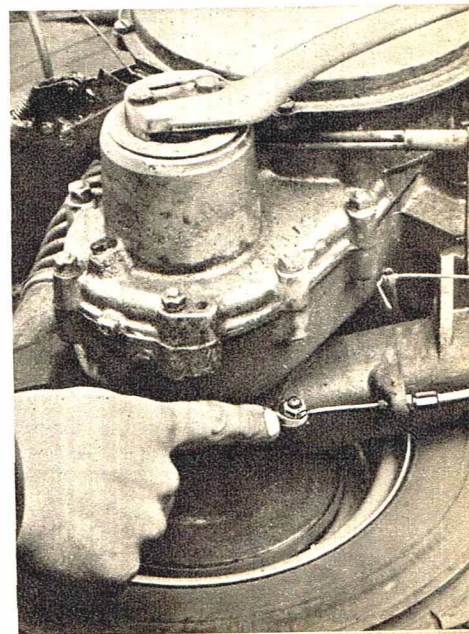
When replacing the end cover of a Burman gear box it is essential that the mating marks on the gear selector quadrant and selector-shaft pinion coincide exactly. Unless they do, one or more gears will be "missing" when the gear box is finally re-assembled.

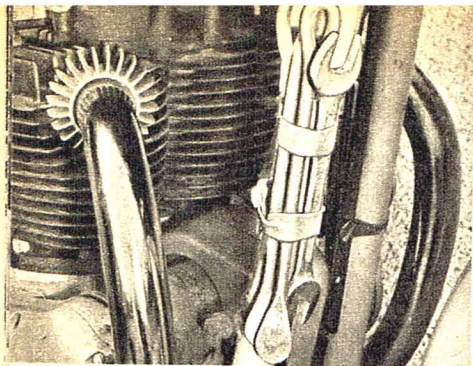
### ENGINEERING DODGE

A bolt or nut, reluctant to start on its thread, can often be persuaded if it is first turned the wrong way (anti-clockwise) until it is felt to settle, then turned clockwise. Other awkward bolts—tank holding-down bolts, for example, where the entry hole cannot be seen—can be started more easily if the end is filed to a taper.

### HIDDEN CABLES

An enclosed machine or a scooter on which the control cables are concealed can lead to a false sense of security. Many of the controls are near the road (under a scooter floor, for example) and can suffer considerably from the ravages of water and road grit. Regular inspection and lubrication are essential.





### CARRYING TYRE LEVERS

As outlined elsewhere in these pages, the best type of tyre lever is of the spoon variety measuring some 14in from tip to tip. Such levers are too long to be housed in most tool boxes. The solution is to carry them externally—taped or held by rubber bands to frame front down tube or to a rear-mudguard stay.

### WINDSCREEN DAZZLE

Sunshine striking the top edge of a windscreen can cause annoying dazzle, especially when one is riding into the sun. A member of *The Motor Cycle* staff has eliminated the bother by applying cylinder black to the top edge and upper  $\frac{1}{2}$ in of his screen.

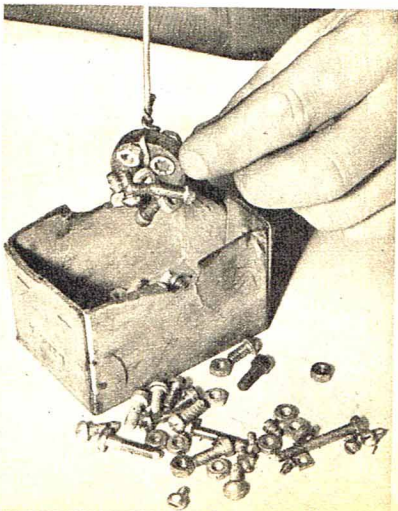


### PETROIL RATIO

Some riders of two-strokes believe that by adding rather more oil to the petrol than recommended by the manufacturer they are playing safe. It is bad policy. It is likely to give rise to irregular running, plug fouling, heavy carbon deposits in the combustion chamber, ports and exhaust system. On the other hand, to use less oil than recommended is to risk piston seizure and, possibly, premature wear and tear on engine components.

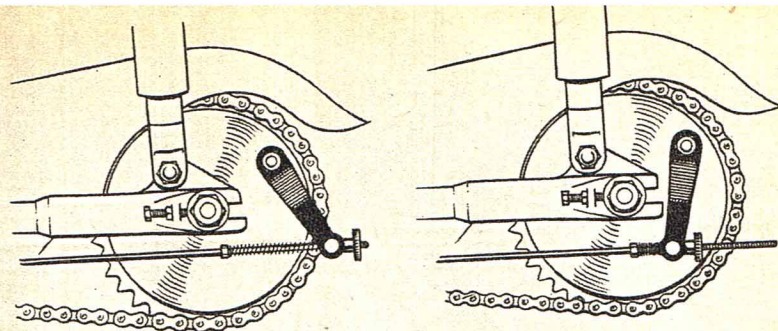
### MAGNETIC SELECTOR

For picking up nuts and bolts from the bench a pocket magnet is a great time saver. The magnet is dipped down into the pile, held over the container and its "load" pushed down.



### RIDING IN FOG

Motor cyclists and scooterists have the laugh on all other motorists when roads are fog bound. What are the tactics? First, keep the speed down. In daylight the headlamp should be kept switched on—not to help you to see but to enable other road users to see you as soon as possible. After dark, of course, a headlamp beam merely serves to throw up a white blanket as the light is reflected by the fog particles, hence at night minimum light is the rule. In not-too-dense fog an amber mask over the headlamp can be a help. If no mask is available some improvement can be achieved by covering the headlamp glass with a yellow duster and securing it with, say, a rubber band.



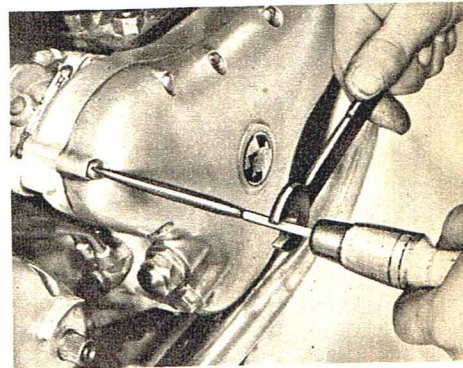
### BRAKE ADJUSTMENT

A visual check as to the condition of the brakes can be made by a glance at the cam lever and the operating rod or cable. When the angle formed by the two is more than 90 degrees (a right angle) the time has come for the linings to be scrapped—or, if the linings are not excessively worn, for shims to be fitted to the ends of the shoes where they bear on the cam. (Some types of brake have adjustable shoe pads.)

### SPANNER AND SCREWDRIVER

When screws are stubborn to the extent that they cannot be turned by means of a screwdriver, a spanner or adjustable wrench can be applied to the blade to provide additional leverage. (It is for this reason, indeed, that some screwdrivers have square-section shanks.) The lower picture shows a lever made up especially for use in conjunction with a screwdriver.

light jobs. For example, work to be filed could be gripped to the table by a carpenter's U-clamp. A few thicknesses of newspaper between the clamp and the table and between the work and the table will help to preserve the surface.

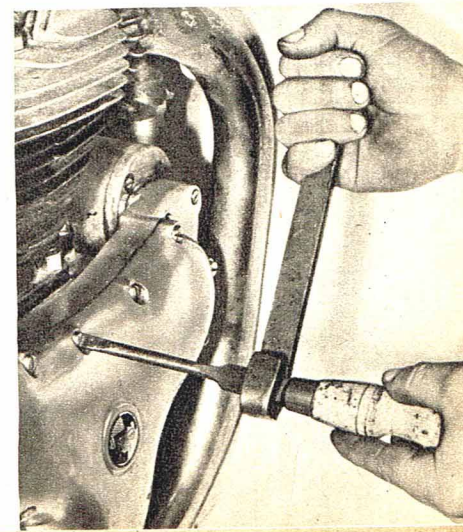


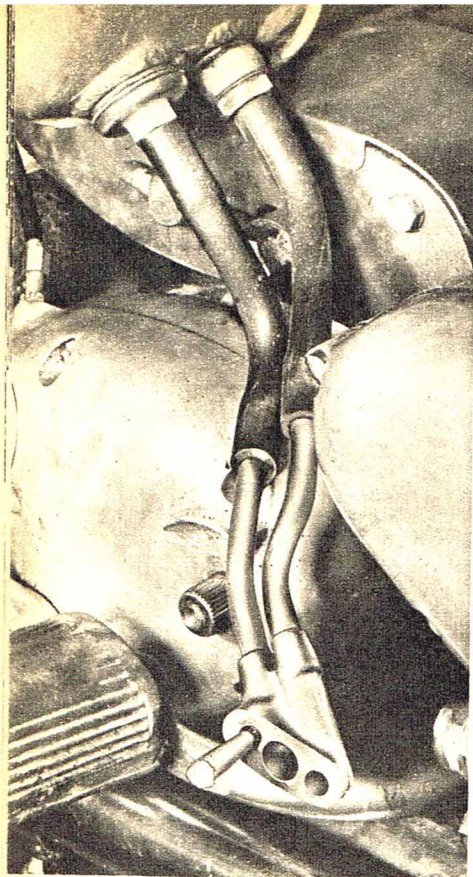
### BUYING SECONDHAND

A novice setting out to buy his first machine should always, if possible, seek the advice of an experienced rider. Alternatively, by joining the Automobile Association or the Royal Automobile Club he can have a machine in which he is interested thoroughly vetted by a qualified inspector for a fee of 30s.

### CARPENTER'S U-CLAMP

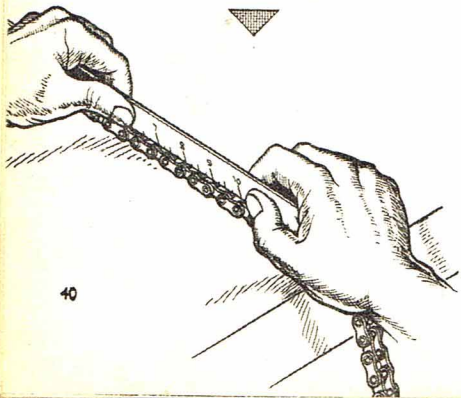
For those who have no garage bench, the kitchen table will often serve for





### MEASURING CHAIN WEAR

The most effective method of measuring chain wear is to lay the chain flat on the bench or garage floor and alternately pull and push on its ends. An eighth of an inch of play per foot is permissible. But when there is approximately  $\frac{1}{16}$  in to the foot the chain is due for renewal.



### DISCONNECTING OIL PIPES

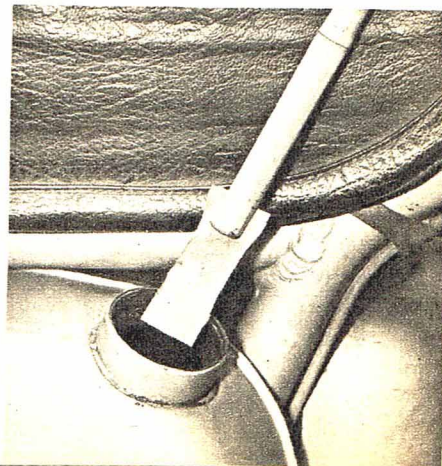
When disconnecting the oil-pipe unions at the timing chest there is no need to drain the oil; the end of the feed pipe can be stuffed with a piece of clean, fluffless rag, or a dummy union with a blind end can be fitted. Alternatively, use a small pencil or the handle of an artist's brush as a bung.

### CONTINENTAL HOLIDAYS

Taking a motor cycle or scooter abroad is becoming increasingly simple. As this booklet closes for press, carnets are required only for touring in Portugal; an international driving permit only for Western Germany, Spain and Portugal. A carnet is a vehicle passport and an international driving permit simply a declaration that you hold a valid driving licence. Both are obtainable only through the A.A. or R.A.C. For trips to countries not requiring a carnet you have to fill in form Sale 39C which enables you to export your machine temporarily. It is obtainable from H.M. Stationery Office or from seaport and airport authorities at points of embarkation.

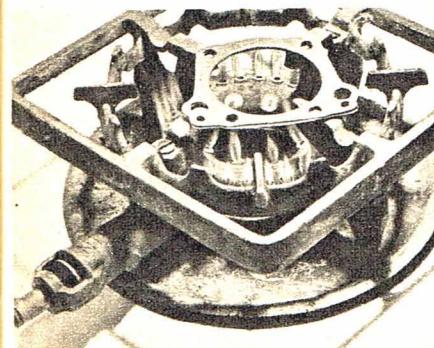
### SLUDGE REMOVING

A squeegee made up from a foot or so of garden cane and slotted at one end to take a piece of rubber sheet measuring approximately  $1\frac{1}{2} \times \frac{3}{4}$  in is useful for maneuvering oil-tank sludge out of the drain-plug orifice.



### REMOVING A BROKEN STUD

Should a stud break off close to a machined surface care has to be taken over its removal lest the surface finish be marked. The solution is to centre-punch the stud and then to drill a hole of a diameter small enough to prevent the drill from reaching the female thread. A small, square-section taper punch can then be tapped lightly into the hole and the stud withdrawn by the method illustrated. If no suitable punch is available and the stud is not too tight the tang of a file may be used—though a file is brittle and must never, on any account, be highly stressed or given a sharp blow.

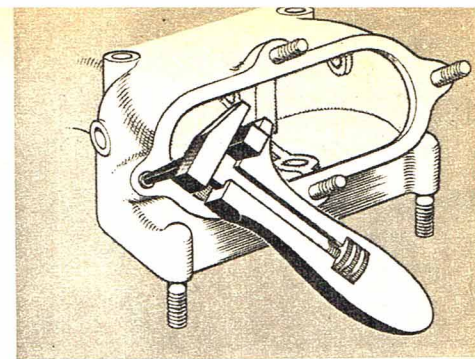


### ANNEALING A GASKET

Copper cylinder-head gaskets in time become hard and "lifeless." If this happens the gasket must be softened by annealing. It should be heated on a gas ring or stove until it reaches a temperature at which it begins to discolour and then plunged into a cold-water bath. A good scheme when refitting a copper gasket is to smear a little grease—very little—on the upper and lower surfaces, to ensure that it is free to "float" slightly and so line itself up properly when the cylinder-head bolts or nuts are being tightened.

### CLUTCH-CABLE ADJUSTMENT

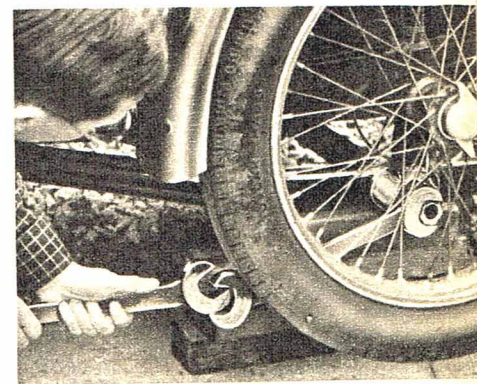
On the majority of motor-cycle gear boxes there is an adjuster at one end of the clutch thrust rod and another

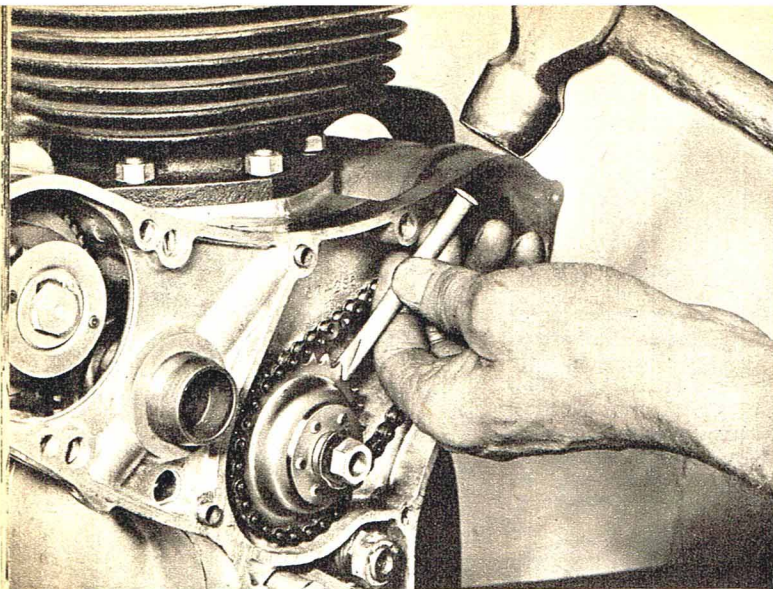


on the cable. In some cases (in the A.M.C. clutch, for example) the thrust-rod adjuster may govern the operating clearance in the thrust mechanism and must be correctly set before the cable clearance is adjusted at all; in others the two are complementary. In the second instance the adjuster on the thrust rod should be used to ensure that the operating arm makes the most advantageous angle with the cable—90 degrees at mid-travel—and does not foul the housing at either end of its movement.

### INCREASED LEVERAGE

For nuts that are very tight additional purchase can be obtained in the manner shown. One spanner is interlocked with another so that the effective leverage is in fact doubled. Care is necessary to ensure that the spanners do not slip out of engagement. The scheme should not be used for tightening, for fear of stripping the threads.



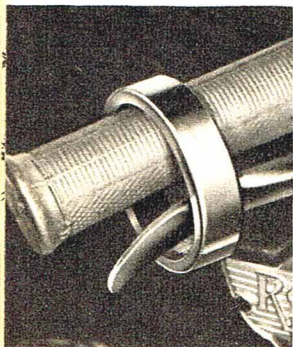


#### NAIL-VARNISH SEAL

The great majority of machines are nowadays fitted with plastic fuel pipes. If a crack should develop a spot of clear nail varnish will provide a temporary seal until such time as a replacement can be bought.

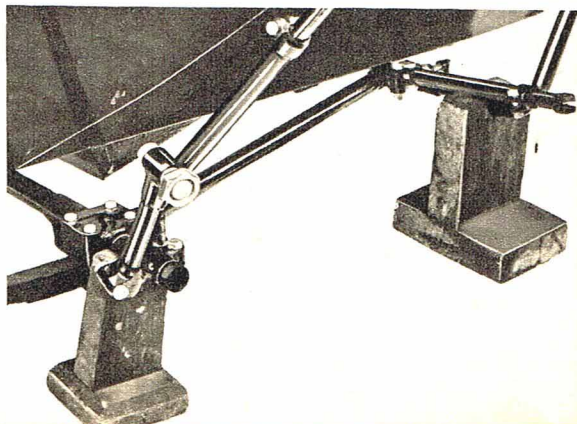
#### PARKING A SIDECAR

Engaging bottom gear and turning the front wheel into the kerb does not provide a perfect safeguard for leaving a sidecar outfit parked on a steep hill. An additional precaution is to lock the front brake on by means of a metal ring of suitable diameter (say, an old bearing outer race) slipped over the handlebar and brake lever.



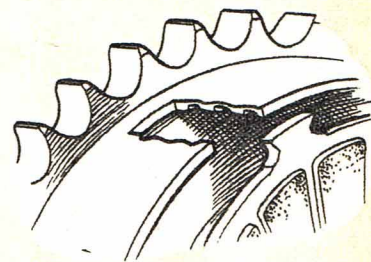
#### JARRING A TAPER

It often happens that a sprocket fitted on a taper shaft is so close to its housing (for example, an engine's magneto driving sprocket with very little clearance between it and the lips on the timing chest) that there is no room in which to employ a sprocket puller. In that case the solution is to jar the sprocket off its taper. A chisel-shaped punch is used, either in light alloy or brass; its business end is placed right down in the trough between two sprocket teeth and the other end given a sharp blow or two with a light hammer. The jarring effect does the trick. Naturally the securing nut should be slackened first and the chain, too, given increased slack.



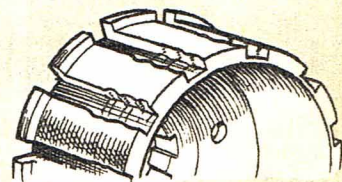
#### WORN CLUTCH

When the clutch-plate tongues or the slots in the clutch drum are badly worn, repair is usually possible. Generally the tongues or grooves can be built up by a local welder (the charge will be only a few shillings) and then filed to the correct shape. Slight wear can be rectified by filing alone. Some backlash between the tongues and their grooves is permissible, though the clutch is likely to prove slightly noisy when it is disengaged.



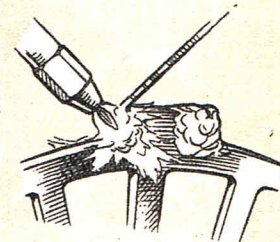
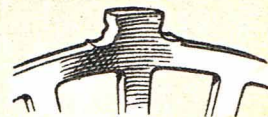
#### BATTERY CARE IN WINTER

During the November-February period the battery should always be maintained as near fully charged as possible. A low state of charge can result in a freeze up and consequent damage to the plates and casing. If the machine is not in use a freshening charge should be given at intervals of not more than a month assuming the battery is in good condition. If it is oldish and tends to lose its charge more quickly than normal, refreshers may be required at fortnightly intervals.



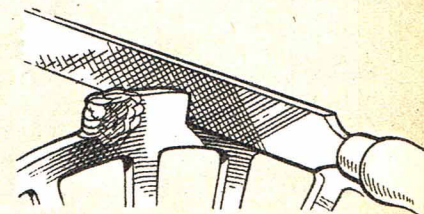
#### FREEING TIGHT NUTS

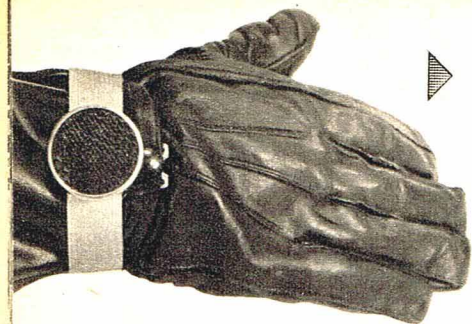
As well as being a rust solvent, paraffin possesses excellent penetrating qualities. Hence nuts which are apparently seized tightly can generally be freed if paraffin is applied at the thread and at the mating surfaces between the nut, its washer and the face against which it bears.



#### SIDECAR SUPPORTS

Bricks, of course, can be used to support a sidecar axle rail and front chassis tube when the sidecar is being offered up to the machine. But bricks can topple over. A much better scheme is to make up simple wooden stands of the type illustrated. The rearward stand is removed first and the ball joint coupled up. The sidecar is thus firmly supported by the rear connection and the wheel. The front stand can thus be pulled away and the swan neck connected.





### SIGNALLING AT NIGHT

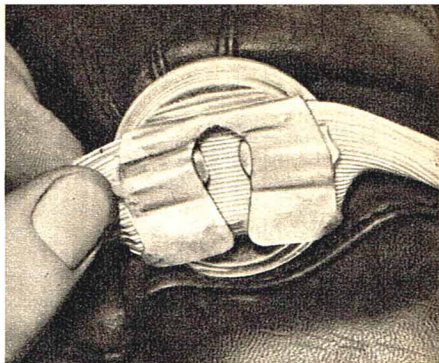
Riders whose gloves are not fitted with reflective backs can ensure that their hand signals are readily seen at night. The scheme is to obtain two cycle-type red reflectors and to attach them to rubber or elastic bands. They are then slipped over the gloves.

### BROKEN CLUTCH CABLE

Should the clutch cable break on a machine on which the thrust rod is actuated by an external lever on the gear box the problem is not very serious. The clutch can be operated by pressing on the lever with one's right heel. If the lever is inside the gear-box casing one must ride without using the clutch. Provided the machine can be kept on the move there is little difficulty. With motor-cycle and scooter gear boxes, clutchless gear changes are easily executed. The snag arises when you have to stop and restart. The technique then is to drop down into bottom gear, close the throttle and let the engine stall.

### TO GET GOING

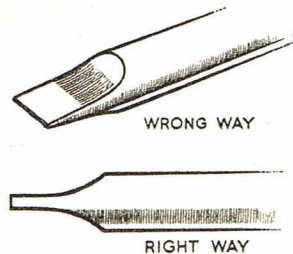
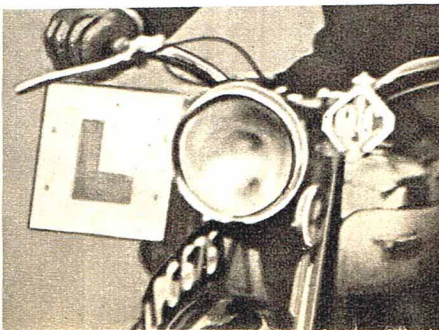
Restarting is then accomplished in racing style but with a variation. With bottom gear engaged the machine is pulled back against compression—that is, until the piston is just below top dead centre on the compression stroke. Then, select neutral, close the throttle and push the machine forward. When a fast walking pace (or a slow trotting pace) is reached engage second gear. In normal circumstances the engine will



fire and you can leap aboard. With a powerful machine restarting by this method may be difficult unless someone helps you push when the gear is engaged. Usually a passer-by will oblige if asked politely. Should your machine be fitted with an exhaust-valve lifter or decompressor bring it into operation before selecting second gear and release the lever after you have taken a few steps with the engine turning over.

### FIXING L PLATES

There is generally no difficulty over fixing an L plate to the rear of a motor cycle. The problem arises when one is to be fitted at the front end (especially in winter when the headlamp must be left unobscured). One scheme is to make up a right-angle bracket from light-alloy or mild-steel strip. One leg of the bracket is drilled with a hole large enough to go over one of the headlamp mounting bolts, and the other with two 1/4-in-diameter holes for mating up with holes drilled in the plate. In the case of a machine equipped with a nacelle or fairing the bracket can be fitted to a fork clamp bolt or to one of the top fairing-mounting bolts.



### SCREWDRIVER SHAPE

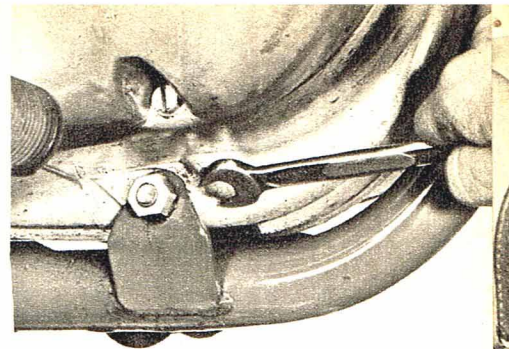
How many know the right and wrong way to grind a screwdriver blade? The accompanying illustration shows the right and wrong methods—we leave it at that!

### SCRATCHED ENAMEL

Surface scratches on tanks or mudguards, scooter and sidecar bodies may not be bad enough to warrant respraying and the consequent problem of matching colour. One solution is to polish the scratched area by using a liquid chromium cleaner and soft rag. The polishing rubs down the surrounding enamel—rather like using wet and dry paper but with a less abrasive action—and the enamel tends to spread into the scratches. Finish by polishing with a clean duster and then apply several coats of a good-quality wax polish. By that method the surface can be restored to give a virtually as-new appearance.

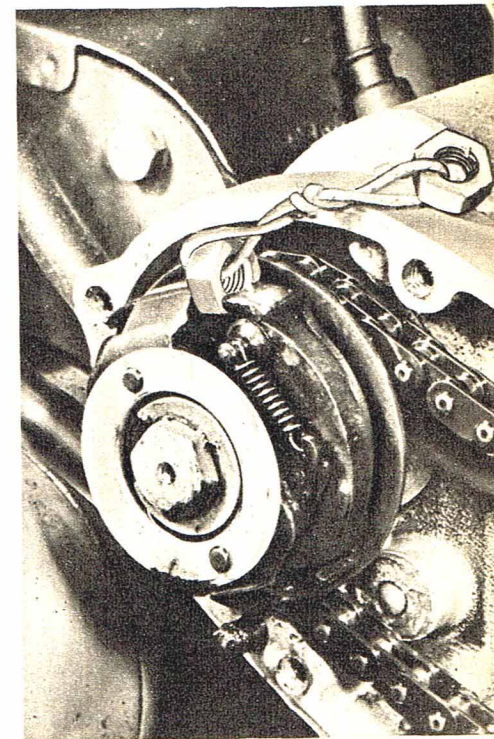
### HOLDING FULL ADVANCE

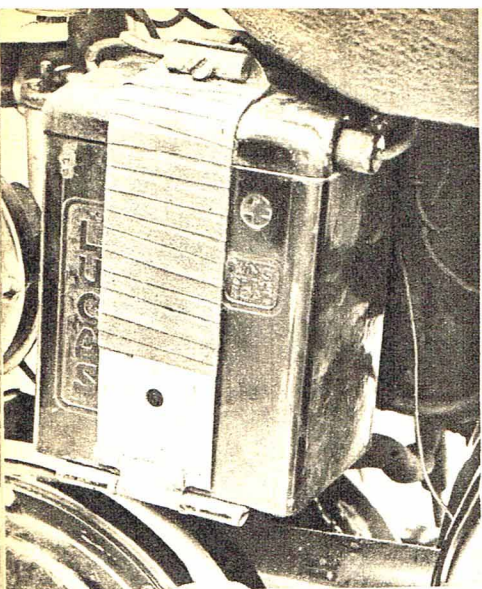
To hold the governor of a Lucas magneto automatic advance - and - retard unit on full advance while timing an engine first turn the governor to tension the springs. The picture shows the next step adopted by a bright mechanic in the Norton service department. He places a nut between the fixed and moving members—and attaches to the nut a piece of string and another nut so that the "tool" will not be inadvertently left in position when the timing cover is replaced.



### CRANKCASE DRAIN PLUG

If excessive carburettor flooding results in the crankcase drain plug of a two-stroke engine having to be removed, it is imperative that the plug be firmly screwed home again. Should a drain plug be lost a cork of suitable size, "screwed" into place, or even a piece of stick, will make a temporary substitute.



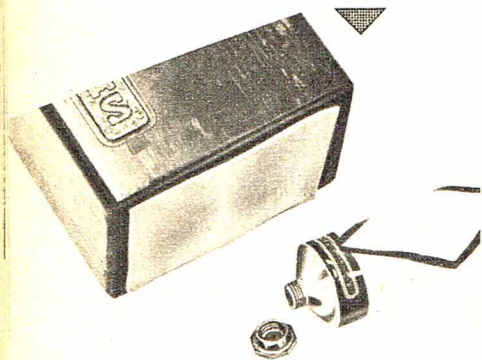


### PROTECTED BATTERY

Even when a battery is securely located, the case is liable, after a time, to become scarred in the vicinity of the metal straps. The damage can be prevented by binding the straps with insulating tape or attaching thin strips of rubber to their inner faces. A rectangle cut from a discarded inner tube or from a foam-rubber sheet and stuck by Bostik to the bottom of the battery will provide additional protection.

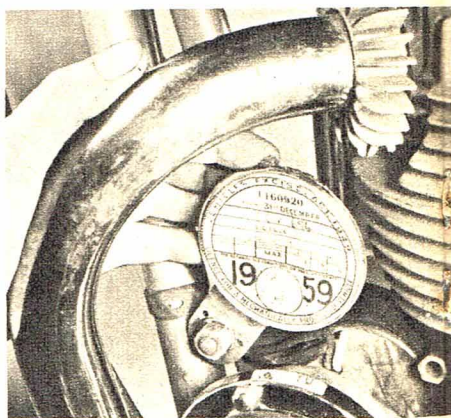
### REGISTRATION BOOKS

Possession of the registration book should never be taken as a guarantee of ownership of the machine concerned. Some log books, indeed, are not even accurate as regards details. Hence if the date of registration does not appear to tally with the machine—a model you may be keen on buying—check with the manufacturer. Provided you supply the engine and frame numbers the factory can tell you when the machine was built.



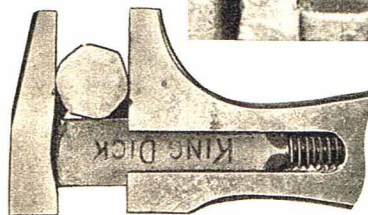
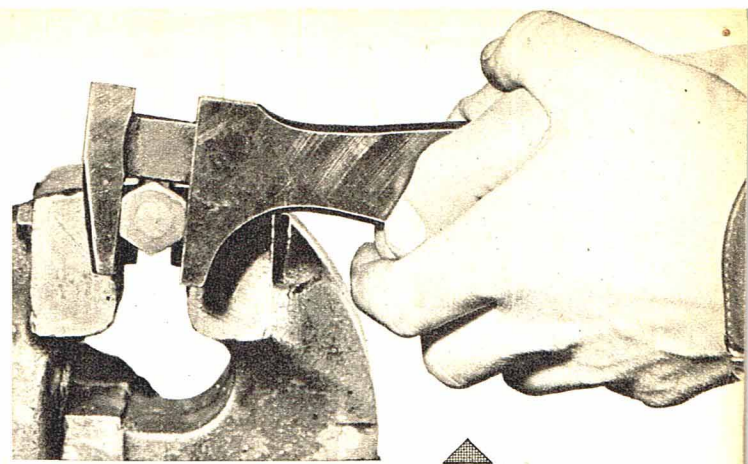
### AN EYE FOR CAMBER

Having an eye for camber constitutes one of the hallmarks of roadmanship. To heel hard over on an adverse camber is to invite a skid. The aim should always be to use camber to one's advantage; for instance, positive camber can mean that though banked over, a machine remains approximately at right angles to the road surface; that is, in relation to the road the machine remains substantially upright. On adverse cambers, particularly where the road surface is loose or has worn smooth, gentle throttle work and gentle braking are essential if skids and the risk of a spill are to be avoided.



### LICENCE DISCS

The threads of a licence holder should be smeared with grease each time the disc is renewed. If this precaution is not taken rust forms at the threads so that it may become all but impossible to remove the rim, say, 12 months hence.



### PASSENGER COMFORT

Because of the centrifugal-force effect when a sidecar outfit is driven round corners, a handhold for the pillion passenger is a useful fitment. A leather strap can be attached top and bottom to a convenient member of the sidecar body; for example, on a two-seat saloon model to, say, the pillar between the off-side windows.

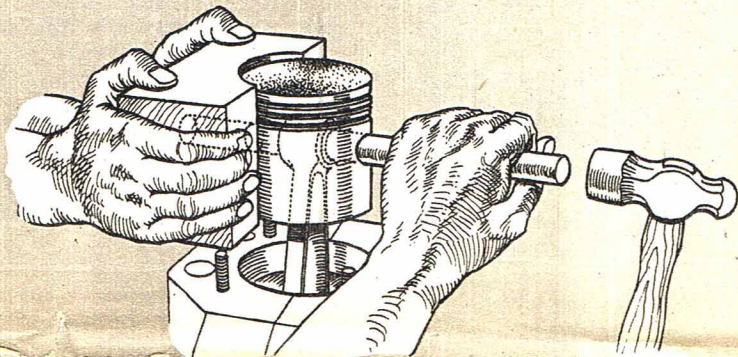
### ADJUSTABLE SPANNERS

No engineer worth his salt will use an adjustable wrench when a spanner of the correct size can be used instead. But when an "adjustable" must be employed, he will ensure that the knurled or grooved adjusting ring is set so that the jaws grip

the nut or bolt head as tightly as possible. If there is free play between the jaws and the hexagon, and hard pressure is to be applied, the edges of the flats may be damaged to the extent that a spanner of the correct size will not afterwards slip on as it should. There are right and wrong ways of fitting an "adjustable." The turning moment must be applied *towards* the jaws so that the tendency is for them to close up.

### REMOVING A GUDGEON PIN

On no account should a gudgeon pin be driven out of a piston unless the piston is supported on the opposite side. If a really firm support is lacking the connecting rod will almost certainly be bent. One safe method of supporting the piston is by using a block of wood profiled to fit snugly round the piston and with a hole through which the gudgeon pin may pass. Care is necessary also to ensure that the drift employed is a free fit in the gudgeon pin bosses in the piston.







### FAULTY EARTH

Corrosion is the enemy of all electrical circuits. When the headlamp switch is operated and, say, the tail-lamp or sidecar lamps fail to respond a likely cause of trouble is a faulty

earth contact where the lamp is attached to the number plate or mud-guard. A smart tap with a clenched hand will usually produce results. The remedy, of course, is to clean away any rust formation at the lamp flange. Another cause of poor continuity is between the bulb and its contacts; bulbs and holders, as well as the "pips" in the base of the bulb, must have good contacts.

### INSTRUCTION-BOOK COVER

So that it is handy for quick reference, your instruction book probably spends the great part of its life in your garage or shed, with the result



that its covers in time become very grimy. An additional cover made from a plastic bag or sheet (polythene is impervious to oil) will provide the necessary protection. The edges of the plastic can be stuck to the inside surfaces of the cover with transparent adhesive tape.

### MONOBLOC TUNING

To tune an Amal Monobloc carburettor for economy the throttle needle can be lowered by one notch from the standard setting. Throttle valve cutaway can be increased—i.e., by fitting a replacement slide with greater cutaway—but the mixture should not be weakened to the extent that acceleration becomes "patchy" when the throttle is

opened quickly. On oldish models a new needle jet will often be found to provide an improvement—needle jets wear. . . . Pilot air screws should be set to furnish as weak a setting as possible consistent with reliable idling. The pilot jet itself must be properly tightened, since otherwise there may be a leak between the jet and its holder. Finally, a check should be made to ensure that the rubber tube connecting the air filter and air intake is not distorted or fitted in such a way that it is affecting the supply of air to the main-jet system. If that is happening there will be erratic running and, possibly, high fuel consumption. A dirty air filter will also, of course, cause heavy consumption.

### CIRCLIP TOOL

An excellent tool for removing circlips which have no loops on their ends can be made from an old screwdriver. The end should be shaped

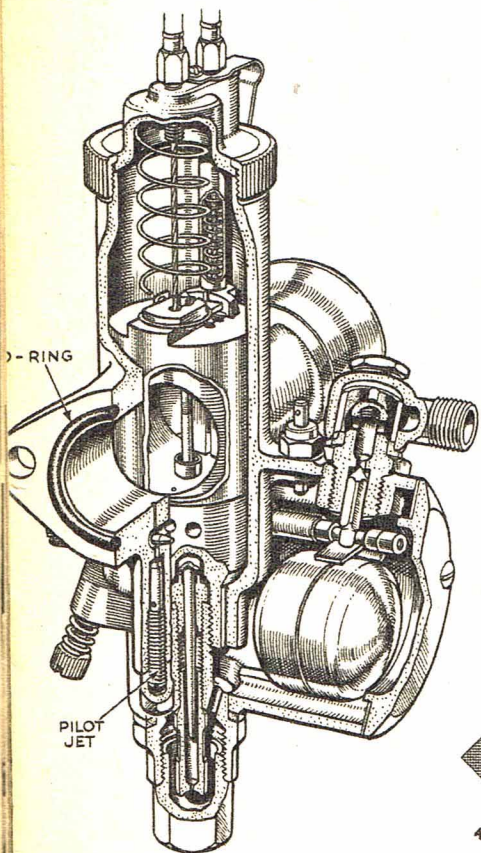
by grinding into a hook-like pointer. Its width is such that it will slide easily into the small, vertical grooves machined in the piston just below each gudgeon-pin boss.

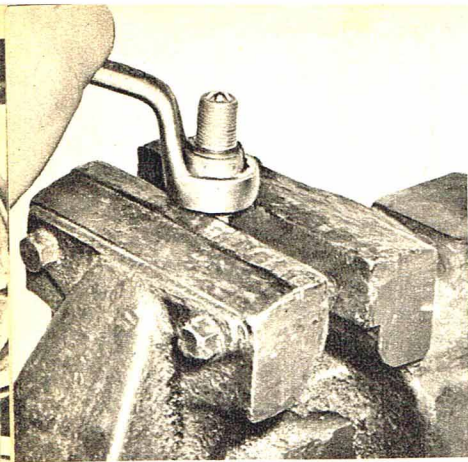
### WET IGNITION

When an engine is sopping wet and the ignition cuts out the plug (or plugs) should be inspected to ensure that its gap is not too wide. When the plug body and high-tension lead are damp the current will feed back externally instead of overcoming the "obstacle" of jumping the excessively wide gap.

### CIRCLIP REFITTING

When refitting circlips which have no loops at their ends, the gap should be positioned at "seven o'clock." In this way subsequent removal is very much easier because a hook-shaped tool can be inserted close to the gap and one "tail" of the circlip readily prised out.





### DISMANTLING A PLUG

The approved method of dismantling a sparking plug of detachable type is the reverse of what seems obvious. The recommendation is that the smaller of the two hexagons (the gland nut) is gripped, *lightly*, in the vice while a ring or box spanner is applied to the larger hexagon. In this way any possible distortion of the body is avoided.

### POOR GEAR CHANGE

In many instances a poor gear change can be directly attributed to clutch drag—to the plates refusing to free when the handlebar control is operated. In the case of a wet clutch—one designed to run in oil—there may be too much oil in the primary chaincase or the oil may be too thick. Linings that ought to run dry but have become impregnated with oil can be degreased to some extent by washing in petrol or boiling in a strong solution of household detergent though the odds are that they will have to be renewed. Other possible causes are wear of the slots in the clutch drum or centre unit; wear of the clutch sprocket bearing; or incorrect adjustment of the thrust mechanism or springs.

### FLASHING-LIGHT CODE

Do you understand the significance of signals flashed by drivers of heavy lorries? The aim is to help the other

man. Briefly, the form is this: flickering of both lamps, "your road, proceed"; a steady flash, "stay put, I am coming through"; the tail lamps switched off and on, "I cannot tell you precisely what I am going to do but hold back for a second or two"; repeated urgent flashing of the headlamps, "your lights are not working properly".

### PROTECTING CLOTHING

To prevent damage to clothing through chafing in pannier bags or cases, place all the articles in a large polythene bag. Alternatively, different items of kit may be separated by



the use of several bags of smaller size. An additional advantage of both schemes is that if water penetrates the pannier the clothing is kept perfectly dry.

### CUTTING PLASTIC

The transparent plastic material now widely used for sidecar windows should not be cut in a very low temperature. In winter, for example, the material should be warmed—in hot water or by being held in front of a

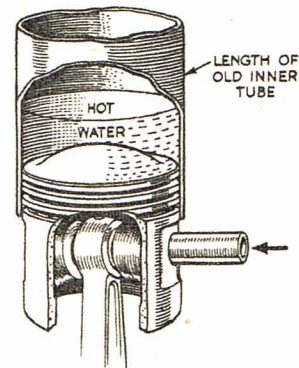
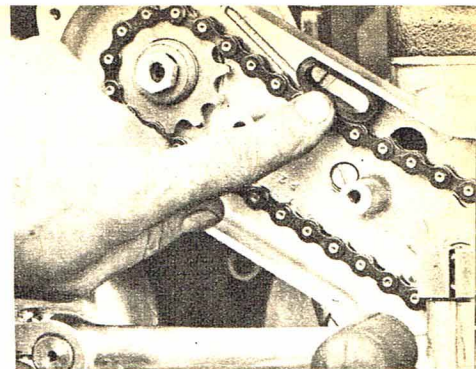
fire—before it is cut. Sharp tinsnips should be used and the scrap should be kept on the left-hand side of the snips to prevent cracking or splitting of the material.

### TIMING A MAGNETO

When a magneto is being timed slack in the driving chain should not exceed  $\frac{1}{4}$  in. If the slack is greater accurate timing will not be achieved: with a chain that is very loose the variation in timing can amount to several degrees. Hence when the engine is being timed a rubber ring or  $\frac{1}{4}$  in of garden hose should be placed between the upper run and the timing chest casting to tension the bottom run. Remember to remove the ring after use. . . .

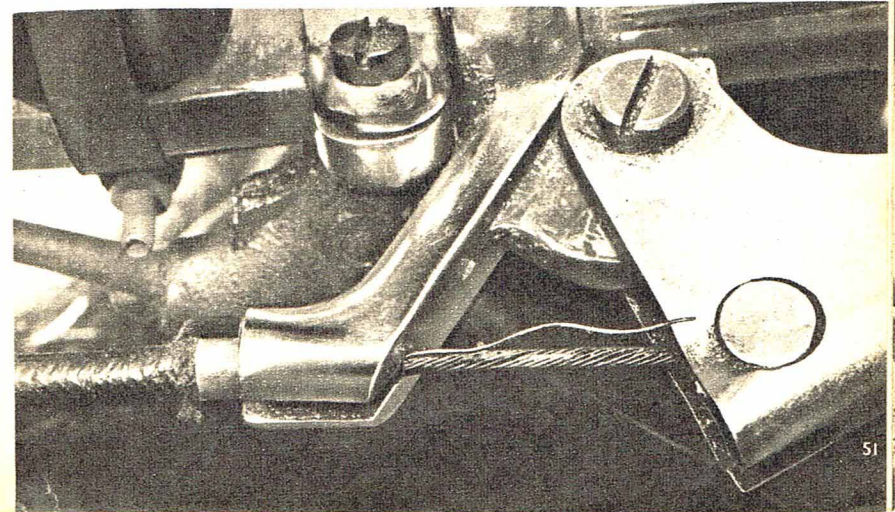
### WARMING A PISTON

When a piston is being fitted outdoors in cold weather it is difficult to obtain enough heat to expand the piston sufficiently for the gudgeon pin to slip home easily by the time-honoured method—by using a cloth damped in hot water. But if a few inches are cut from an old inner tube, slipped over the piston crown and secured by wire if necessary, hot water can be poured into the resulting "tank." Another method, if a mains supply is at hand, is to use an electric iron which should be held tightly against the piston crown.



### FRAYED CABLE

When a control cable becomes very heavy in operation the odds are that one of the strands has frayed. When that happens the time has arrived for the cable to be replaced. One frayed strand should always be regarded as the danger signal; the others will break very soon afterwards.



### CHOKED JET

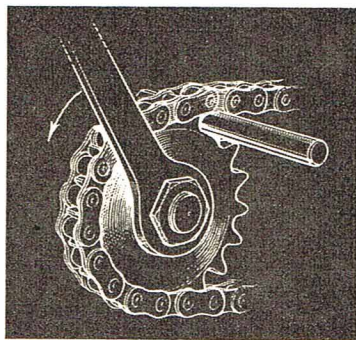
Most of us know that the symptoms of an obstructed main jet are misfiring at wide throttle openings. But is it as widely known that a jet should never be cleared by passing a wire through it? If the orifice is not to be damaged—or enlarged—obstructions should be cleared by blowing through the jet or by use of a bristle.

### TOO-HIGH WINDSCREEN

A Perspex windscreen that remains too high for the rider to look over even when it is at its lowest setting can be modified by one of two methods. A strip can be cut from the top by means of a hacksaw and the edge cleaned up with a file and finally by fine glass paper. Provided the screen is held so that the material is always firmly supported close to



the hacksaw blade there is very little danger of splitting taking place. The second method varies according to the design of the screen. If it is of fairing type, new holes for the blade-mounting bolts can be drilled higher up (the amount depends on the extent to which the screen is to be lowered). Drilling is done with a normal twistdrill and again the only proviso is the material be firmly supported, in this case immediately below the drill. For non-fairing screens the second scheme is to cut at the bottom and once again drill new holes for the mountings. Of course, this plan is not recommended where a screen is profiled to fit snugly over a headlamp or nacelle.

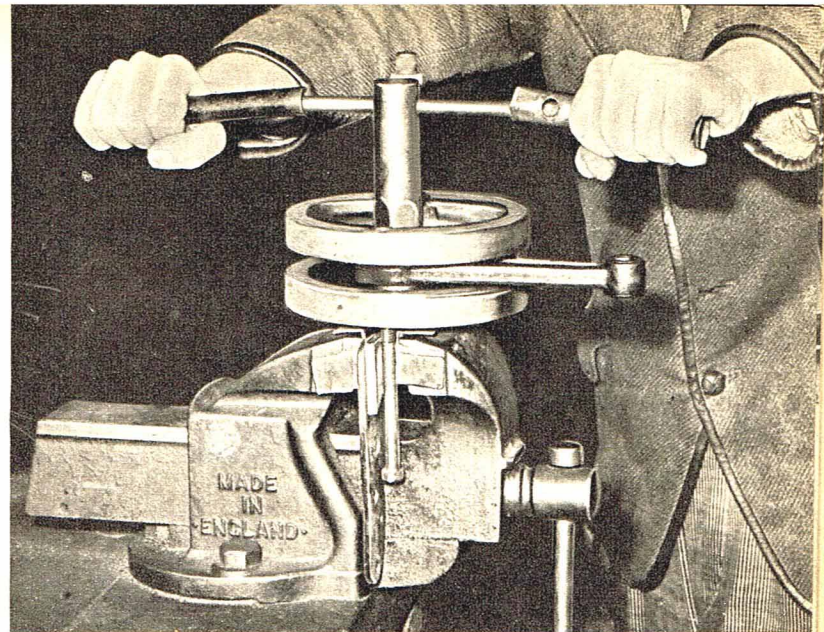
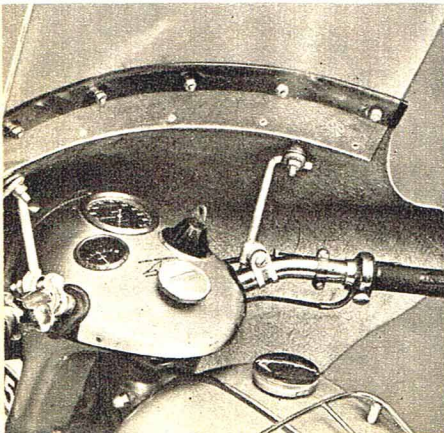


### TURNING SPROCKET

In order to prevent an engine sprocket from turning while it is being tightened or loosened a scheme is to engage bottom gear and apply the rear brake. However, should the rear wheel, rear chain, or brake pedal not be in position, that procedure is ruled out. The illustration shows the solution. A tommy bar inserted between the sprocket teeth and the chain makes a powerful "lock."

### INCREASED PURCHASE

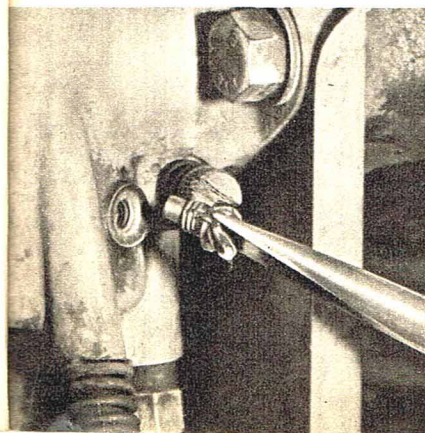
In the event of insufficient leverage being obtained to loosen a stubborn nut a spanner can be applied to the end of the one being used to give



double the leverage. In the case of a tommy bar being employed in conjunction with a box spanner, small-diameter tube spanners can be slipped over each end of the tommy bar and used as "handles."

### STARTING A SCREW

To start a screw in an inaccessible hole a blob of grease is placed on the screw head. The grease holds the screw to the screwdriver blade. Alternatives are a stiff tag of card, which is a tight fit in the screw slot, or a piece of very thin copper wire which can be pulled away when the screw has been started.



### HEAVY REPAIRS

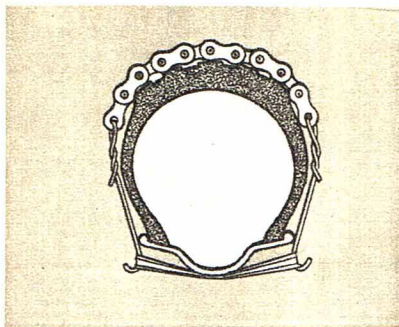
Should you have a sidecar connection or pannier frame break during a holiday trip, remember that some of the larger firms now employ a welder-blacksmith. There is sure to be one in practically any agricultural area.

### BEARING LUBRICATION

Over-frequent use of the grease gun on hub bearings can result in the lubricant finding its way into the brake drums to the detriment of the linings. The best procedure is to dismantle the hub, say, once a year and repack the bearings with grease. The gun is best reserved for other uses.

### PAINT STORAGE

If, after the lid has been firmly replaced, a partly used tin of enamel is stored upside down, a skin will not form on the surface. Another scheme is to pour carefully on top of the enamel a shallow covering of cellulose thinners. Use turpentine substitute on paint. Keep the lid tight, and the tin upright; avoid shaking the tin.



### SNOW CHAINS

Additional wheelgrip in snow can be obtained if simple chains are fitted to the rear wheel. They are easily made from short lengths of cycle chain extended across the tyre tread. Each chain is held in place by wire hooks joined across the rim by means of stout rubber bands cut from an old inner tube.

### OVERTIGHTEN FIRST

When adjusting a primary chain it is best to overtighten slightly at first and

then to slacken back the drawbolt. That eliminates any possible backlash in the adjusting mechanism.

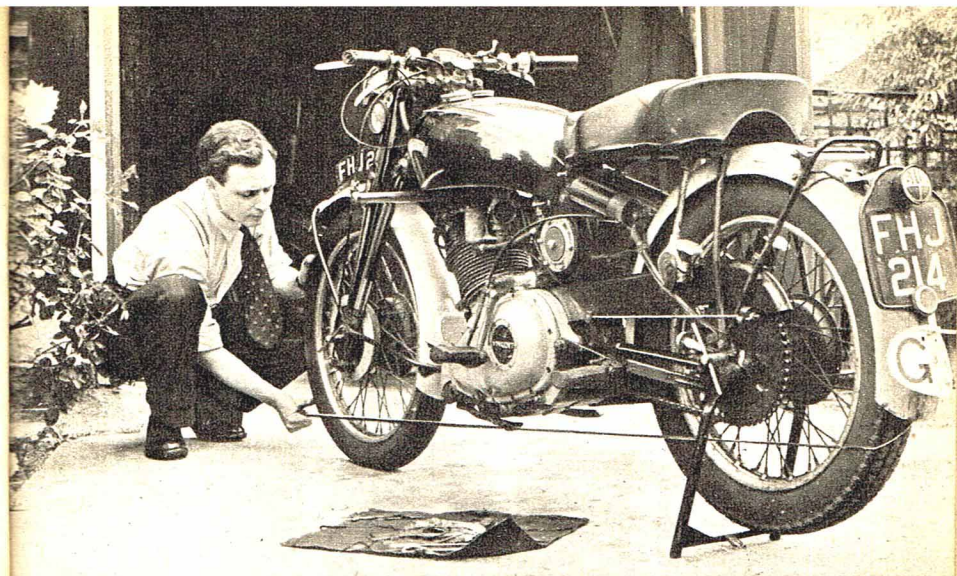
### CHECKING ALIGNMENT

To make a rough, visual check on wheel alignment one has to get one's eyes as near ground level as possible. The scheme is to stand a few feet away from the machine with your back to it; then bend down until you are looking between your legs. A "sighting" can then be taken along the wheels.



### STRING AS STRAIGHTEDGE

For a more accurate check on wheel alignment attach a stout piece of string to the rear-wheel spokes, pass it round the back of the tyre and pull it taut to the front of the machine, aligning it to the front tyre. The front wheel is then turned so that the tyre touches the string in two places. That done, it will be seen at once whether the back wheel is in line with the front. Remember, however, that if the back and front tyres are of different section due allowance has to be made. As a check the alignment should be tested first at one side and then the other. The gap resulting from the smaller-



section tyre should be the same at each side of the appropriate wheel.

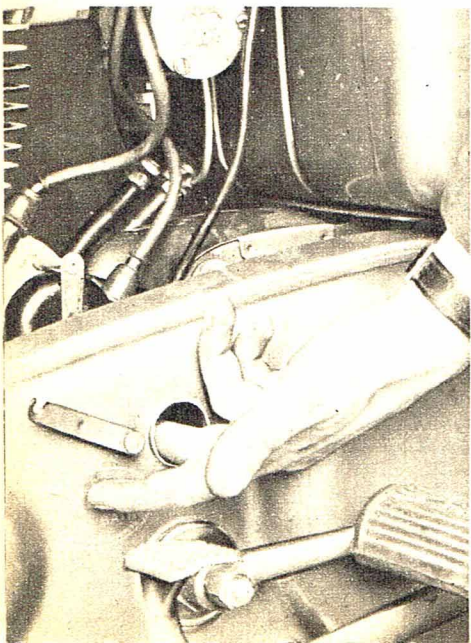
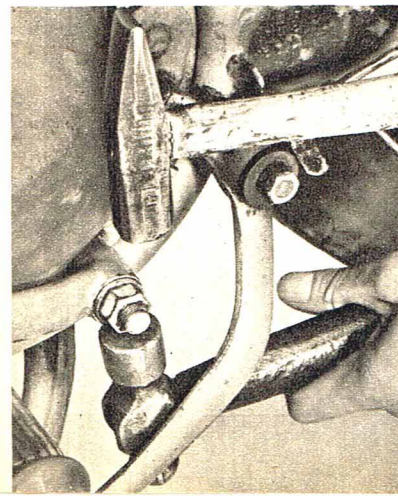
### PRECISE CHECK

An even better scheme is to support the machine with both wheels clear of the ground. Then an 8 or 9ft length of thin twine, with a weight tied to each end, is rigged close alongside at about spindle height. This is done by placing, say, a wooden box, oil drum or low chair at each end of the machine and draping the ends of the twine over them. The twine is next brought as close as possible to the wheels without foul-

ing anything such as footrests, pedals or exhaust pipes, and is very carefully adjusted at both ends until it lies absolutely parallel to the rear wheel as measured with a rule placed squarely against the side of the rim fore and aft of the spindle and brought up under the twine. Make further checks after turning the wheel through 180 degrees and then 90 degrees; if necessary a mean setting must be used. Then turn the steering until the front rim, too, is exactly parallel to the twine. If the rims are the same width, the measurement from the twine to rim should be identical back and front; if the rims differ in width make the allowance necessary.

### TIGHT THREADS

Rust can take such a hold as to beat all efforts to slacken a nut or screw by means of a spanner or screwdriver. Generally the corrosion between the mating surfaces can be broken by light jarring. The illustration shows the methods to use. A nut should be tapped laterally with one side supported (to prevent the bolt from being strained or sheared). In the case of a screw, a soft metal rod—say, of brass—can be used between the screw head and the hammer.





### LUGGAGE CARRYING

The days of string and leather straps for securing luggage have long since disappeared. Experienced riders today use aerolastics which are available in several lengths, in several diameters and with varying sizes of hook at each end. For carrying smallish shopping purchases on a tank-top luggage grid an excellent (and inexpensive scheme) is to use rubber rings, cut from an old inner tube, with picture-rail hooks fitted to their extremities for slipping over the luggage grid's rails.

### IN DEEP WATER

One of the most common misconceptions among motor cyclists is that watersplashes should be tackled fast. The general impression seems to be that every instant with one's wheels in water spells trouble! But watch a trials rider in deep water. He will ride very, very slowly so that there will be little or no bow-wave to increase the water's effective depth. Then, should the water rise above the level of the exhaust pipe outlet, the revs will be increased to counteract back pressure, but the clutch will be

slipped to keep the speed down. A recco to determine the exact depth of any suspicious splash is always worth while. You may be able to get some idea from the height to which the water comes on youngsters' Wellington boots—or by letting less cautious road users go through ahead. In any event it is advisable to keep to the crown of the road—where the water will be shallowest. Of course, in freak floods, when the water is likely to come up to the level of the carburettor the only sensible course is to push through with a dead engine. If no air filter is fitted the air intake should be lightly stuffed with that rag you always carry in the tool box. Even when the far side is reached a further precaution is necessary. Run the front wheel up a bank in order to drain any water that may be lying in the exhaust system. Water is incompressible and if the engine should kick back and water in quantity reach the cylinder serious damage can result. When crossing a

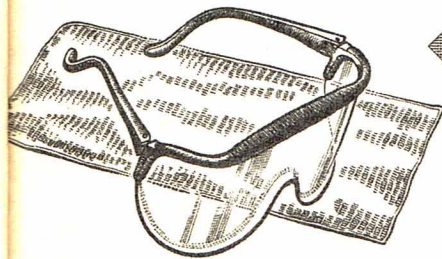
means of a grease-coated tap. The dirt sticks to the grease and so comes out as the tap is withdrawn. If no tap is available, two longitudinal saw cuts can be made in a bolt or set screw with the required thread and that used instead. The thread most commonly employed for timing-chest and primary chaincase screws is  $\frac{1}{4}$  in Whitworth.

### WARMING-UP

The best way of warming-up an engine after a cold start is by riding the machine—by giving it work to do. On no account should the power unit be left idling with the air slide or strangler in the closed position. Obviously one drives gently for the first mile or so—no high revs and no hard pulling.

### SCOOTER GOGGLES

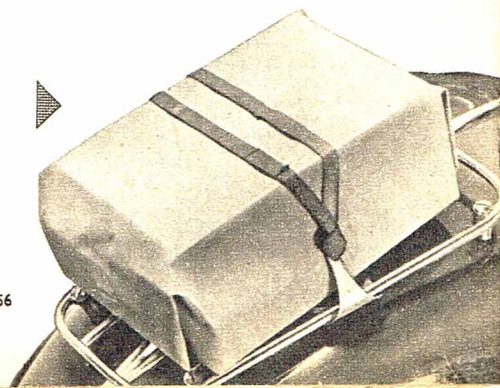
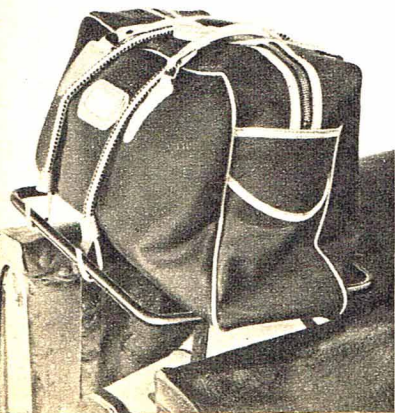
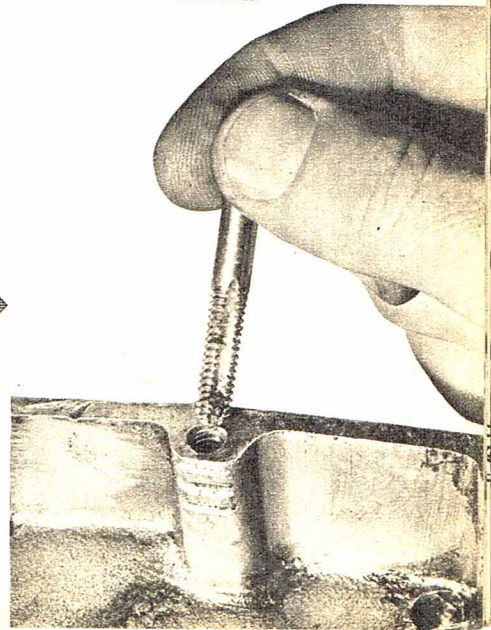
Since goggles worn behind a windscreen are in virtually still air there is a strong tendency for them to steam up in wet weather. But scooter-type goggles stand slightly away from the face and so are extremely well ventilated. Not entirely satisfactory for high-speed riding on a machine without a screen, they are well-nigh perfect for use in conjunction with a windscreen.

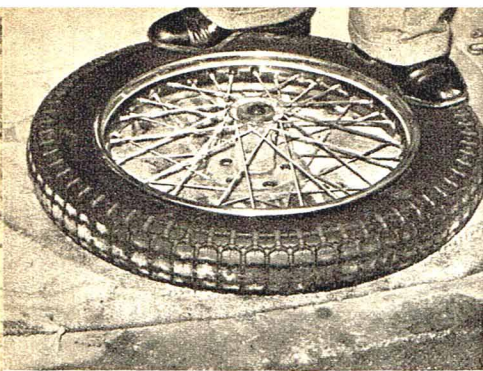


swollen river in the Scottish Six Days' Trial a few years ago a famous rider permitted his engine to inhale a cylinder-ful of water. The result was that the crankcase studs were pulled right out of their sockets.

### CLEANING BLIND HOLES

Dirt in the screw holes in a primary chaincase or timing-chest-cover joint are a frequent but unexpected cause of oil leaks. The dirt, of course, prevents the screws from being fully tightened. The best way to clean out a blind threaded hole is by





### FREEING TYRE WALLS

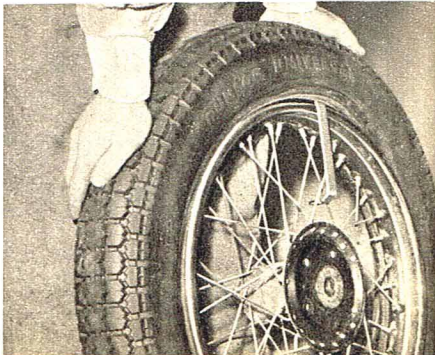
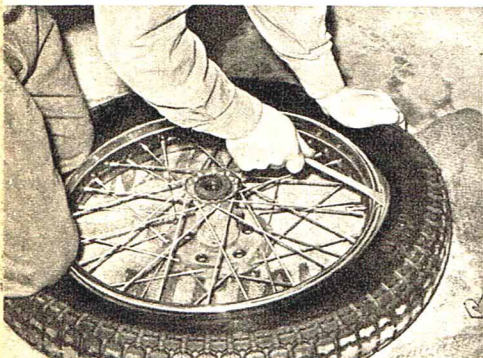
The simplest method of "unsticking" the tyre walls from the rim is first to remove the valve core, then lay the wheel on its side and "walk" round the tyre. In the case of wheels not having so-called knock-out spindles, the wheel cannot be laid flat; but a simple expedient is to place one side of the wheel on a brick topped by a piece of wood of sufficient thickness to keep the spindle clear of the ground. If no plank is available then the spindle nuts should be unscrewed so that they project over the spindle end to protect the threads.

### START AT THE VALVE

One simple basic rule governs tyre-changing technique; when the tyre is being removed the levers should first be inserted close to the valve; and when it is being replaced the cover should first be fitted into the rim at the point diametrically opposite the valve. Thus one starts at the valve and finishes at it.

### BASIC RULE No. 2

Another essential in tyre fitting is that the wired edge must be constantly worked into the rim well at a point opposite to that at which the levers are being employed. The technique is to force the edge well down by kneeling on it as the levers are used. If soapy water—not too much—is poured on the tyre wall the task will be simplified. The levers, too, may be dipped into the solution before each insertion. In no circumstances should petrol or oil be used for both have a detrimental effect on rubber.



### TYRE RIGHT OFF

How to take a tyre clean off the rim? First withdraw the inner tube. Then stand the wheel upright and place the inside of the right foot against the tyre wall. The right hand is then used to grip the spokes close to the top of the rim and, with the other hand, the tyre is pushed outward and downward with a jerky movement. If the tyre does not come off easily, transfer the right hand to the top of the rim, exert downward pressure to force the rim down into the tyre and use a lever as shown. For the initial stages in the refitting process the procedure is simply the reverse of that already outlined.

### TYRE-VALVE INSERTION

First step in refitting an inner tube is to put a little air—a very little—into the tube to prevent it from twisting. The second stage can sometimes, for beginners, be a little difficult. As the tyre wall is raised to allow the hand carrying the tube to enter between the tyre and the rim, the other edge of the tyre is pulled up, thus obscuring the valve hole in the rim. The method of restraining the lower edge is to insert a lever of the type that can be clipped over a spoke. That done, the valve hole is kept uncovered and both hands are free—one to raise the cover and the other to insert the valve.

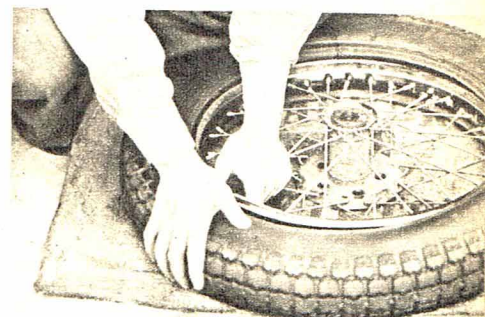
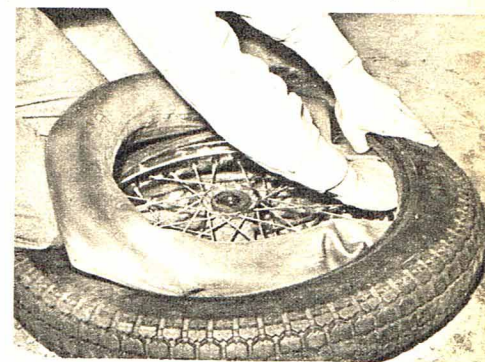
### FITTING THE COVER

As mentioned earlier, the aim in fitting a tyre to the rim is to finish at the valve. So the tyre edge is first inserted at a point diametrically opposite the valve and gradually worked into the rim well. When half the tyre's circumference is fitted resistance will begin to be felt. Levers can be used from then on but remember that if they nip the tube you will have another puncture to repair. A safer scheme is to stand on the tyre, stamping the edge down into the rim, a little at each side, pausing after each few inches have

slipped into place to ensure that as much as possible of the circumference is right down in the well.

### THE FINAL STAGE

When the tyre is inflated, the moulded line on each wall must be equidistant from the rim. If it is not, over-inflate by approximately 10 lb sq in and, grasping the wheel across its diameter raise it sideways and bring the tyre down hard on the ground at such an angle that the cover will be pulled out of the well at the point where the moulded line is closest to the rim.



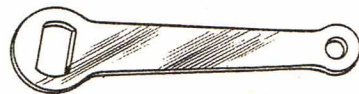
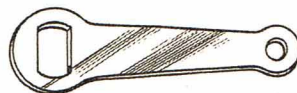


### PETROIL MIXTURE

Provided the petrol and oil in the tank of a two-stroke motor cycle or scooter are thoroughly mixed they will never separate. Hence, if a machine is left standing for a period of weeks or even months, there is no need to rock the machine to re-mix them.

### SIMPLE COMPENSATION

On some machines the square or D-slot in the brake cam lever is so positioned that the lever can be removed and fitted the other way round so that the best possible leverage may still be obtained even after the brake linings are considerably worn. Alternative cam levers are available for some models.

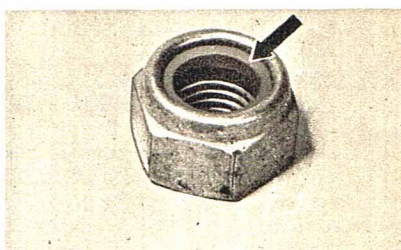
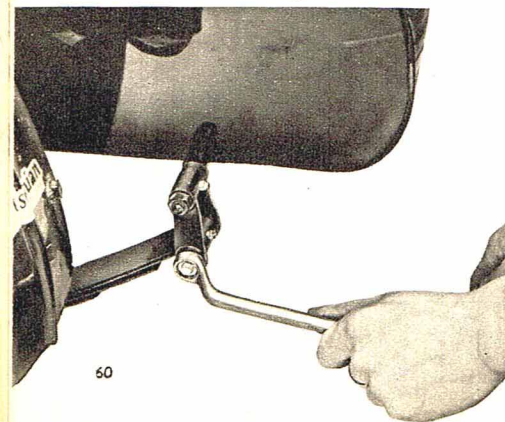


### DRIVING OUT A COTTER PIN

In nine cases out of ten a cotter pin must be jarred initially to free it on its taper seating. If the thread is not to be damaged the nut should be slackened until it stands just proud of the male thread. There is thus no danger in "rivetting over" the end of the pin.

### SIDECAR-BODY DETACHMENT

It is often easier to remove a sidecar body complete with its rear bearer bar and shackles by withdrawing two lubricated shackle pins rather than disturb the (possibly rusted) carriage bolts securing the body to the bearer bar.



### SELF-LOCKING NUTS

A point to remember about self-locking nuts with fibre centres is that after the nuts have been fitted and removed many times the fibre deteriorates. The nut then ceases to be self-locking and should be replaced.

### KNACK—NOT FORCE

Not all big machines have lifting handles and not all those which have are easy to raise on to their centre stands. In nine cases out of ten the plot is to stand on the left and lower the stand with the left foot, steadying the machine with the left hand on the handlebar and the right hand grasping the lifting handle or a convenient mudguard stay. When the stand is lowered, the left hand is transferred to the left footrest which is then given a quick rearward and upward heave.

### CRACKED BATTERY

If your battery should develop a flaw in the case a simple repair can be made by using pitch taken from an old torch battery. The pitch can be melted into the crack by means of a hot poker or a soldering iron. This scheme does not, of course, apply to batteries with polystyrene cases.

### POSTCARD TIP

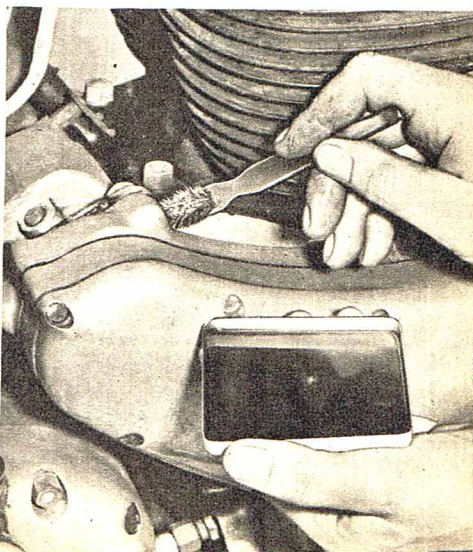
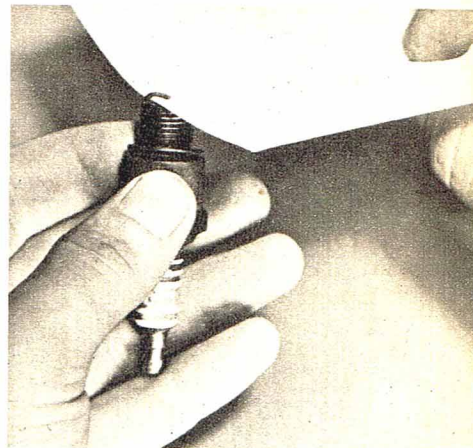
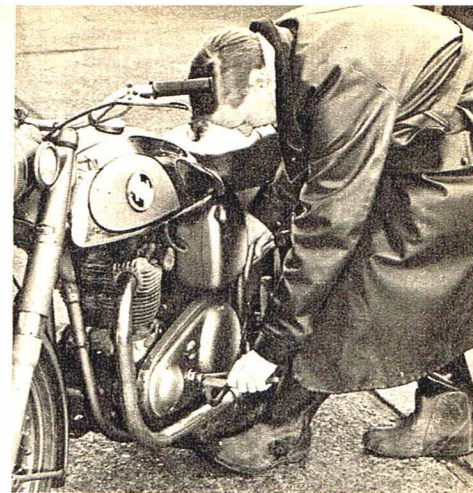
It is worth remembering, should you have mislaid your feeler gauges, that a postcard makes a suitable gauge for checking the gaps of some sparking plugs. The thickness is between 0.015 and 0.020in.

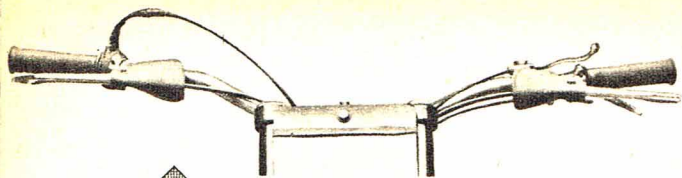
### PROTECTING TOOLS

Stored in a tool box—or even in a garage—rarely used tools inevitably deteriorate in winter. Nail varnish let down with thinners and applied with a brush provides an excellent protective shield. The same dodge, of course, can be used to safeguard spare valves and other components stored on a garage shelf awaiting future use.

### FOR NOOKS AND CRANNIES

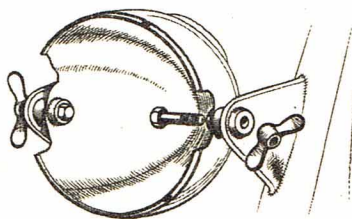
Difficult-to-clean nooks and crannies on an engine or gear box can often be cleaned by means of an old tooth brush dipped in paraffin or some other grime remover.





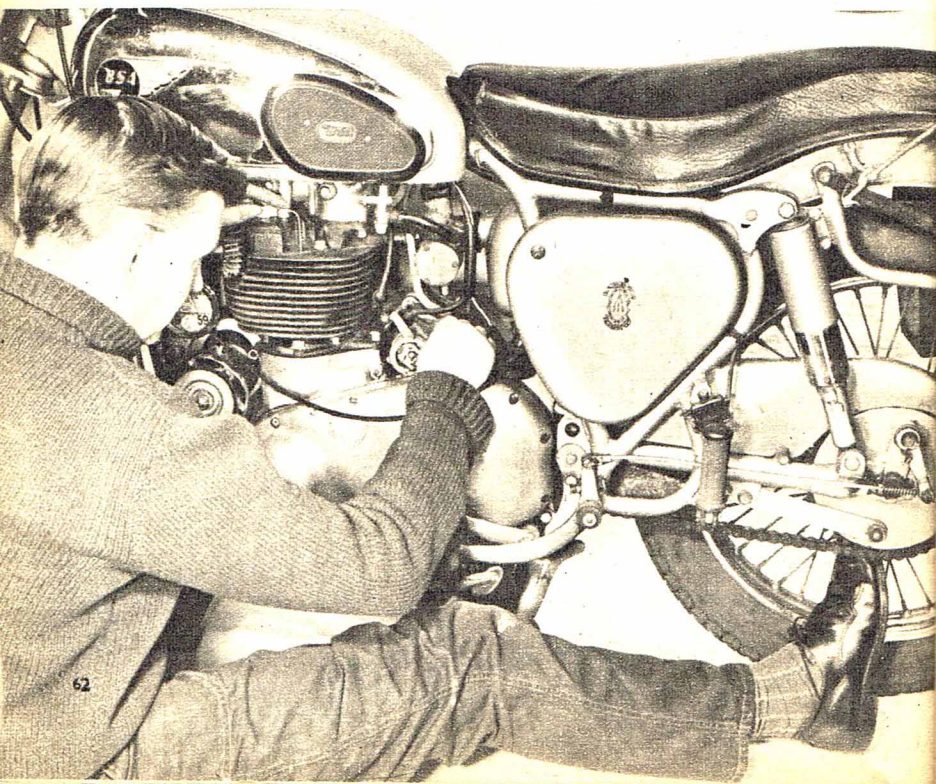
### HANDLEBAR SETTING

Perfect comfort and control can be achieved only if a machine is "tailored" to suit the rider. Even with a scooter, on which seat and footboard positions are fixed, a great deal can be done by experimenting with various angles of the handlebar grips. Generally speaking, the aim should be to set the handlebar so that the grips lie in an approximately horizontal plane. Clutch and front-brake levers should be brought as close as possible to the grips with the tips of the levers slightly lower than the ends of the handlebar. The greatest degree of lightness and smoothness of throttle action can be obtained only if the twistgrip setting allows the cable a run that is free from sharp bends. All control cables, of course, should run in easy sweeps.



### BEAM ADJUSTMENT

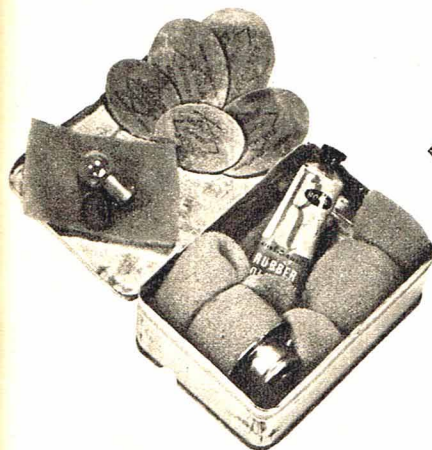
In these days of long-movement suspension systems, the headlamp beam setting has to be lowered when a pillion passenger is carried—and, of course, raised again when the passenger dismounts. A ready means of adjustment can be obtained if the headlamp mounting bolts are removed and bolts of slightly smaller



diameter—just small enough to clear the threads in the lamp bosses—are substituted. The replacement bolts are fitted from the inside and wing nuts (preferably chromium plated or properly enamelled) employed on the outside. The setting can thus be varied in a few seconds and without the use of tools.

### LINING OVERBOOTS

Additional ankle warmth in winter can be obtained by tucking a folded newspaper sheet inside overboots in the manner shown.



The plug insulator may be cracked and, in time, the business end of the plug is certain to corrode. One need hardly mention what is likely to happen to bulbs! What a member of *The Motor Cycle* staff does is this: bulbs and spare plug are wrapped separately in synthetic foam-rubber sheeting held in place by elastic bands; they are carried in a puncture repair outfit tin measuring 4×3×1½ in. The repair kit is reduced to a wire brush, rubber solution and a few patches and the whole packed so that the bulbs are held securely. How to carry a tin like that? In a brief case, a pocket or haversack depending on the type of journey.

### A THIRD "HAND"

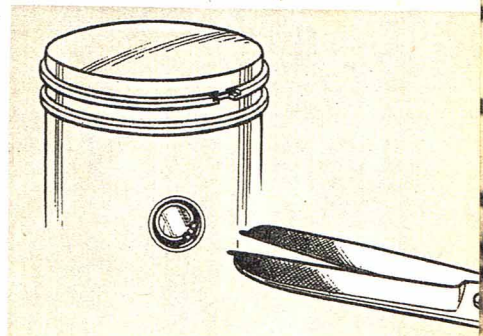
When a contact-breaker is located on the drive side of a machine, the engine cannot be conveniently turned by means of the kick-starter when the ignition timing is being checked or set. So top gear is engaged and the engine rotated by means of the rear wheel. The scheme is to sit down in such a position that the contact breaker can be easily seen, and to hook the toe of the right shoe between a pair of spokes. Both hands are thus free for other jobs.

### PACKING BULBS

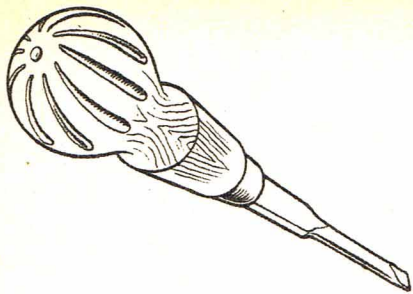
Sparking plugs and bulbs carried in the tool box are liable to damage even if they are wrapped in rag.

### CIRCLIP PLIERS

A pair of old scissors with their ends ground as shown in the accompanying sketch can make an excellent (and inexpensive) tool for removing "eye-end" circlips.







### HANDLE GROOVES

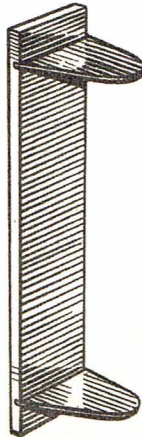
Additional grip can be obtained on the wooden handle of a screwdriver if longitudinal grooves are burnt in it as shown in the drawing.

### STRAIGHT-LINE BRAKING

Have you ever heard a racing man use the phrase: "On to the depot?" He will have been referring to the straight-line braking technique adopted when a corner is approached too fast—when the braking has been left until too late. Imagine that a right-hand turn lies ahead, with no "escape" route. The emergency technique is to delay the entry into the corner and to head straight on, keeping the machine more or less upright and applying the maximum possible braking. By the time the gutter at the apex of the corner is reached the speed has been reduced and in all probability the turn can then be negotiated in safety.

### SPECIAL FEELER GAUGES

Orthodox feeler gauges cannot always be used in confined spaces. The drawing shows how the problem was tackled by a reader of *The Motor Cycle*. Blades of the appropriate thicknesses were taken from an old set of feelers and ground as illustrated. These were then fitted into carefully cut grooves in a short length of  $\frac{1}{4}$  in mild-steel strip.

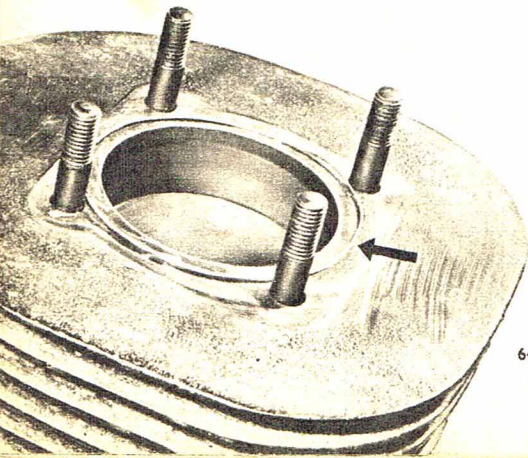


### USING CAUSTIC SODA

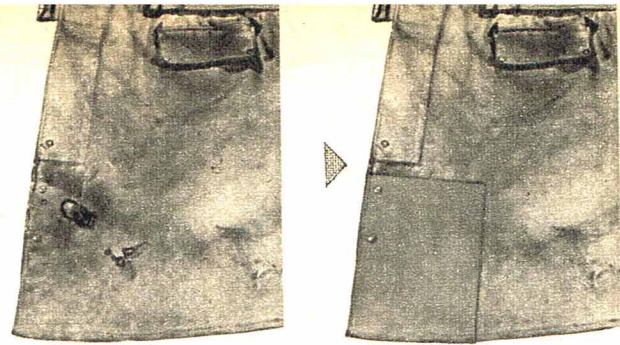
We have all heard that caustic soda can be employed for removing carbon. Used in a proportion of approximately 3 lb to a gallon of water it lifts carbon, dirt, grease as though by the wave of a wand. But certain precautions are necessary. Caustic soda must be used on cast-iron and steel components only—never on light alloy. After removal from the solution the parts must be washed immediately and thoroughly in clean water and, if to be left for any length of time, smeared with oil or grease to prevent rust from forming. Finally, the solution should be kept away from the skin and, as the fumes affect the eyes, one should use it in the open.

### WIRE TO THE RESCUE

Copper wire has a hundred and one uses. For instance, if a cylinder-head gasket should blow, a ring of heavy-gauge copper wire fitted round the cylinder-barrel spigot and clamped down by the head should provide a seal sufficiently good to get you home.



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### PATCHING A COAT

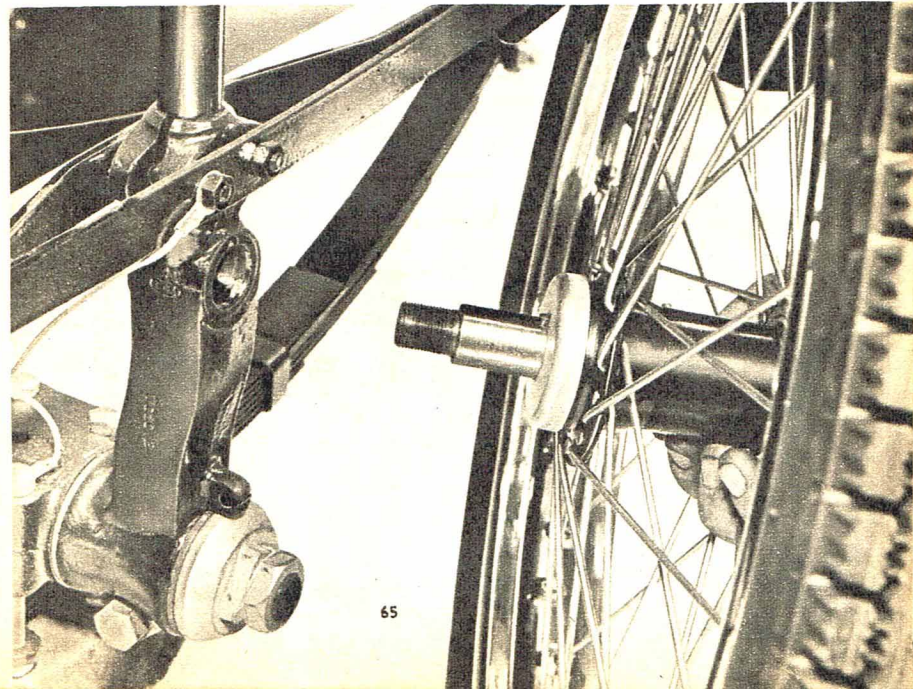
Double-texture coats, after long service, mostly wear through near the bottom of the skirt, where the material is in contact with the tank knee grips (and even with the cylinder head if the skirt is generous and not equipped with some means of fastening it round the rider's legs). Satisfactory patching is not difficult if thin leather sheeting is used and attached very much in the way that your wife or mother attaches elbow and cuff leather to your old sports jackets. With a little care a neat, professional air can be imparted to the repair, to the extent, even, that the patch appears to be part of the original design.

### INTERIOR CLEANING

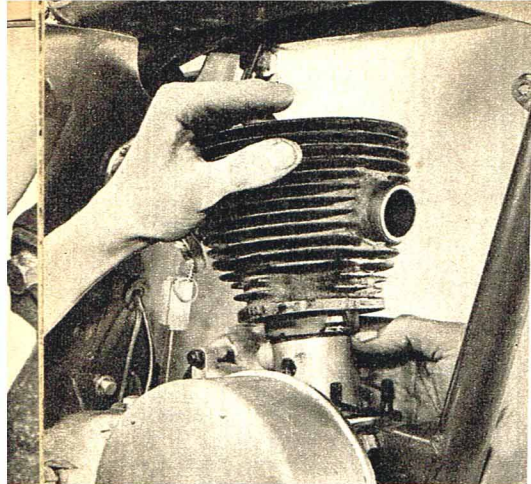
Sidecar bodies or canopies covered with leathercloth should be cleaned by being washed with warm soapy water or with a solution containing any of the normal household detergents. After the leathercloth has dried, polish it with white boot polish. If a small brush is used, excellent results can be achieved.

### THAT SIDECAR WHEEL

When removing a sidecar wheel, many enthusiasts dismantle the hub. An easier method in some cases is to unscrew the nut securing the stub axle to the pivoted arm or chassis tube and then remove the wheel and axle together.



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### LOWERING A CYLINDER

When the cylinder of a two-stroke engine is being slipped over the piston it must be lowered straight down, without being turned in any way. If it is lowered with a twisting movement the ends of the piston rings may become trapped in one of the ports and so be broken.

### GETTING YOUR PASSPORT

A passport is the first essential in the preparations for one's first holiday abroad. It costs £1 10s, is valid for five years and is available from passport offices in London, Glasgow and Liverpool, or through local labour exchanges or travel bureaux. Application forms are available by post or personal application. Your application must be signed by an M.P., a J.P., a minister of religion, a medical or legal practitioner, a public official



or any person of similar standing who has been personally acquainted with you for at least two years. When the form is returned it must be accompanied by two photographs of the applicant (full face and no hat) measuring  $2\frac{1}{2} \times 2$ in or not less than  $2 \times 1\frac{1}{2}$ in and his or her birth certificate. When a joint passport is wanted for husband and wife, the wife's marriage certificate and, of course, two photographs of her also, are required. Passport office addresses are as follows: *London*, Clive House, Petty France, S.W.1; *Glasgow*, 14, Blythswood Square, C.2; *Liverpool*, 5th Floor, India Buildings, Water Street.



### STITCHING PRESERVATIVE

Leather riding boots can be kept supple and waterproof if they are given regular applications of boot polish. But it is not always the leather that proves troublesome: it is generally the stitching that gives up first. Dubbin is one of several preparations that will prevent stitching from rotting. Rubbed in with an old toothbrush and left to soak in, it will effectively lengthen the boots' life.

### GLOVES, TOO

Proprietary preparations with dubbin-like qualities are less messy to use and hence more useful for applying to gloves. The best way to rub the liquid well in is to pull the gloves on, pour a little into one of the palms and then wring the hands together as though washing them. By the way, preparations of that ilk are equally useful on the harness of a helmet.

### STRIPPED THREAD

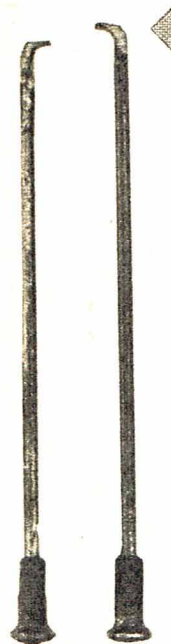
Should a bolt thread be stripped through overtightening, a temporary repair can be made by placing two additional washers behind the nut so that it bites on unstripped thread. Yet another scheme where the bolt is long enough is to fit a second nut—a locknut—hard up to the first.

### SLACKENING A UNION

When loosening a petrol-pipe gland nut from the tap make sure the tap does not unscrew by holding its hexagon with a second spanner. A similar scheme should be used for oil-tank unions.

### REMOVING CLUTCH PLATES

When clutch plates are reluctant to leave the drum—because they are sticky or perhaps owing to irregular wear on the tongues and grooves—withdrawal tools can be made from old spokes as shown. The heads of the spokes are ground down until they form very small hooks. The



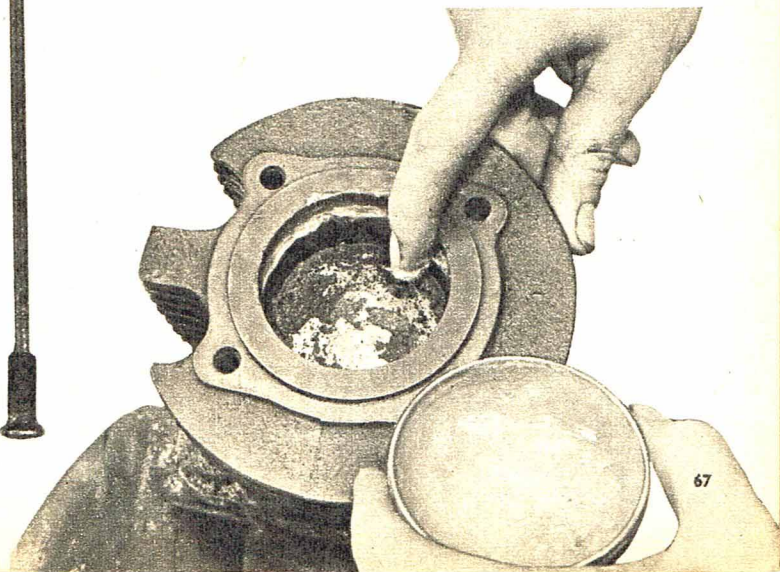
hooked ends are slipped between the clutch drum and driven plates or between the clutch centre and driving plates as necessary.

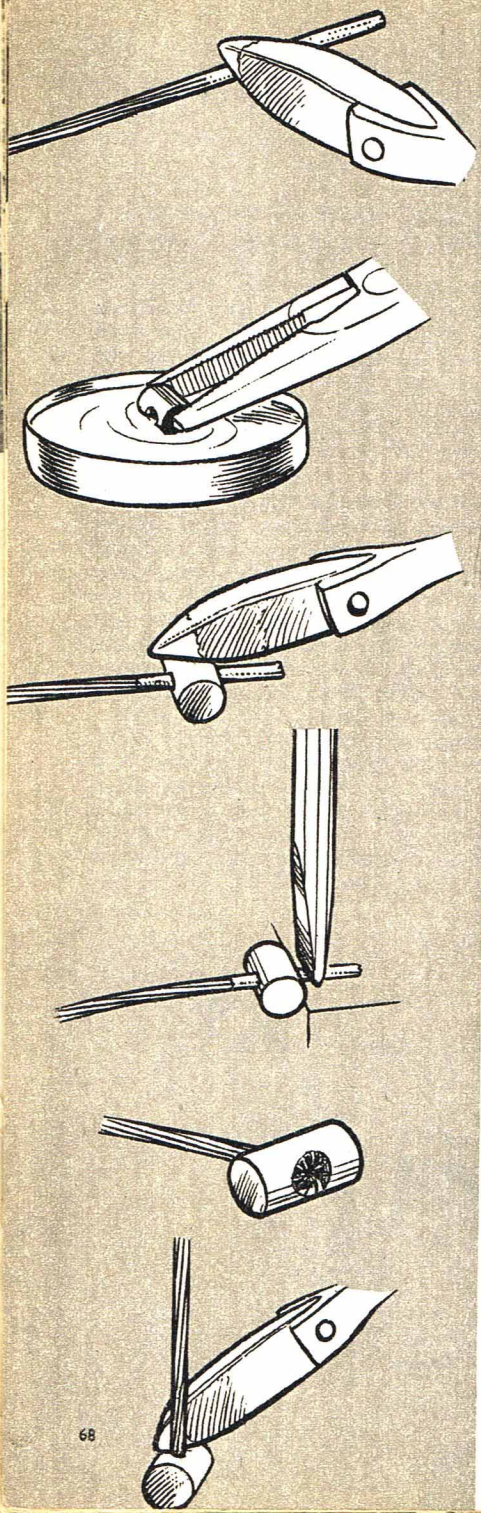
### STEERING-HEAD ASSEMBLY

When refitting steering-head bearings it is a good plan to fill the bottom race with grease, put the steel balls in position then wrap around the outside a length of cellulose tape. That done, there is little likelihood of the odd ball dropping out while the steering stem is being inserted through the head. The tape is easily stripped away afterwards.

### TRAPPING CARBON

After decarbonizing your engine without disturbing the cylinder barrel, it is usually difficult to recover particles of carbon that fall into the gap between the top of the piston and the cylinder bore. So before starting to clean up the piston crown, move the piston about half an inch down from top dead centre and apply a smear of grease round the top of the cylinder bore. The next step is to move the piston back to t.d.c., decarbonize it and then to lower the piston so that the grease, together with the particles of carbon embedded in it, can be wiped off.





### SOLDERING TECHNIQUE

The accompanying drawings illustrate the stages of soldering a barrel-type nipple to a control cable. The first sketch shows the cable being given a thin coating of solder—being tinned. This is done by first dipping the cable in flux then rubbing it over with a hot, tinned soldering iron half an inch or so from the end. If the cable has been in use for some time and there is oil or dirt between the strands then it must be washed out thoroughly in petrol until it is absolutely clean.

The second illustration shows the nipple being dipped into a bath of flux preparatory to its being slipped over the cable. The hot iron is then held against the nipple (not, note, against the wire), until the heat is conducted through and the solder begins to melt. When the nipple is in position the wire is then cut by means of a small cold chisel or by using the edge of a file. The next step is to splay out the  $\frac{1}{16}$  in of cable protruding into the countersink provided in the nipple. Finally, solder is run through the nipple in the manner shown in the last sketch until the countersink is completely filled.

### FITTING A UNION

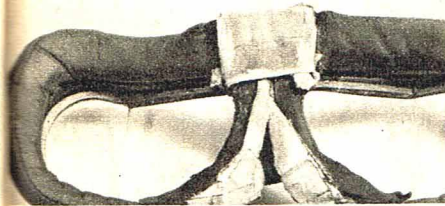
First of the similar sketches on the next page show a petrol pipe being cleaned with a strip of emery cloth and, in the second, being tinned. In the third drawing the emery strip has been rolled so that the oxidization film can be removed from



the nipple bore. Next, heat is applied to the nipple by means of the soldering iron while a stick of solder is rubbed lightly over the inner walls. Finally, pipe and nipple are joined together *after the nut has been slipped over the pipe*. Useful pointers not illustrated are that a damped rag, wiped quickly over a tinned cable or petrol pipe while the solder is molten will take off all the surplus so that the nipple can be easily slipped on cable or pipe as the case may be.

### SEALING GOGGLES

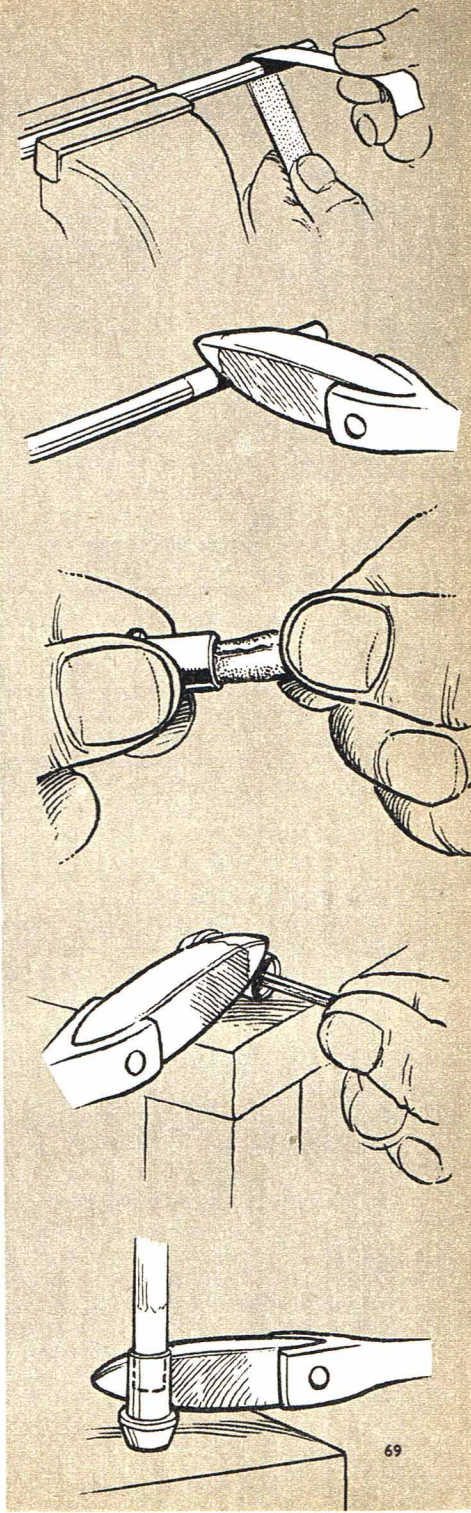
When the stitching of R.A.F.-style goggles deteriorates between the face piece and metal frames, draughts are inevitable. Generally the stitching rots first where there is tension—at the sides of the nose bridge. A satisfactory draught seal can be made—



and the tension on the remaining stitching relieved—if adhesive patching tape of the type applied by means of a warm iron is stuck between the nose bridge and the eye-piece surrounds. Additional draughts between the eye-pieces and their metal frames can be stopped satisfactorily by sealing with balsa cement.

### KEEPING A CREASE

For those who wear waders (or over-trousers and overboots) an excellent scheme before they are donned is to fold the trousers close round the legs, maintaining the crease, and then fit trouser clips. The clips should be of "side" pattern rather than circular, since the latter type can prove tight and uncomfortable on a long run.





### CAMERA PROTECTION

A camera should never be carried slung over one shoulder and outside one's riding jacket where it is exposed to rain. The technique is to carry it inside one's coat, snug against the tummy and with the strap over one's neck. In this way the camera is kept dry and, at the same time, is ready for use in an instant. Do not, by the way, carry a camera in a pannier: jolting can easily damage the shutter mechanism.

### POLYTHENE OVERMITTS

Inexpensive and very light waterproof overmitts can be fashioned from polythene sheet. The gauntlets are used as templates and four polythene patterns cut, making due allowance for the thickness of the gloves and for seams. The two halves of each overmitt are welded by running a hot iron along the edges of the material.

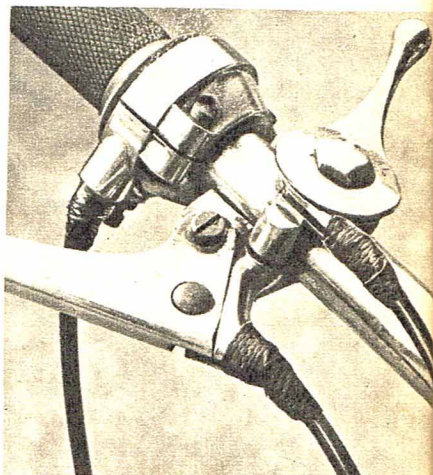
### HARD AND SOFT PLUGS

When a sparking plug runs too hot it will cause pre-ignition or detonation. On the other hand, if it runs too cool it may oil up or at least require frequent cleaning owing to the formation of carbon and other deposits on the insulator and electrodes. To suit various designs of engine with one

type of plug is not possible because of the wide range of engine internal temperatures. So the construction of plugs is varied to suit different types of power unit. Hence the terms hard and soft relative to plugs. A hard plug is one of great heat resistance and is therefore designed for use in high-performance engines. A soft plug has less resistance to heat but greater resistance to oil and is intended for use in engines developing (capacity for capacity) rather less power.

### PROOFING CABLES

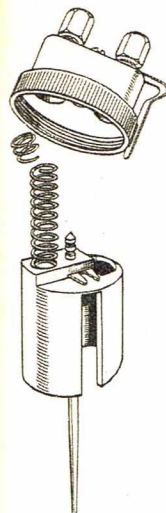
Adequate lubrication is the first line of defence against the entry of water into control cables. But in wet weather tape should be used to keep moisture out of adjusters and to proof the ferrules at the ends of casings.



Examine casings for tears and abrasions. A few turns of insulating tape will make a sound repair provided the metal armour is undamaged.

### LIGHT THROTTLE

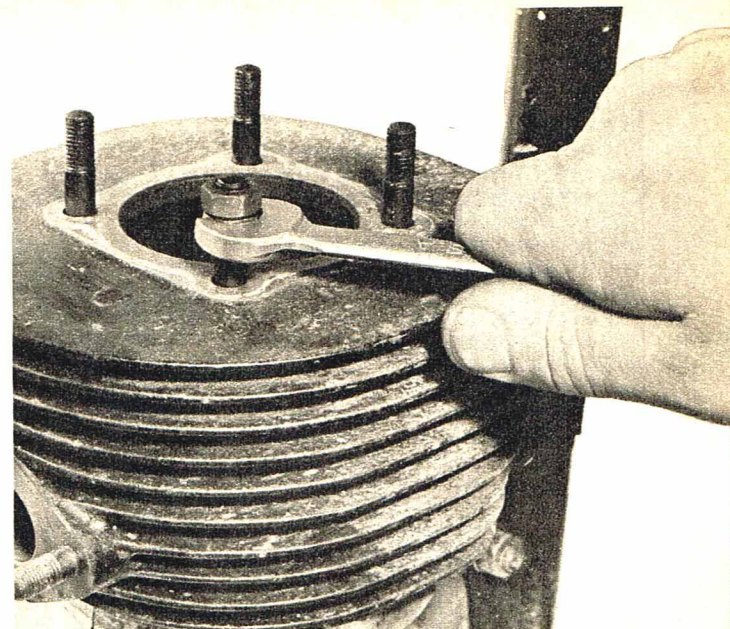
A throttle return spring may be so strong that it snaps the throttle shut the instant the twistgrip is released;



attempts to counter the effect with the twistgrip friction adjuster can make the grip extremely heavy in operation. When this happens the spring can be shortened by cutting it with a pair of tinsnips but care is needed to ensure that no more coils than strictly necessary are removed. The spring should be shortened by one coil at a time, the carburettor reassembled and the throttle action tried. If too many coils are removed the throttle slide will be sluggish in closing and, indeed, may refuse to close against even the slight friction imposed by a well-lubricated cable. The same treatment will cure a throttle spring that is coil-bound and preventing the throttle from opening fully.

### TANK LEFT IN PLACE

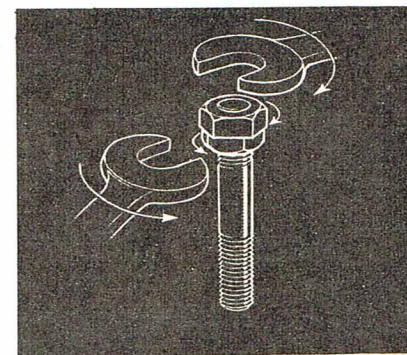
When the cylinder barrel of a two-stroke is being raised the task can generally be done without disturbing the fuel tank. This is possible even when the cylinder and head are held to the crankcase by long studs passing through the cylinder casting. The scheme is to withdraw the studs—in many cases only the rear pair need



be unscrewed. That done, the cylinder can be raised clear of the piston, tilted forward and lifted away.

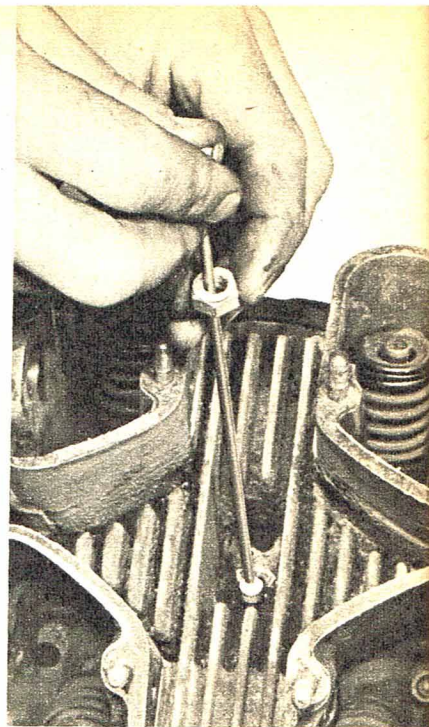
### TURNING STUDS

The adjacent drawing shows a method of tightening (or unscrewing) a plain stud. Two nuts are screwed on and locked together with two spanners. By this means the stud is temporarily transformed into a bolt. One turns the lower nut for unscrewing the stud and the upper nut for tightening it.



### THREE-IN-ONE COATS

Because of the injurious chemical reaction that takes place when specially impregnated linings are subjected to modern dry-cleaning processes, some three-in-one coats carry a tag emphasizing that surface cleaning should consist of no more than a fairly gentle application of soap and water. But even if your coat is supplied with no such advice you should not have it dry cleaned without first consulting the makers. Even the normal drying process for good-quality riding coats demands care. The coat should be hung up, on a coat hanger if possible, and dried slowly. Excessive heat should be avoided at all costs. In other words, don't drape the coat over a kitchen chair and push it up close to the stove. In hot summer weather, when a three-in-one coat may not be required, do not hang it on a nail in the garage wall or carry it stuffed in, say, a sidecar boot. Hang it instead in a cool, dry cupboard.



### INACCESSIBLE NUT GUIDE

When a cylinder-head nut is shrouded by, for example, deep finning, replacing it on its stud can appear to be well-nigh impossible. There may be insufficient room for one's fingers. The answer is to place the lower end of an old spoke on the head of the stud and slide the nut down the spoke. The nut falls into position and, while it is still held there by the spoke, can be twirled down the first few threads with a hacksaw blade or steel rule inserted between the fins.

### TRANSFERRING PETROL

In the early days of motor cycling, petrol was transferred to a machine which had run out from another by means of a bulb horn. Today it is as well to remember that the majority of two-strokes fuel-tank filler caps incorporate an oil measure. . . . In an emergency a safety helmet can be used. Perhaps the greatest safeguard of all is to carry a polythene bag folded up in a riding-coat pocket.

### TYRE LEVERS

The picture shows a selection of tyre levers of recommended design. Those on the left are the type most commonly employed by International Six Days' Trial riders; they are 14in long and can be bought—or made by a local blacksmith—for a few shillings. Those on the right are of basically similar design but double ended, with a slight difference in spoon angle at each end. That in the middle is designed for clipping to a spoke and so leaving both hands free while holding part of the edge of the tyre out of the rim.

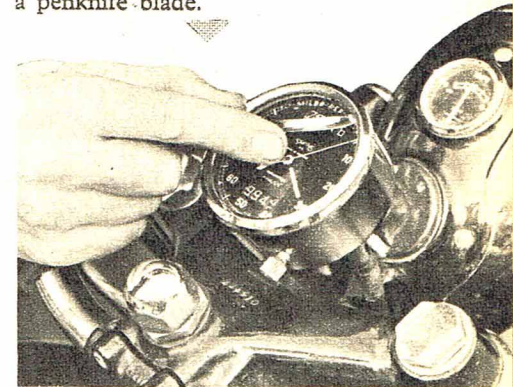


### WHEEL BALANCING

Front-fork flutter at speeds of over 50 m.p.h. can often be attributed to the wheel being badly out of balance. Two methods of achieving true balance are illustrated. First raise the front wheel clear of the ground and make sure that the brake is not binding. The wheel is then spun slowly and allowed to come to rest. Mark the spoke which is at the top and repeat the process a few times to ensure consistency. Then attach a collar or length of lead strip to the marked spoke and recheck. The weight of the attachment should then be increased or decreased until the wheel comes to rest at a different position each time it is spun. If lead strip is used, due allowance must be made for a turn or two of insulating tape to bind the lead in place. Finally the tape should be coated with shellac or balsa cement.

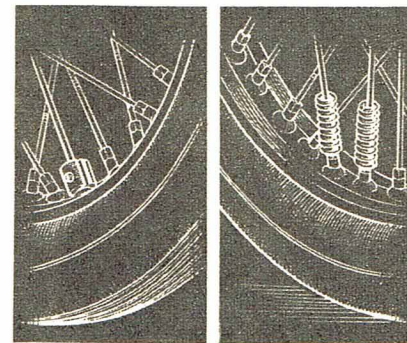
### LEAKING SPEEDO GLASS

Water seeping through between the speedometer or ammeter glass and its rim is a trouble experienced on many elderly models. The rubber sealing ring has perished—hence the trouble. A simple cure is to take a little Plasticine and force it into the joint with a penknife blade.



### “PUMPING” THE BRAKES

When wheelgrip is lacking trials riders employ a technique known as “pumping the brakes.” They ease the brake on and off, adding pressure as seems necessary, alternately applying the brake and letting it off. Hence, if the wheel should lock, the brake is released a fraction of a second later and a skid would not develop. This tip is invaluable on any road which is coated with mud or slime, and especially where there is snow or ice.

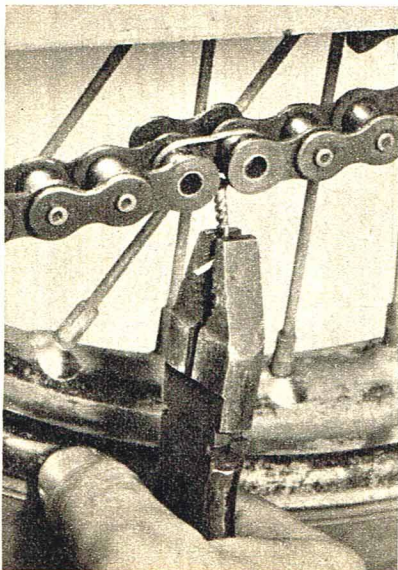


## REPROOFING

Rubberized twill and double-texture riding coats need not be scrapped when they start to let water through. A member of *The Motor Cycle* staff "reclaimed" such a coat by treating it with a fabric proofing compound of the type marketed for use on car and sidecar hoods. Care is necessary to ensure that the coat is free from oil and grease stains and that the fluid employed will allow the coat to retain a high degree of flex: that the material will not become stiff and crack where folds occur in the region of the arms and tummy. It may therefore be necessary to dilute the preparation with approximately an equal volume of turps substitute before brushing it on.

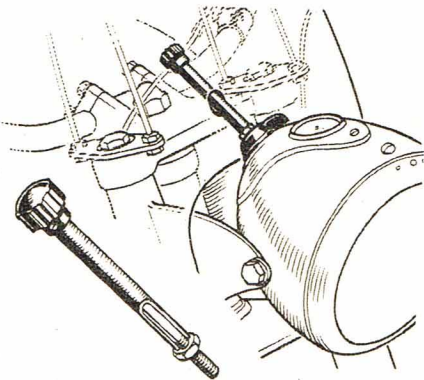
## CONNECTING THE CHAIN

It is sometimes difficult to bring the ends of a chain together for insertion of the connecting link. Perhaps the simplest method is to loop a length of wire round the rollers of the end links and use it as a tourniquet by twisting the wire ends together with pliers. An alternative scheme is to use a strong spring with the hooks large enough to fit over the rollers. Either dodge leaves both hands free for inserting the connecting link.



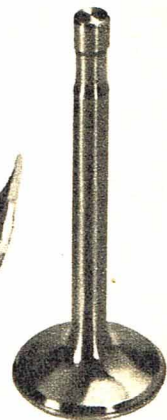
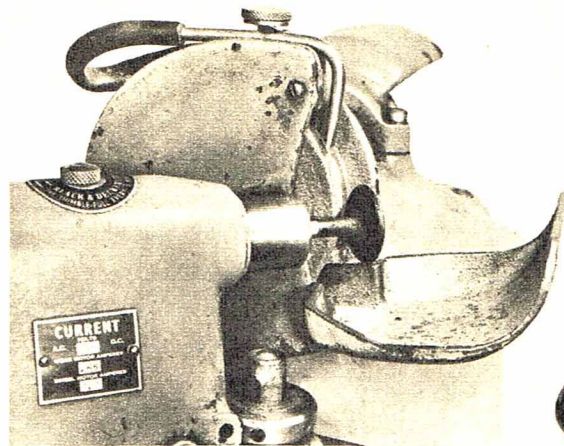
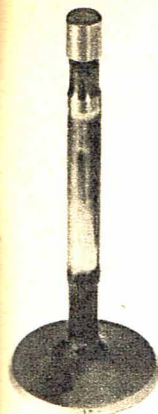
## REACHING THE SWITCH

Some handlebar screens, notably those with side extensions for providing protection for the hands, make for difficulty in operating the headlamp switch. The problem can be overcome if the switch-knob securing screw is removed and a length of 2BA rod substituted. The rod is locked to the knob by means of a nut and should be sufficiently long to pass through a hole drilled at the appropriate point through the screen. A plastic knob attached to the end projecting behind the screen completes the job.



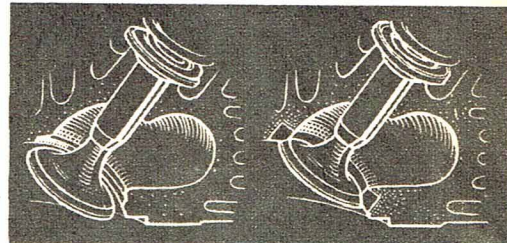
## FRESH GREASE

Do you keep a grease gun at the ready in the garage? If so, do you prevent dust from settling on the business end? A cap can be made from a short length of brass tube that slips over the nozzle, with a disc soldered into one end and the sides gently dimpled by means of an old centre punch that has lost its point. The depressions thus formed prevent the tube from falling off. If there is no cap, before the gun is used it is best to operate the pump once or twice and wipe away the grease that exudes to ensure that only fresh, clean grease is forced into the nipple. The nipples, too, should always be wiped clean before the gun is applied.



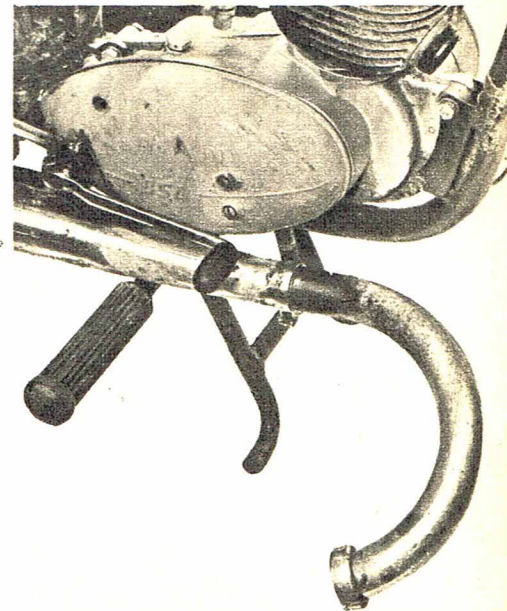
## VALVE RECOVERY

Valves that are badly pitted, or badly "ringed" by excessive grinding, need not necessarily be discarded. The seats can generally be recut in a valve-grinding machine at a garage for the cost of a shilling or two.



## POCKETED VALVE SEATS

Many of those flat exhausts we hear are the result of the valve seats being pocketed—of their having become recessed into the cylinder head as a result of excessive grinding-in. The drawing on the left shows a seat badly pocketed. Where cast-iron cylinder heads are concerned the seats can be built up by welding and new faces recut. In the case of light-alloy heads the only complete cure is to have new seats fitted.



## EXHAUST-PIPE REMOVAL?

Generally speaking, one of the first steps in engine dismantling is to remove the exhaust pipe to get it out of the way. But an exhaust pipe is difficult to stow and its finish is liable to damage when it is off the machine. In factory service departments the pipe, whenever possible, is left on the machine and merely turned down out of the way, as shown in the illustration.

## PLASTIC SUIT REPAIRS

Because damage to a plastic suit may look serious, there is no reason to throw it away. Some manufacturers provide a vulcanizing service, and plastic sheeting and cement are available from clothing stores for a few shillings. All that is necessary in order to apply a patch is to clean the surface to be repaired with petrol, cut the material and round off the corners, then smear the cement both on the patch and the garment. The separate items should then be left for ten minutes to become tacky, when the patch can be stuck down firmly with a cold household iron. Finally the garment should be laid aside for a day or so to give the patch a chance.

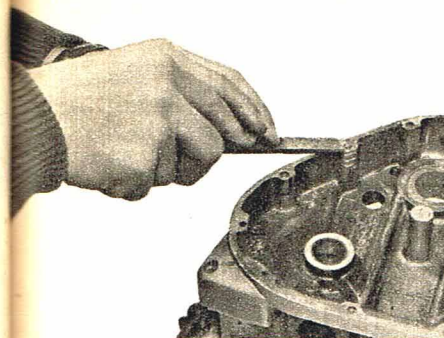
## REGULAR CLEANING

Cleaning serves to do more than merely keep a motor cycle or scooter clean. It also brings to light loose nuts and bolts. For cleaning oily engine parts there are many pro-

prietary oil solvents which, washed off afterwards with water, bring up components looking like new. The scooter enthusiast in the picture is using a paraffin bath and a brush—another excellent method.

## BROKEN FLOAT CLIP

Did you know that the groove in Amal carburettor float needles (non-pivoted float instruments) for locating the float clip is approximately the width of a woman's hair grip? Should a clip break such a grip, suitably shortened, will get you home.



## FILES INTO SCRAPERS

Excellent scrapers for cleaning up joint faces can be made from old files. The tip of the file is ground to a chisel-like edge but, of course, it is necessary to ensure that the edge is straight. If it is at all curved it will tend to dig in and so, perhaps, ruin the machined surface of a light alloy component.

## OILING CONTROL CABLES

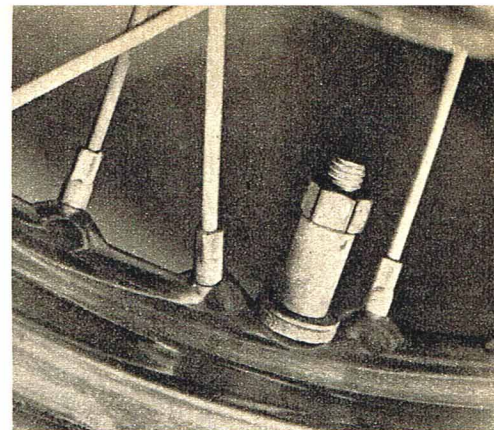
When a control cable has to be lubricated *in situ*, one scheme for forcing the oil through between the cable and its outer casing is to use a toy balloon, part-filled with oil and with the neck slipped over the cable and gripped round the casing with cord or wire. The balloon can then be employed as a pump. Alternatively, of course, an oil can of pressure type may be connected to the cable by means of a length of rubber tubing of appropriate diameter.

## HIDDEN TIMING MARK

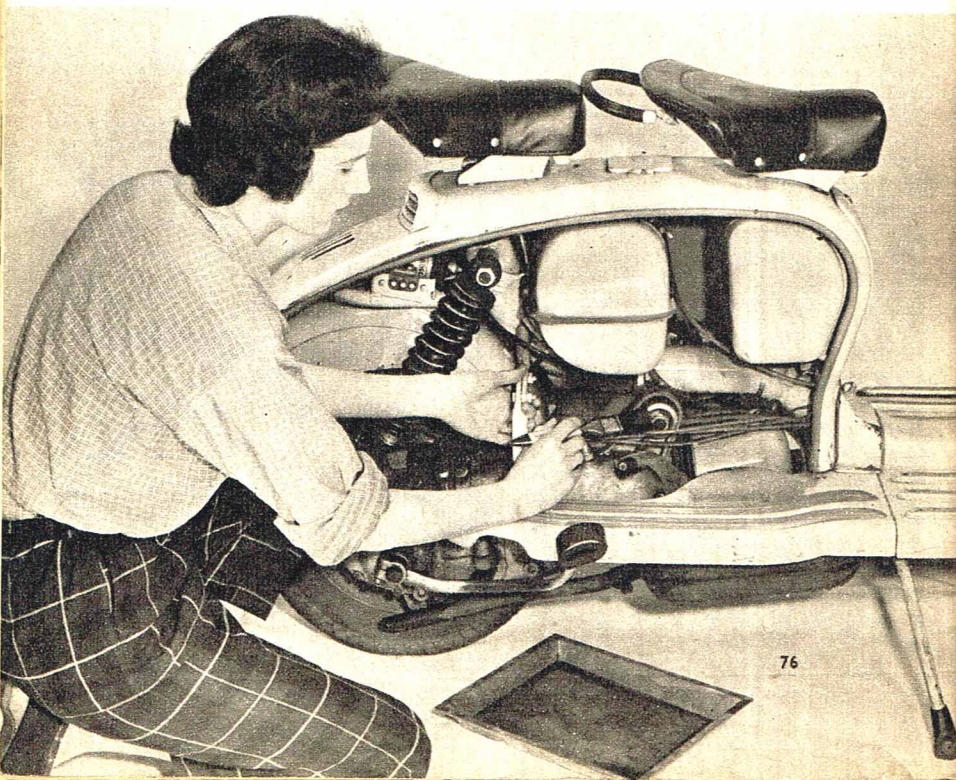
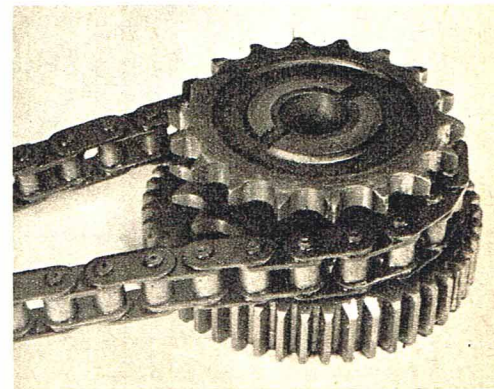
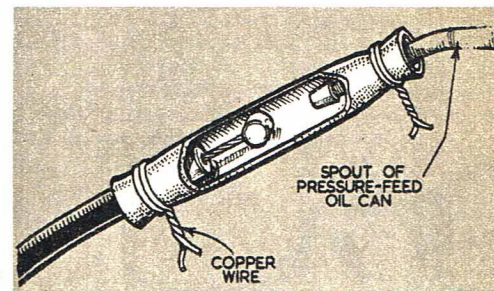
In some engines where the magneto chain sprocket is formed integrally with a camshaft pinion, the timing mark on the pinion is obscured when the chain is in position. A scheme is to mark the pinion tooth or teeth below the timing dot with chalk so that the marks are visible clear of the chain.

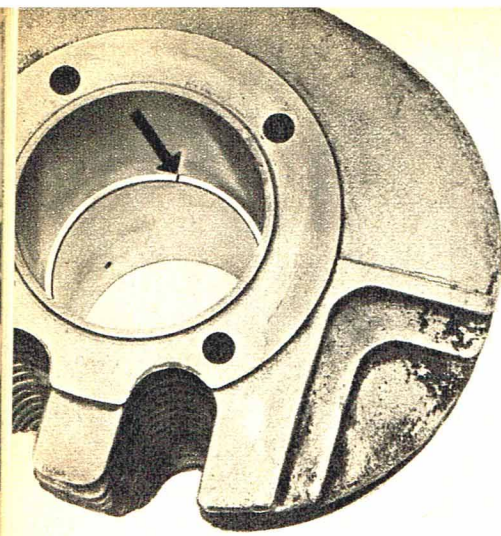
## SECURITY-BOLT LOGIC

When a security bolt is fitted to a



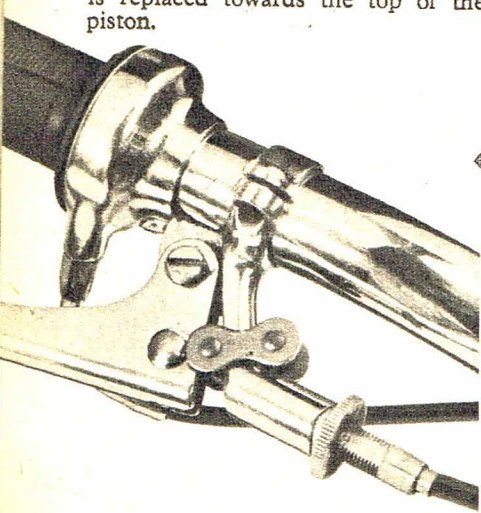
tyre it is a wise plan to interpose a light-alloy tube between the nut and the rim. By this means there are fewer threads to be undone when a tyre is being changed, rust is prevented from forming on the bolt and, of course, the appearance is improved. Only a light-alloy tube should be used so that the wheel balance is disturbed as little as possible.





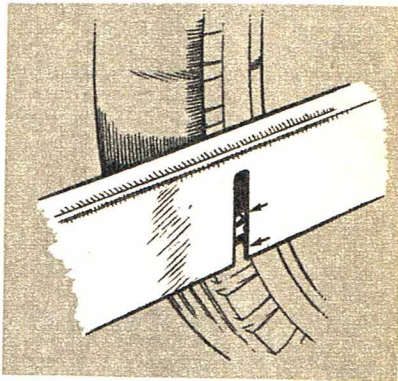
### PISTON-RING END GAP

The correct piston-ring end gaps will be quoted in your instruction book. A simple means of measuring the gap is to remove the ring from the piston and insert it in the cylinder bore. To ensure that the ring is accurately placed and not tilted, push it up the cylinder to the lowest position it will occupy at bottom dead centre. The gap can then be measured with a feeler gauge. Compression rings nowadays are usually tapered, so ensure that the edge marked "Top" is replaced towards the top of the piston.



### SEEING THE CHAIN

In these days of deeply valanced chain guards it is often difficult to see or reach the chain in order to adjust or lubricate it. An excellent scheme is to cut a slot about half an inch wide in the valance of the guard alongside the lower run. The slot should be made as near as possible halfway between the sprockets. Drill a  $\frac{1}{4}$ -inch diameter hole at each top "corner" and make the vertical cuts to the holes with tinsnips, or a hacksaw with a fine-pitch blade. Take off the rough edges by light filing.

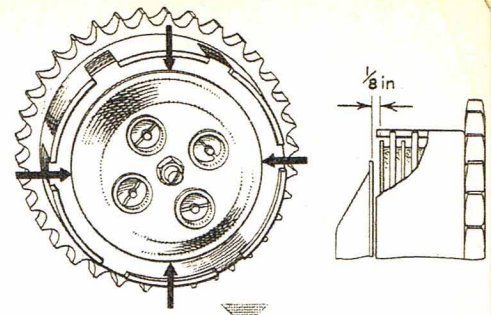


### HAND SPAN

One of the oldest hints in the experienced rider's repertoire is using a chain link to reduce the hand span required to operate the front brake lever. Even when that is done a little slack might be left in the cable so that more delicate control is possible and the throttle and brake can be operated simultaneously. Of course, there must not be so much slack that the lever can be pulled right back to the handlebar grip. Where a front brake is equipped with an external return spring (on the cam lever) it can very often be dispensed with in order to provide lighter operation. The internal pull-off springs on the shoes will usually give sufficient tension to prevent the cable casing from slipping out of its housing.

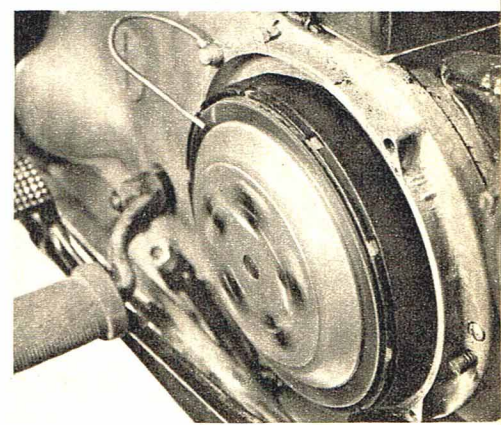
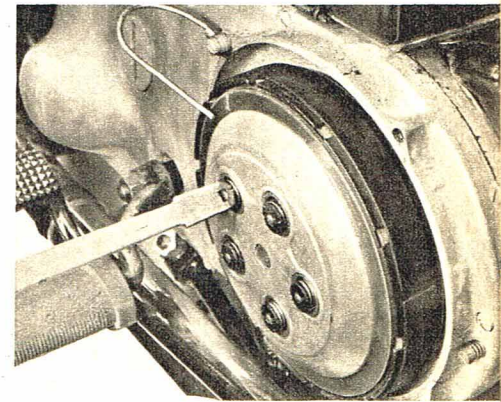
### EVEN CLUTCH WITHDRAWAL

Accuracy in lining up the clutch pressure plate will amply repay the trouble taken. With the primary chaincase or clutch dome removed, secure a pointer (which may be made from an old spoke) to a convenient bolt, and rotate the clutch slowly, adjusting the clutch screws as necessary until the pressure plate lifts squarely. Make sure, too, that the cups which hold the clutch springs are an easy, sliding fit in the pressure plate.



### BROKEN THROTTLE CABLE

Where a machine is fitted with a handlebar-mounted air control the solution should a throttle cable break is merely to swop over the throttle and air cables and operate the throttle by means of the air lever. But if there is no handlebar air control? Start the engine and increase the idling speed by means of the throttle stop on the carburettor body. The engine can thus be set to run sufficiently fast to get you home—or at least to the nearest garage. Another dodge is to attach a piece of string to the throttle. The string is threaded through the throttle spring, out through the carburettor top and up to the handlebar where it can be pulled and released fairly easily with the right hand while the machine is on the move.



### RIDING POSITION

The ideal relationship between footrests and handlebar is one that allows the rider to poise on the footrests without exerting any upward pull on the grips. He is thus able to take his weight on the rests immediately he encounters a deepish pot hole. For that aim to be achieved the footrests must be fairly low, yet not so low as to allow them to hit the road when the machine is banked well over. One's feet should be as near horizontal as possible, since a downwardly projecting foot can all too easily become trapped between the

rest and the road. In many cases the position of the footrests is limited by the range of adjustment possible on the brake and gear pedals. The ideal is to be able to brake and change gear without raising the feet from the rests.



★ **French Chalk:** How often have you opened a puncture-repair outfit to find the french chalk spilled over the patching material? A couple of turns of insulating tape round the screw cap serve to lock it in place and provide a seep-proof joint.

★ **Oil Barrier:** Before starting a dirty job in the garage rub undiluted soft soap or oil into your hands. Either will prevent dirt from becoming ingrained. There are, of course, proprietary barrier creams on the market which will prove equally effective.

★ **Waterproofing:** Smear balsa cement over insulating tape to make it waterproof. The cement dries, forming a hard, shiny coat impervious to oil and petrol as well as to water.

★ **Wear Your Helmet:** The correct place for a safety helmet is on your head. Even when on holiday and you are setting out for a short ride from base, your helmet should be worn.

★ **Tar Stains:** Wet tar on you, your clothing or your machine can be removed with a rag dipped in eucalyptus (from any chemist). Any sign of a stain remaining on clothing can be cleaned off with petrol or a solution of household detergent.

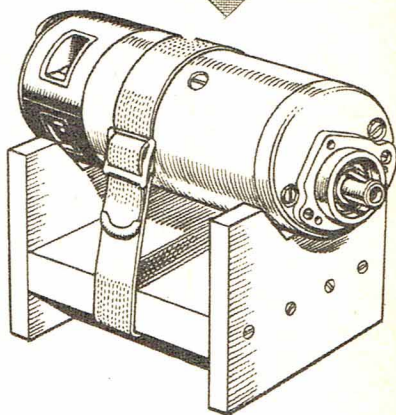
★ **Not Too Many:** The cups of ball bearings are never completely filled—so do not attempt to pack in a ball too many.

★ **Neckwear:** Where wet-weather riding is concerned, a towel or baby's napkin makes better neckwear than a woollen or silk scarf because towelling has a greater capacity for absorbing water.



### DYNAMO JIG

Work on a dynamo can be simplified if a simple wooden jig is made up as shown in the illustration. For holding the generator unit on the jig all that is required is a webbing strap—or even a pair of aerolastics.



### LUGGAGE IN A SIDECAR

The footwell for the rear passenger in a two-seater sidecar is an excellent place for carrying, say, bedding for a camping trip. The bedding is made up into a parcel and stout cardboard placed on top for the passenger's feet.

### QUIET AT NIGHT

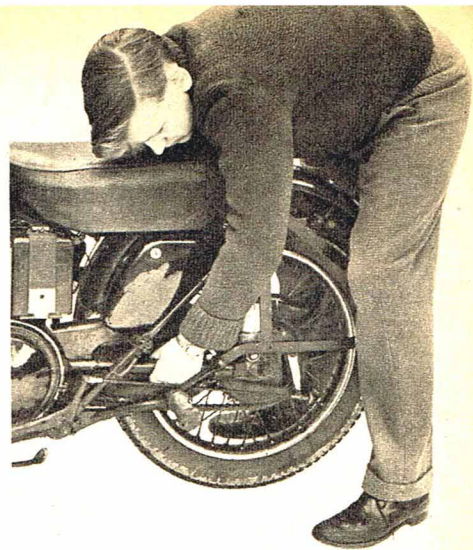
When you are riding very late at night or early in the morning remember that people in towns and villages through which you pass are fast asleep. Speed should be kept down, upward changes made as soon as the engine will accept a higher gear and downward changes delayed as long as possible. Softly, softly. . . .

### NO CHARGE INDICATED

Should the ammeter of a dynamo-equipped model show no charge, the fault could lie in the voltage-control unit. It is therefore a useful safeguard to detach the dynamo leads and so eliminate any risk of burning out the dynamo.

### PIVOT-BEARING WEAR

To check the bearing of a pivoted rear fork for wear, the technique is to stand astride the rear mudguard and grip the fork arms near the pivot. There should be no perceptible up-and-down or fore-and-aft movement at the bearing.

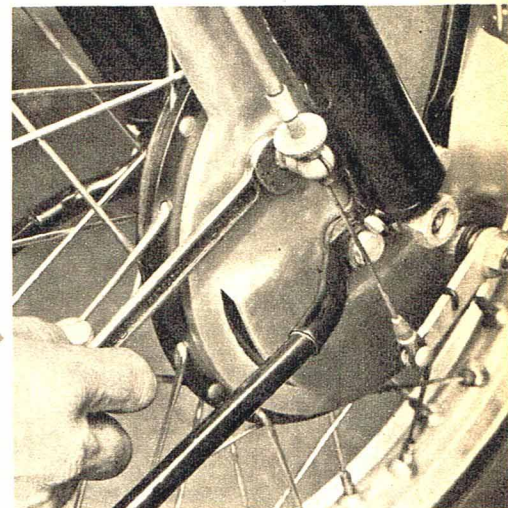


### SYNTHETIC-RUBBER TUBES

Many have the impression that it is difficult to repair synthetic-rubber tubes, yet in fact there are no difficulties. Because the surface is extra smooth, greater care than with natural rubber is necessary in that the area to which the patch is to be applied has to be thoroughly roughened and cleaned. Rubber solution will provide all the adhesion required and should always be used, even when the patches are of the self-adhesive pattern.

### VALVE-SPRING REMOVAL

Where the valve-spring collar is small or recessed, the prongs of a valve-spring compressor may tend to slip off during valve removal. The solution is to interpose a  $\frac{3}{4}$ -in-diameter steel washer between the spring collar and the compressor.

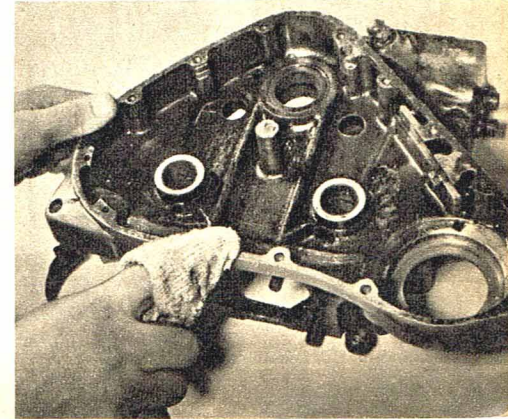


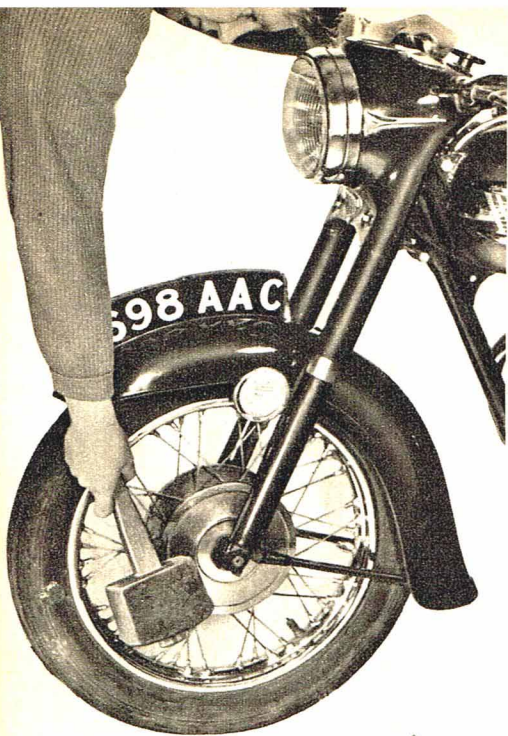
### CENTRALIZING BRAKE SHOES

In order to centralize the brake shoes in the drum after reassembly, the brake should be held hard on by means of the cam lever while the wheel-spindle nuts are tightened. On some brakes centralizing is carried out by slackening off the shoe pivot bolt on the outside of the shoe plate, applying the brake and then re-tightening the nut.

### CLEANING OFF COMPOUND

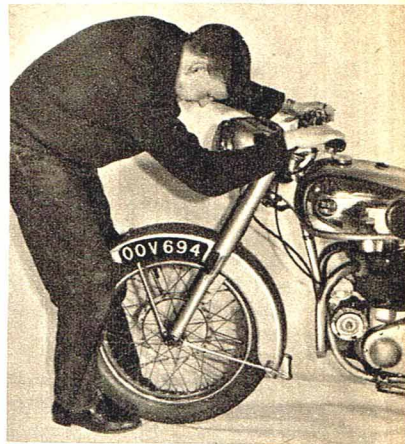
A clean rag soaked in methylated spirit effectively removes all traces of old jointing compound without the use of a scraper—and, therefore, without risk of damage to the joint faces. The same rag can be used to clean off compound which may have found its way on to one's hands.





### FORK ALIGNMENT

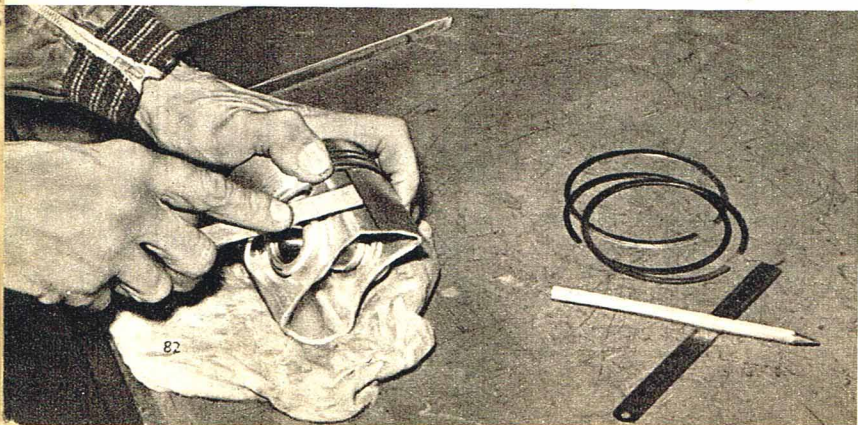
Angular impact with a kerb or wall, or a mild spill, can cause slight malalignment of telescopic front-fork legs. Provided no parts have been damaged, matters can quickly be put to rights. The procedure is to slacken off the wheel-spindle nuts (and pinch bolts if any), the top plugs and the main stanchion pinch bolts on the fork lower yoke. A few judicious blows with a mallet on the tyre and wheel spindle should jar the



fork legs back to their original position. Yet another method, after the slackening-off procedure has been dealt with, is to place the front wheel between your knees and, at the same time, give the handlebar a few sharp jerks. A check that the legs are parallel can be made by sighting one against the other.

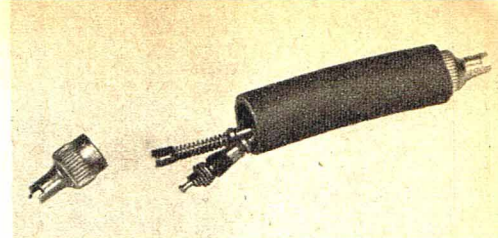
### REMOVING HIGH SPOTS

Irregularities on a piston can be eased by means of a fine-tooth file. Pencil lines are made to indicate the bearing faces and the surfaces brought down as shown. In order to prevent the piston from being scratched it should be rested on a cloth rather than directly on a bench which, perhaps, may have a covering of swarf.



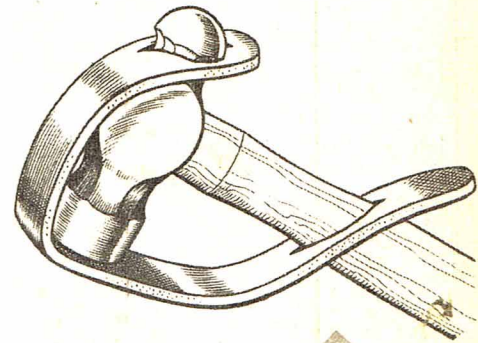
### SPARE TYRE-VALVE CORES

An essential part of any puncture repair outfit, spare tyre-valve cores can be carried safely in a short length of rubber tube, the ends of which are sealed off by valve caps. The scheme has the advantage that all the valve spares are kept together.



### SIDECAR CONDENSATION

The damage caused by moisture inside a sidecar can be almost as great as that which results if the outside is allowed to deteriorate. To make a body immune from the effects of condensation, wood-to-metal joints should be sealed off with bitumastic putty to prevent water seeping through and so causing rusting and rotting. Another excellent scheme is to drill one or two  $\frac{1}{4}$ in holes at the lowest points of the seat well to allow water to drain away.



### MAKESHIFT MALLET

Where no mallet is available a makeshift can be made up from a hammer and a length of stout leather strap. Slots are cut in the strap so that it may be threaded over the hammer head in the manner shown.



### USING A FILE

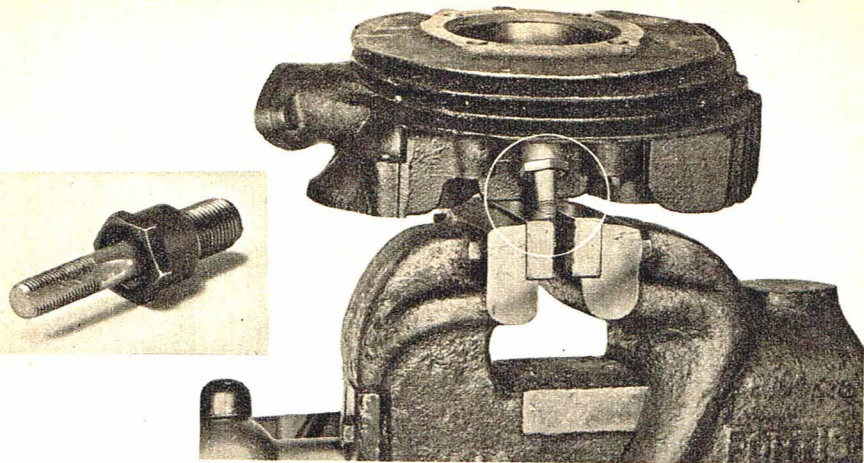
A file should never be used without a handle—the illustration shows the reason plainly enough. Should the file stick, its tang can cause severe injury to hand or wrist. If a handle is not available, the tang should be wrapped in a folded duster or in a wad of cotton waste.

### NO NEED TO DRAIN

If, on a fuel tank fitted with a U-tube connecting the compartments, a tap is fitted between each boss and U-tube union, draining becomes unnecessary before the tank is removed. Failing that, a simple method of draining is to make up a narrow, vee-shape trough from an old tin box, hold it under and in line with the U-tube and slacken one of the unions. Petrol will immediately run down outside the U-tube and can be caught in the trough and thereby led into a suitable container.

### ELECTRIC DRILL AS A LATHE

For such tasks as cleaning up valve heads and stems an electric drill can be used as a lathe. The valve stem is gripped in the chuck and cleaned as it rotates at speed by means of a small square of worn emery cloth held between forefinger and thumb. Of course the drill should be mounted either on a proprietary stand or in a vice.



### HOLDING A HEAD

Some means of holding a cylinder head securely when it is being decarbonized is desirable. This is where one of your old sparking plugs—if it is of detachable type—can be called back into service. The inner gland nut is unscrewed and the insulator replaced by a  $\frac{7}{16}$ in bolt, the head of which is filed down until it fits inside the plug body. The gland nut is then replaced and screwed up hard. Finally, the modified plug is inserted in the boss in the head, and the bolt is clamped in the vice. If you file flats on the bolt shank the vice will get a firmer grip. Both your hands are thus free for using the tools.

### RUBBING BRAKE?

It is important to remember that there is generally some variation in brake geometry with up-and-down travel of the rear wheel. When a pillion passenger is carried and the rear-springing compressed to a greater extent than usual, it may be necessary to slacken off the rear-brake adjustment. If this is not done there is a chance that the brake will rub, causing rapid wear and overheating. Should a brake overheat excessively grease in the hub bearings may melt and reach the friction linings.

### WINDSCREEN CLEANING

Particles of dry grit should never be rubbed off a plastic screen (or off goggles for that matter whether they have plastic or glass lenses). The scheme is first to wash the screen, using a sponge and plenty of water, then to dry it with a wash leather and to follow up with a rub over with a soft, dry cloth. Scratches in Perspex and similar materials can be rubbed out with metal polish—but obviously prevention is better than cure.

### CHAIN RIVET EXTRACTION

Few enthusiasts in these days carry a chain rivet extractor in the tool kit. However, should a chain repair be required at the roadside, rivets can

be removed simply by the use of a 3in length of coarse-cutting carborundum which costs only a few pence and is easily stowed. The scheme is to “file” off the rivet head—and the carborundum does the trick with very little effort.

### BATTERY TOPPING-UP

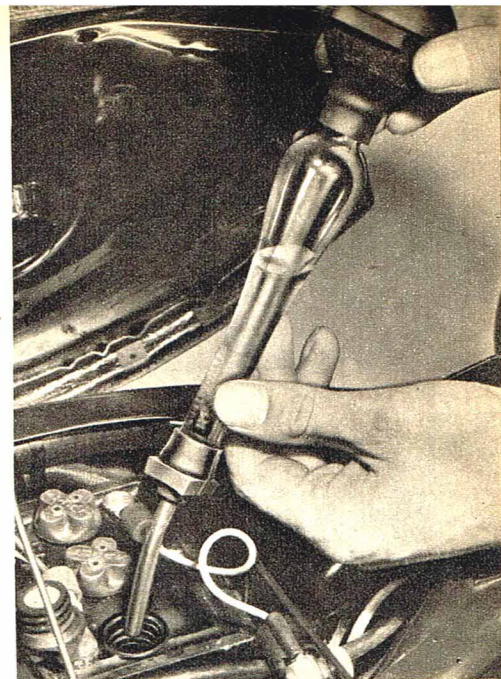
If one of the special battery fillers is not available, by far the best means of topping-up without spilling distilled water is to use a hydrometer with, for preference, the float removed. Should you have no hydrometer then a plastic funnel can be used instead. But should you be caught out without a funnel, take a strong envelope, cut it diagonally, snip off the closed corner and you have a ready-made cone.

### OVERCOMING STICTION

Scooter owners whose machines are fitted with electric starters often find that the machine lurches forward when bottom gear is engaged after a prolonged stop. The reason is that the clutch plates are sticking and therefore the drive between the engine and gear box is not freed when the clutch lever is operated. Motor cyclists free their clutches by depressing the kick-starter once or twice with the clutch disengaged. Even those scooterists whose machines have no kick-starter can achieve similar results by engaging gear before starting the engine and rocking the machine backwards and forwards with the clutch disengaged.

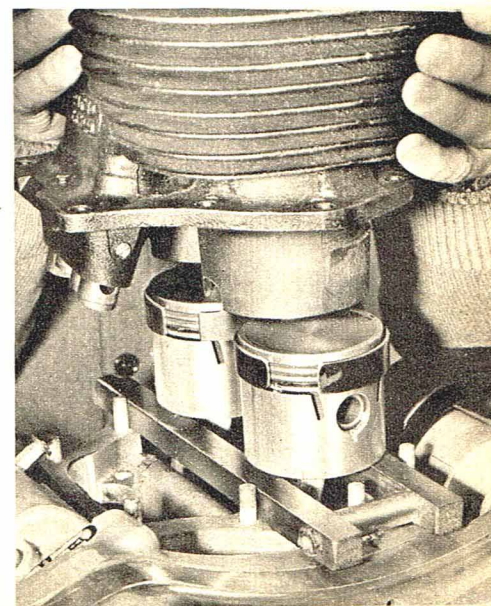
### FITTING A CYLINDER BLOCK

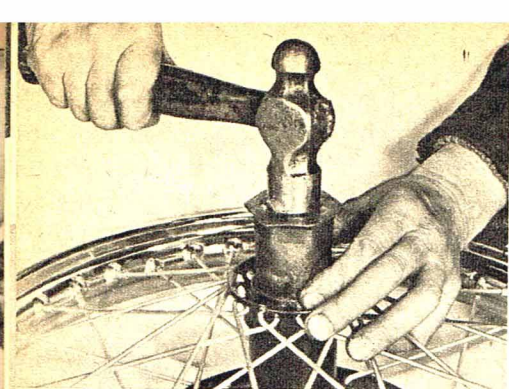
Before fitting the cylinder block of a parallel-twin engine, place two pieces of soft wood measuring approximately  $6 \times \frac{3}{4} \times \frac{3}{4}$ in across the crankcase mouth; they will ensure that the pistons are in line and firmly supported. After the pistons have been oiled and the ring compressors fitted, the block can be lowered over the pistons and the wood and compressors withdrawn.



### WET BRAKES

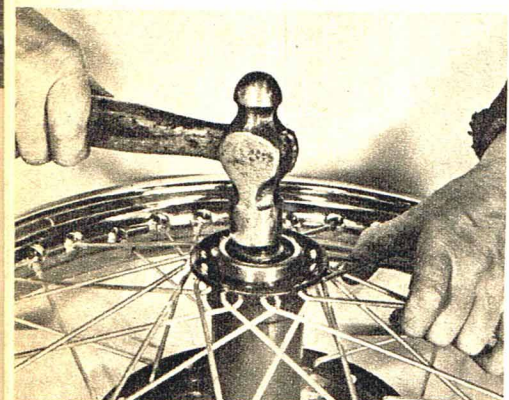
On a long journey through torrential rain, wise riders test the brakes periodically to ensure that they have not been affected by water. If the brakes do become wet internally they can be dried out by riding with them lightly applied for brief periods.





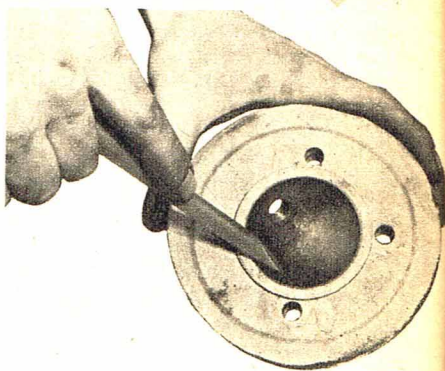
### FITTING WHEEL BEARINGS

The outer races of a ball-journal or taper-roller wheel bearing can be fitted without the aid of a press. However, care is necessary since the races are hard and somewhat brittle. The scheme is to place a tube of suitable diameter, or a box spanner, over the *outer* ring of the bearing and use it as a drift. If no such drift is available a piece of wood can be fashioned for the job. As a last resort a hammer can be used, first on one side of the outer ring and then on the other, to overcome any tendency for the bearing to tilt and stick.



### DECARBONIZING

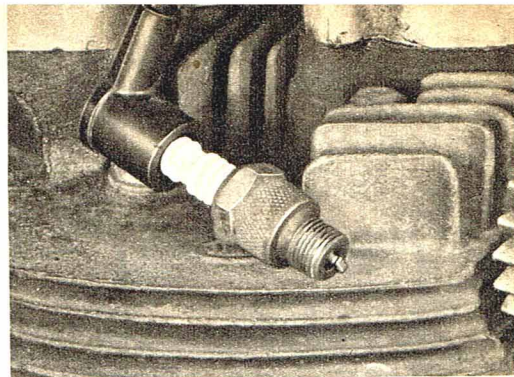
If the crown of a light-alloy piston and the combustion chamber of a light-alloy cylinder head are not to be scored while they are being decarbonized the carbon should be removed with a tool that is softer than aluminium alloy. Hence old hands' preference for using a relatively hard grade of tinman's solder.



The end of the stick is fashioned to a chisel-like edge and used as one would employ a normal scraper. A final polish can be given by means of a soap-impregnated steel-wool pad. Emery cloth should not be used unless it is very, very worn since, inevitably, it will tend to remove metal as well as carbon.

### PLUG OUT—AND IN

A sparking plug that shows a spark when it is lying on the cylinder head may not produce a spark when it is screwed in the cylinder head because gas pressure resists the spark. If a replacement plug is ineffective it is time to look elsewhere for the trouble.



### FLAT EXHAUST

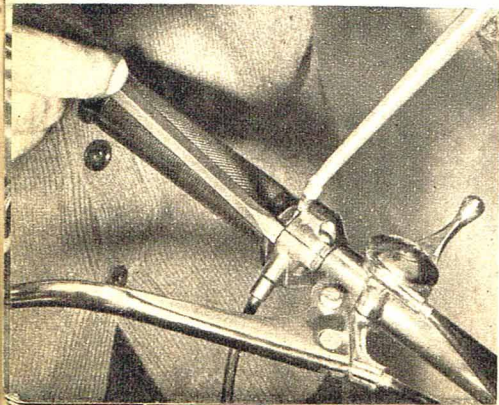
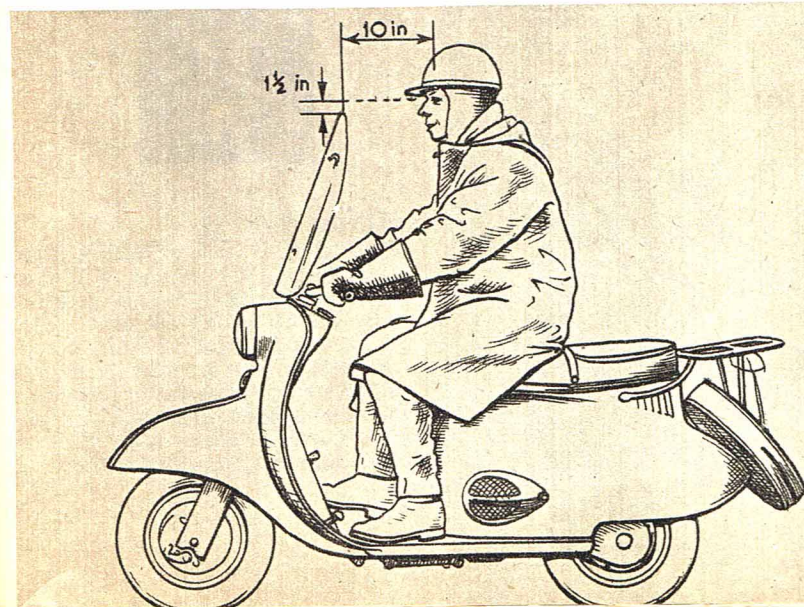
There are several possible causes of a flat exhaust note. First, it may be the result of retarded ignition timing caused either by the contact-breaker gap being too small or the magneto chain being too slack. Secondly, if the valve clearances are correct it may be that excessive wear of the cams, followers or camshaft bearings is upsetting the valve timing. Thirdly, it may be the result of an excessively weak mixture.

### NEW HANDLEBAR GRIPS

Replacement rubbers for the handlebar grips are generally too tight for easy fitting. If the grip is attached to a piece of string and dipped into the petrol tank for a few seconds it will "stretch" to the necessary extent and slide on easily. Once in place it will quickly return to its original dimensions.

### WINDSCREEN SETTING

A handlebar screen that is incorrectly set can be worse than no screen at all. If the screen is too low the airstream is directed into the rider's eyes and if it is too high visibility in rain is greatly impaired. Some experiment is usually necessary to get the best results. As a starting point the screen should be set so that the top edge is about 10in in front of your face and some 1½in below eye level. Rake and height can then be altered a shade at a time until goggles are not normally required except, perhaps, in the rain. Don't forget that, to achieve the best protection for your eyes when a screen is fitted, a peaked helmet is almost essential. The peak directs the airstream from the tip of the screen over your head.



### STICKY TWISTGRIP

Heavy twistgrip operation is often the result of nothing more than friction between the shoulder of the rubber or plastic grip and the cable drum housing. Where the grip is of plastic, a few drops of oil should be inserted between the two at weekly intervals. In the case of rubber, use french chalk instead of oil.



### TRANSPARENT CARS

Many modern cars are so low that the road ahead can be seen over the top by a motor cyclist who poises on the rests or by a scooterist standing on the scooter floor. Similar results can often be achieved by looking through a car—in at the back window and out through the windscreen (and *vice versa*).

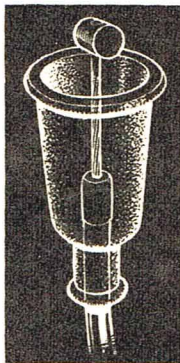
### SECURING TANK BUFFERS

With machines on which the tank is mounted on rubber buffers, inconvenience can arise when the tank is removed. The buffers may fall to the floor and roll out of sight; and on reassembly some fiddling is generally required to line them up between the tank supports and the boss for the bolt. The trick is to secure the rubbers to the underside of the tank with a rubber-base adhesive.



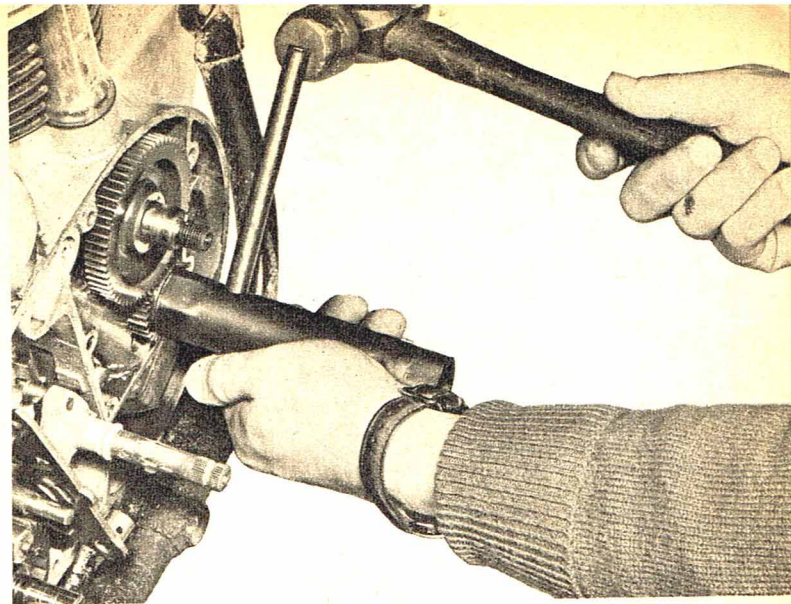
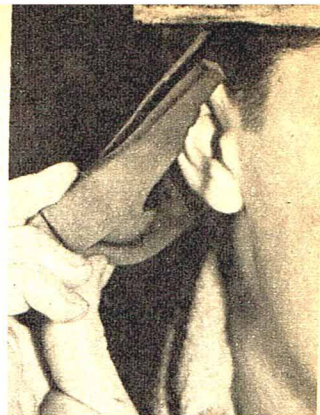
### DRAUGHT-PROOFING A HELMET

It is not always easy, even with the best-fitting helmets, to prevent draughts entering between the fore part of the neck curtain and one's face. The remedy is to obtain two surgical cotton-wool pads (or rectangles of foam-rubber) and stitch them to the inside of the neck curtain at the points of draught entry.



### OILING CABLES

When there is time to hang a cable, a cup to hold the oil can be formed at the upper end by means of one of those rubber waterproof covers used at the magneto end of ignition control cables. Yet another wheeze is to make a cup from child's plasticine. Provided a light grade of oil is employed it will drain down between wire and casing in a few minutes.



### SHOCK FOR A NUT

A tight nut can usually be more easily loosened if a hammer is used on the spanner or tommy bar. A few sharp blows have far more effect than sustained uniform pressure. This system of "shocking" a nut is perhaps most effective in freeing a hexagon on, say, a timing-gear train in circumstances where hand pressure on the spanner merely causes the pinion or sprocket to turn, even against compression, without slackening the nut.

### SLUDGE DISPOSAL

After machine components have been washed in a paraffin bath a layer of sludge remains in the bottom of the bath when the liquid is poured away. A sheet of brown paper or newspaper placed in the bath before the paraffin goes in can be lifted out afterwards, bringing the sludge with it.

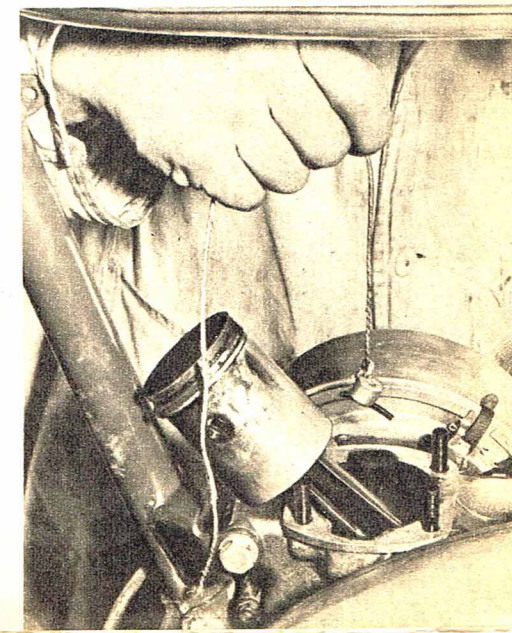
### SPEEDY FORK DRAINING

The job of draining most hydraulically damped telescopic forks can be speeded if the drain plugs are removed but the top plugs left in position. With drip trays pushed as close as possible to the walls of the tyre, the front brake is applied and the

fork pumped up and down. In this way the fork can be drained in a couple of minutes.

### FISHING FOR BITS

A screw or valve collet inadvertently dropped into the crankcase (or into an inaccessible cranny) can usually be retrieved by fishing, using a length of string and a pocket magnet.



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