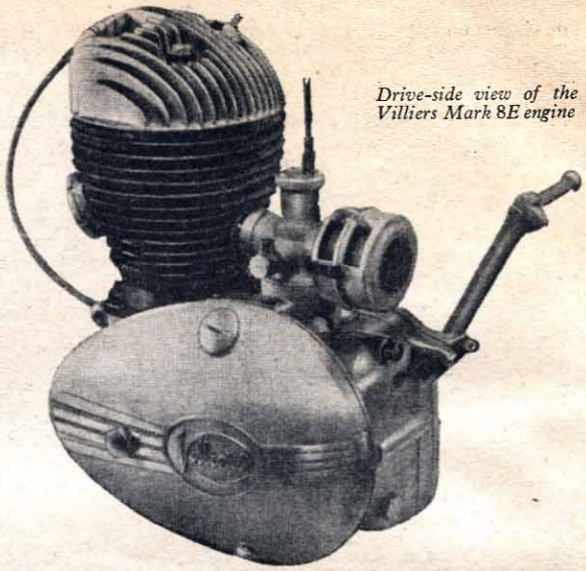
Villiers Mark 8E

A Modified 197 c.c. Unit Which Incorporates a New Carburettor



Drive-side view of the Villiers Mark 8E engine

A NEW version of the famous 197 c.c. Villiers two-stroke engine-gear unit is now in production. The latest model is designated the Mark 8E. Changes in the specification are mainly of a detail nature but with one important exception. That is, the engine is equipped with an entirely new Villiers single-lever carburettor. With this instrument, carburation is fully automatic throughout the throttle range; the need for a separate handlebar control lever to weaken or richen the mixture is eliminated.

Slow-running adjustment is obtained by means of a spring-loaded screw in the body of the carburettor; the screw controls an air bleed to the pilot-jet orifice. In addition to this pilot jet, a secondary pilot jet is provided to ensure a clean pick-up on to the needle jet. Another feature of the instrument is that all air feeds to the jets are taken from the inlet side of the air filter; hence all air entering the engine is filtered.

In outward appearance, the new carburettor is very similar to the Villiers two-lever type with handlebar-mounted mixture control. An oil-damped, gauze air filter is fitted which incorporates a new, concentrically operating air strangler for use when starting the engine from cold. The filter is retained to the carburettor body by two spring clips and is readily detachable. Where the throttle-control cable casing seats in the adjuster on top of the mixing chamber, a rubber grommet is fitted to exclude water and dirt.

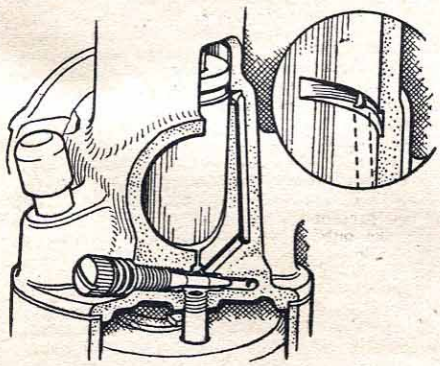
Internal construction of the carburettor is basically similar to that of its predecessor. That is to say, there is a cylindrical throttle slide which carries a needle; the latter operates in the centre-piece jet (or needle jet). The needle-jet tube, into the side of which is screwed the main jet, is located directly in the float chamber and forms a guide for the float.

As remote control over the position of the needle, in relation to the slide, is no longer necessary, the spring-loaded needle is held in a predetermined position by a retaining screw in the top of the slide. Anti-clockwise rotation of this screw allows the small spring around the head of the needle to raise the needle in relation to the slide, should any adjustment be called for. To lower the needle, and therefore weaken the mixture, the screw is, of course, rotated clockwise.

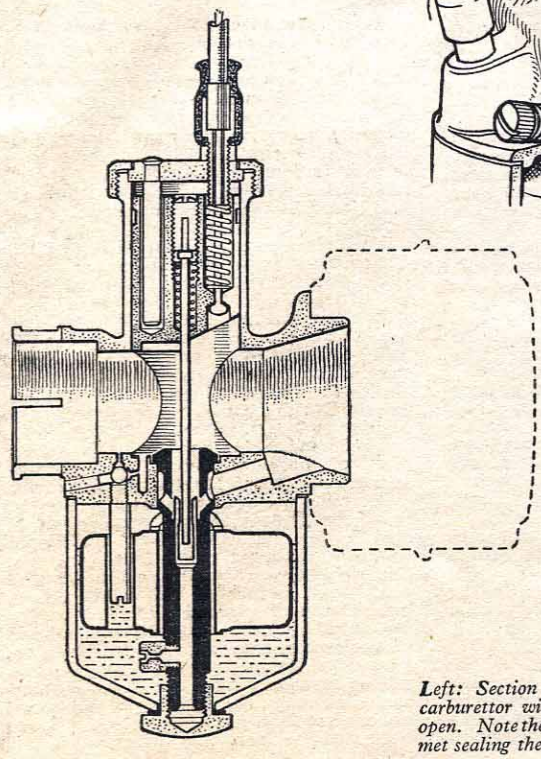
When the engine is running, the pilot jet regulates the mixture from the throttle-closed position up to about $\frac{1}{8}$th throttle opening, at which stage the needle jet comes into operation. But before this stage is reached, the pilot jet is supplemented by a compensating, or secondary, pilot jet. This has its outlet into the choke tube on the atmospheric side of the throttle slide and cannot operate until the slide is approximately $\frac{1}{16}$in open. As mentioned, the aim has been to provide a clean pick-up on to the needle jet.

In addition to the normal air supply to the pilot jet, a further air supply is provided by means of an automatic air bleed. This bleed is controlled by a porting system formed by two annular grooves, one cut in the throttle slide, and one in the inner wall of the slide housing; the second groove is connected by drillways in the carburettor body to the pilot jet. Air can be drawn in by this route only when the two grooves overlap each other and this occurs solely when the throttle is closed.

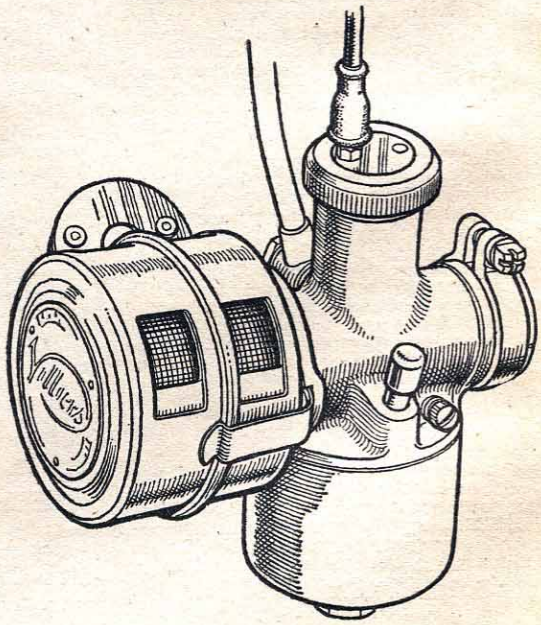
The function of this auxiliary air supply to the pilot jet is to ensure that when the throttle is closed with the engine turning over fairly quickly, the resultant depression over the pilot jet does not produce an over-rich mixture. Too rich a mixture under



Above: Automatic pilot air bleed, showing the arrangement of the ports. Also shown is the pilot air screw



Left: Section showing the carburettor with slide fully open. Note the rubber grommet sealing the control cable



Right: The new Villiers single-lever carburettor has a strangler incorporated in the air-filter casing

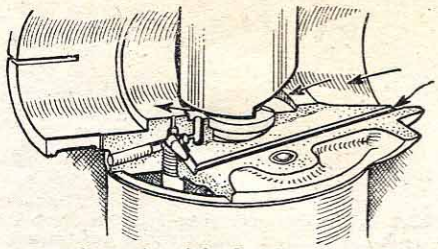
these conditions—say, on a short, steep descent—results in spasmodic firing on the overrun, and a tendency towards four-stroking when the throttle is re-opened.

Some time ago, a member of *The Motor Cycle* staff had the opportunity to cover 300 miles on a two-stroke equipped with a prototype of the new carburettor. It was found that the pick-up throughout the throttle range was clean and progressive. A slow, reliable and fairly even tick-over could be obtained by adjusting the pilot-jet air screw.

Several detail modifications have been made to the engine. One of the three ball journal bearings which support the crankshaft is of increased diameter. In the interests of maximum transmission smoothness, both engine and clutch sprockets are of ⅜in pitch (compared with ½in previously). An extra cooling fin has been added to the cast-iron cylinder barrel, while on the light-alloy cylinder head, the space formerly occupied by a decompressor has been taken up by finning (a decompressor will continue to be available on the competition engines).

The Villiers flywheel mag-generator has been rendered waterproof by the introduction of a synthetic rubber seal into the cover joint. To prevent condensation, a small breather pipe projects upward from the rear of the generator case. A redesigned primary chaincase cover incorporates a ⅝in-diameter filler plug, in an accessible position near the top of the cover; a separate oil-level plug is located in the lower part of the cover. Any petroil messiness which may be caused by overflooding of the float-chamber is now led direct to the ground by way of a ⅛in drain hole in the shallow well immediately below the carburettor.

A locking device which operates on the ratchet principle has been applied to the gear selector quadrant. This provides, in effect, a safety catch to prevent the pinions from jumping out of mesh when under heavy load; this device is, of course, additional to the positive-stop mechanism. Oil seals are fitted on the kickstarter and gear-control shafts, and on the gear-box mainshaft behind the final-drive sprocket; the sprocket can be removed without disturbing the oil seal.



Slight opening of the throttle causes air to be drawn over the compensating jet as well as over the pilot jet. The internal air passage to the jets is also illustrated

Manufacturers are the Villiers Engineering Co., Ltd., Marston Road, Wolverhampton.

A Packaway Scooter

Novel French Design Makes its Début in London

The small wheels and compact dimensions of the Bouffort scooter are apparent from this photograph. Note the hinge-down rear number plate

A NEW scooter was introduced recently to the Press at the French Club, London. Designed by M. Bouffort, of Paris, it possesses a number of interesting features, the most striking of which is its ability to be quickly dismantled and packed into a space small enough to allow it to travel in the boot of a car, or to be easily stored in a passageway or cupboard at home.

The scooter comprises three main sections: a box-shape chassis-cum-body, the power unit and the steering assembly. The first measures about 20in long × 13in wide × 16in deep and is framed in angle-section light alloy with aluminium panelling; the top is hinged along one side and carries a slab of sponger rubber which forms the seat.

The engine is a Villiers 98 c.c. Mark IF two-speed unit which is mounted on a fork of steel tubing and enclosed within the box. The fork also carries the rear wheel and pivots at the lower front end of the box. Wheel movement is controlled by means of rubber bands which link the rear end of the fork to the rear floor of the box. The petroil tank is attached to the left-side panel of the box and accommodates about one gallon of fuel.

The steering assembly consists of a triangulated steel-tube frame of welded construction, which links the box with the steering head. The front wheel is carried in a simple unsprung fork. Attachment of the frame to the box is by two removable pins, while at the steering head there is one removable pin and one pivot bearing. The handlebar fits into the head of the fork; the bar is located by a key and secured by a wing nut.

Removal of the three pins enables the complete front assembly to be detached and folded at the pivot. If the handlebar is also detached, the parts can then be stowed in the box, where they fit neatly behind the engine. A lifting handle at the front of the box enables the machine in its packed-up state to be wheeled along on the rear wheel without effort, rather like a wheelbarrow.

Tyres are of the small "doughnut" type. At present, a handlebar lever-operated rear brake only is fitted. The right side of the handlebar carries also the twistgrip throttle control and the small lever for gear selection, while the clutch lever is on the left. The various cables are sheathed in a plastic tube from just inside the box to the point of their divergence at the handlebar.

Clean Exterior

On the rear panel of the box is a lid which hinges downward and has the registration number painted on its inside face, so that this is displayed when the lid is opened. When the machine is packed for transit or storage, the lid is closed to present a clean exterior.

After a demonstration by M. Bouffort, a member of *The Motor Cycle* staff tried the scooter on the road. Since the weight is only 84 lb, the machine was found to possess a lively performance, with an estimated maximum speed in the region of 40 m.p.h. The riding position seemed strange at first because of the low seating position and the necessity of placing the feet on the lower tubes of the front frame, with the knees splayed out to clear the rather low handlebar. A rider of shorter stature would probably be able to adopt a more normal knee position. Apart from this positional peculiarity, comfort was good: the designer claims to have ridden the scooter from Paris to Zurich in a day and a half, without any prior "bed of nails" training.

Concessionaires for Great Britain and the U.S.A. are Le Guen and Co., Ltd., 146, Bishopsgate, London, E.C.2.; the firm is negotiating for the manufacture of the scooter in both countries. It is hoped that the first British prototypes will be built shortly, but some time will elapse before production begins.

The handlebar and steering assembly can be stowed inside the box which can then be wheeled along by the handle seen in front of the seat cushion

Important Road Races

IT has been announced that there will be manufacturers' support for the following road-race meetings during the coming season: April 18, B.M.C.R.C. meeting at Silverstone; August 3, A.C.U. International Road Races; September 16-19, Scarborough Road Races; September 26, B.M.C.R.C. Hutchinson "100" Races at Silverstone. At the first and last meetings, support will be limited to events of 50 miles and over.

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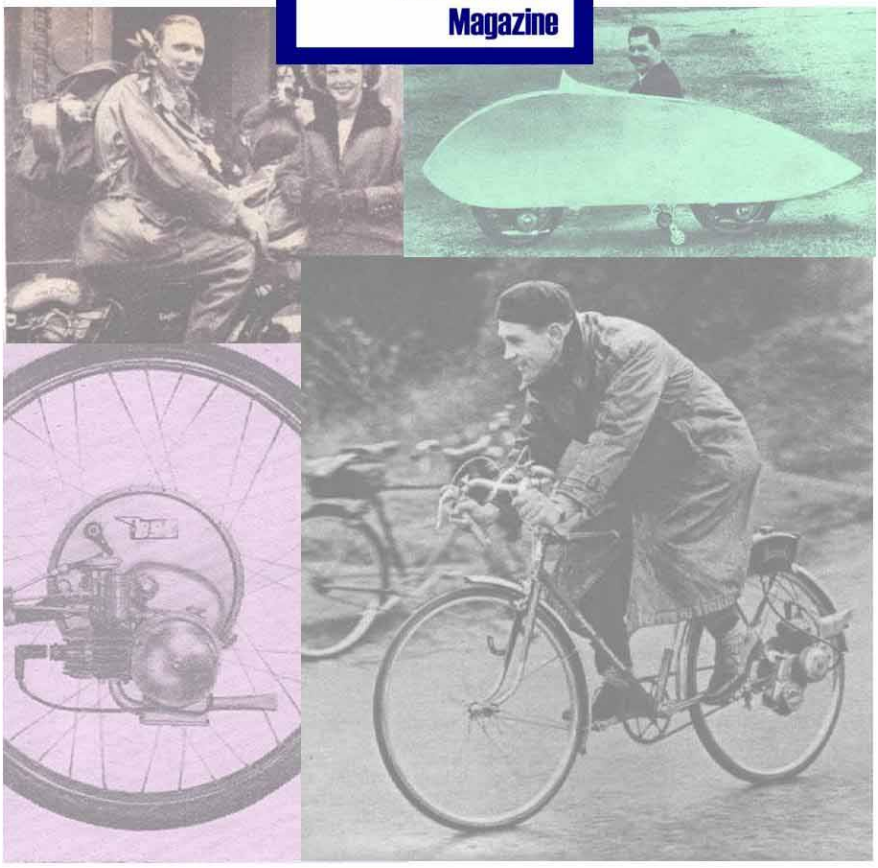

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