

# MILLERS MAKE a CYCLEMOTOR

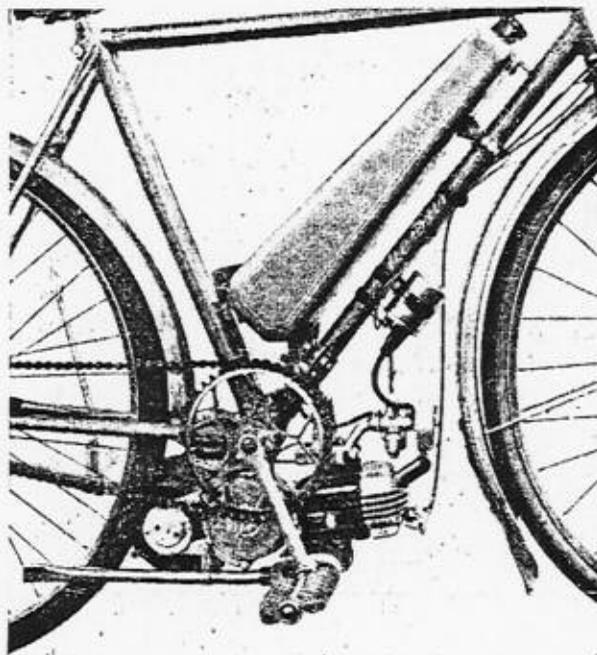
Description and Brief Road Impression of the 48 c.c. Unit Shown at Brussels by Famous Electrical Factory

**I**NTRODUCED at the 35th Brussels Show, the cycle motor attachment developed by H. Miller and Co., Ltd., of Birmingham, proved to be, so far as British exhibitors were concerned, one of the Show surprises. This engine has, in fact, been under development for some time but, as yet, is not in production.

Designed to be mounted horizontally beneath the bottom bracket of any cycle and narrow enough to be fitted between the pedals without modification of the cranks, the new unit is of 48 c.c. capacity, with 38 mm. bore and 42 mm. stroke.

An aluminium sand casting is used for the cylinder head, which is hemispherical in shape and bored for a 14 mm. plug and decompressor. Finned longitudinally, the barrel is of iron and has four ports disposed at 90 degrees; inlet and exhaust face each other at top and bottom, and the two transfer ports at each side mate up with passages in the mouth of the die-cast, light-alloy crankcase.

Mounted on two ball bearings, the crankshaft assembly is machined from two steel forgings joined by a ground crankpin pressed into each half. Crankcase com-



(Above) Dennis Hardwicke tries a bicycle fitted with the Miller motor over Birmingham's rain-swept streets. The low c. of g. afforded by the engine position is a distinct advantage under such conditions.

(Left) An offside view of the unit which drives the rear wheel via a roller in contact with the tyre. Note the separate ignition coil. On later models it will be concealed in a compartment in the tank.

pression is maintained by synthetic rubber, spring-loaded oil seals behind each bearing. Rollers run direct on the crankpin and in the ground eye of the forged I-section steel connecting rod. A phosphor-bronze bush forms the bearing for the gudgeon pin of the light-alloy piston, which has a domed crown. Three rings are fitted, and each ring groove is pegged.

The drive from the crankshaft is taken to the roller drive by a pair of pinions, the first a nickel-chrome steel forging and the second, twice the diameter of the first, a composite structure containing the ignition-lighting generator. Both pinions are keyed on tapers of their respective shafts. Ball

bearings to carry the wheel-roller shaft are housed in crankcase extensions, that on the drive-side part of the crankcase die-casting extending rearward and also forming the inner half of the pinion casing; that on the off side by a triangular steel bridge bolted and dowelled to the crankcase.

The drive roller, lying parallel to, and on the same longitudinal axis as, the crankshaft is a composite unit. A steel shaft is surrounded by a rubber bush, and a castellated steel sleeve of 3/4-in diameter, the whole being bonded together. Insulation and shock absorption is thus provided at one and the same time.

Before detailing accessories, generator,

carburetter and ignition, it would be as well to describe the ingenious but rather complicated engine mounting and method of engaging the drive-roller.

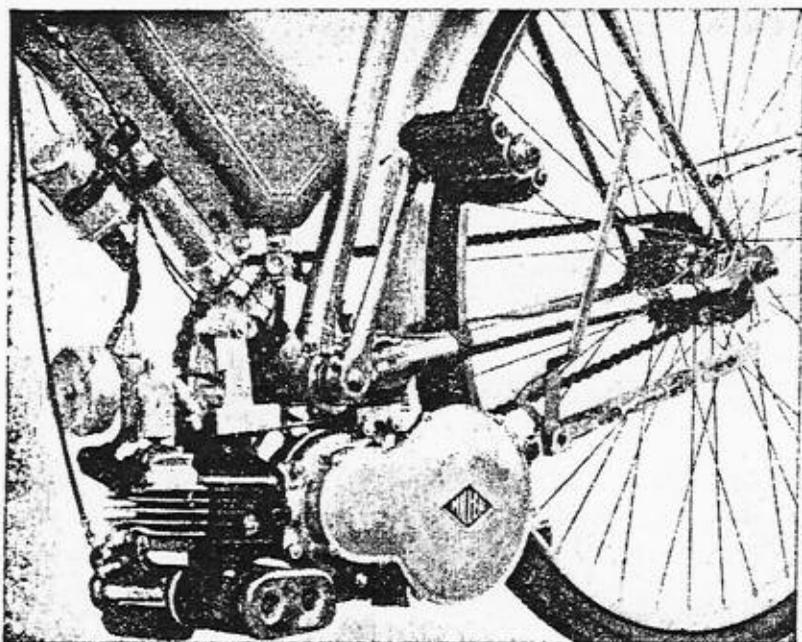
The complete unit is hung on two slides. Clamped to the cycle down tube, the first consists of a channel-sectioned block fixed with the lips of the channel facing down. Two grooves are machined along the inside of the down-facing lips and are engaged with dowels on each side of the inlet port. A second slide of similar cross-section is attached by means of a universal clamp to the frame tubes at the rear of the cycle bottom bracket. A lipped block mounted above the crankcase engages with the slide.

## Roller Engagement

Movement is thus on a horizontal plane and is restrained by a two-piece pressed-steel extension, turned up at its end, eyed and fitted over the rear wheel spindle. The front piece of this extension, a flat steel strip, is bolted to the roller-drive cover and, extending back, fits into the narrow channel-section pressing bolted to the wheel spindle. A three-positioned gate, also a part of this channel pressing, has a right-angled crank pivoted to its base and its horizontal arm is joined by an adjustable link to a pin riveted to the rear end of the flat strip, the latter being slotted to pass the bell-crank pin.

Alteration of the position of the vertical arm of the crank in its gate moves the engine and brings the roller into contact with the tyre. Positions on the gate are "on" and "off," with a third notch which, when used in wet weather, brings tyre and roller into closer contact.

Ignition and lighting are provided by an A.C. generator skilfully incorporated in the secondary drive pinion, which is but 1/4 in. in width overall. A steel boss carries a brass disc, lipped just within its outer periphery, on to which is riveted the toothed drive ring of fibre or a non-



In this view will be seen the case housing the gear primary drive in the larger pinion of which is carried the A.C. generator. The lever shown actuates the roller engagement mechanism.

magnetic alloy. On the inner side of this lip are screwed four laminated pole-pieces which, bevelled at each end, hold four magnets firmly in position. Four stationary coils, in square formation, screwed to the outside alloy drive cover, sit neatly within the rotating magnets and pole-pieces. In addition to ignition needs, the

unit will give 9 watts for lighting.

Low-tension current from these coils is taken to a small 6-volt ignition coil now located on the cycle down tube, but later to be transferred to a recess in the base of the fuel tank. From the ignition coil, the low-tension current continues to an unconventional contact breaker operated

by the off-side mainshaft. The breaker assembly is mounted on a steel plate screwed to the crankcase and the plate has curved locating slots; ignition timing adjustments are made by rotating the plate in these slots.

The pivoted point is operated by an arm, the foot of which engages on an internal cam formed by a shaped sleeve that is pressed into the hollowed end of the mainshaft. A chromed steel plate forms the cover of this unit.

A small Amal type 308 carburetter is bolted to the forward facing inlet port and receives petrol from a steel container clamped to the front down tube. Exhaust gases discharge into a box-shaped expansion chamber mounted beneath the engine.

### The Controls

Handlebar controls are limited to two in number, a throttle and a decompressor. Starting mixture is obtained by a choke fitted to the intake of the carburetter. Drive is engaged and disengaged when stationary, by the lever on the torque stay and control in motion is confined to throttle and decompressor.

With the unit on test in Birmingham, starting proved remarkably easy, the engine firing almost as soon as the pedals were turned and the decompressor lever released. A subsequent restart proved it possible to dispense with the decompressor.

Plenty of power was available and an ability to two-stroke evenly at low speeds and with light load was revealed. Control, with but two levers, was simplicity itself.

No price has been established, but whatever the final figure may be, the quality of material and the detail design is excellent.

## R.A.C. — A.C.U. TRAINING SCHEME NEWS



(Above) Miss Marjorie Cruse, of Slough. (Right) Cambridge tailors, Messrs. Walker & Walker, recently featured this display to give emphasis to the training work of the Cambridge Centaur Club.

### FARNHAM ROYAL M.C.C. "CENTURY"

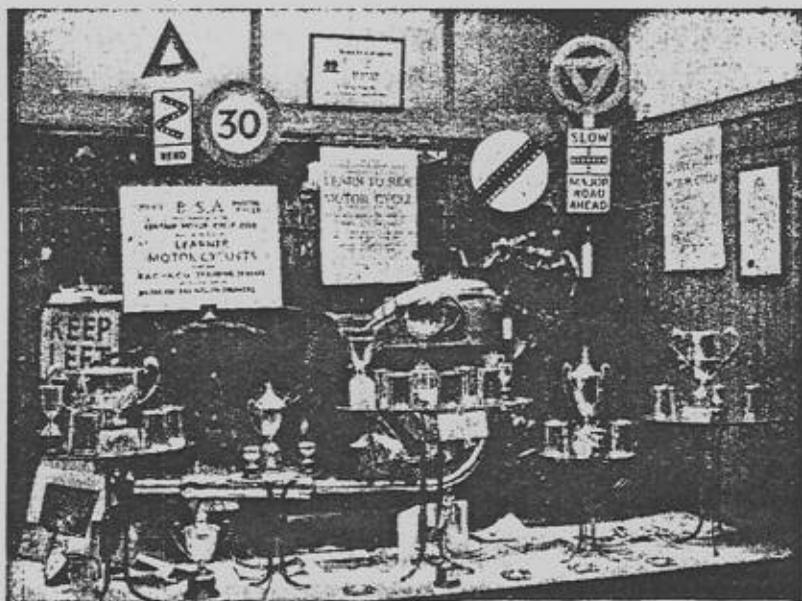
THE 100th trainee to pass out of the Farnham Royal Motor Cycle Club's R.A.C. training scheme was a girl—Miss Marjorie Cruse, of Hilperton Road, Slough. The club holds its "school" at an old tank repair depot in Slough. Marjorie's brother, Ken—now drilling for water in French West Africa—competed in the Junior Manx Grand Prix last year.

### PORTSMOUTH HELPS LEARNERS

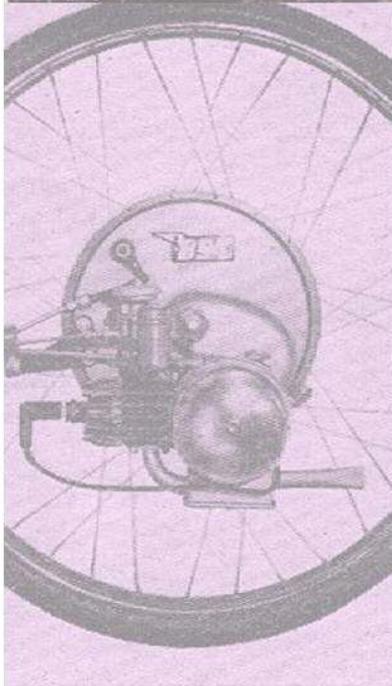
THE Portsmouth Accident Prevention Council are to ask the City Fathers to allow roads inside one of the municipal depots to be used for the organized training of motorcyclists. The scheme has the blessing of the local police and the Waterloo M.C.C., and instruction will be given under the aegis of the R.A.C./A.C.U. training scheme.

### SIXTEEN HUNDRED SAFE RIDERS

BY the end of 1951, no fewer than 1,632 young motorcyclists had qualified for the Proficiency Certificate issued to successful pupils of the R.A.C./A.C.U. Training Scheme for Learner Motor Cyclists, prior to taking the official Ministry of Transport driving test. Details of this scheme are obtainable from Mr. A. Thomson, Motor Cycle Manager, Royal Automobile Club, Pall Mall, S.W.1.



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