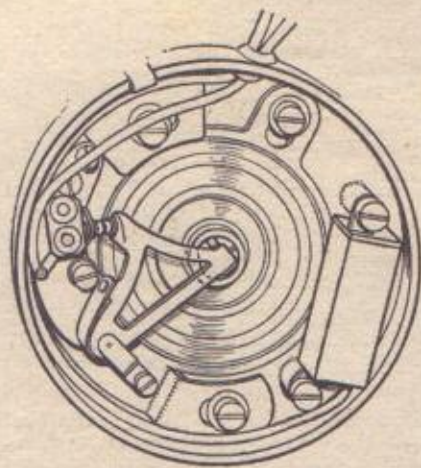


The Miller Cyclemotor

Full Technical Description and Trial of the New Miller Cycle-attachment Unit Exhibited at the Brussels Show



The contact-breaker is actuated by an internal cam on the hollow right-hand mainshaft

A SURPRISE exhibit at the Brussels Show—and one of the most interesting technically—was the new Miller cyclemotor. As will be remembered from the brief description in last week's issue of *The Motor Cycle*, the engine is a 48 c.c. (38 x 42mm) two-stroke, designed for mounting below the bottom bracket of a cycle frame. Dimensionally, the engine is very compact, as indeed it must be for mounting in this position. The unit has to be shallow enough not to reduce ground clearance excessively, and narrow enough to fit between the pedal cranks. Width reduction, therefore, was among the chief aims behind the design.

There were other objectives of equal and even greater importance, however. Probably the chief of these was simplicity. Small two-strokes such as this require decarbonizing after, say, 2,000 miles. It was felt to be essential that the task should be easy enough to be carried out by the non-technical user, and on his or her kitchen table if need be. Overhaul and servicing problems, too, were considered to be of vital importance. In this connection, the engine main and countershaft bearings are all ball journals of similar dimensions, and the mainshaft and countershaft nuts are interchangeable.

Cushioned Drive

The problem of rear tyre wear, too, received close attention. With the Miller engine fitted, wear is claimed to be no more than five per cent greater than it is on an unpowered bicycle. This has been achieved by using (a) as large a driving roller as practicable—that at present fitted is 82mm (3¼in) in diameter—to give the maximum contact area between the roller and tyre, and (b) by employing a form of cushioned drive. The outer toothed or serrated shell of the driving roller is of cast iron. Bonded within it, and providing resilience between it and the steel roller centre, is a heavy rubber bush, the purpose of which is to provide even torque transfer.

Yet another aim behind the design was to eliminate frame stresses when the unit is driving and the roller, therefore, is in contact with the tyre. In this case the entire driving stresses are taken by an adjustable stay attached at its forward end to the unit and at the rear to the wheel spindle. Movement of a hand lever through a form of bell crank lengthens or shortens the stay, thus moving the engine on the slides through which it is attached to the frame.

Technical details of the engine are interesting, and some most unusual. The crankcase is split vertically in the normal way and one of the halves, that on the left-hand side, incorporates a rearward extension for housing the A.C. generator and one of the countershaft bearings. The other bearing for the countershaft is housed in an outrigger truss bolted to the rear of the right-hand side half-crankcase. The truss is located by dowels during machining and held when in position by four crankcase through bolts.

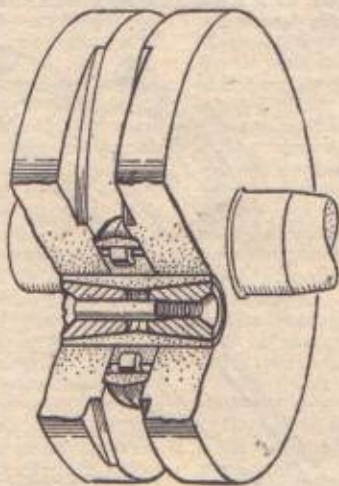
Dimensions of the main and countershaft ball-journal bearings are 1½in outside diameter, ¾in bore and ⅝in wide; all are fitted with synthetic-rubber oil seals. Forged steel internal flywheels and their mainshafts are made from the solid. Flywheel diameter is 3¼in.

Good-quality nickel-chrome steel is used for the crankpin, which is of unusual design—unusual in British eyes, at least. The pin is ground parallel, of ¾in diameter, and taper bored from each end. Into the tapers are inserted steel collets, or cones, one of which has a plain axial hole and the other a screwed hole. A long countersunk-head screw passes through them and holds them lightly. The length of the collets is such that when they are inserted in the crankpin they project the merest fraction beyond the ends. To assemble the flywheels the method is to press the crankpin lightly into each flywheel, line up the assembly—it is suggested that this may be done with a straight-edge—and grip the flywheels (across the crankpin) in a vice.

Crankpin Expansion

When the assembly is pulled up hard, the internal collets swell the crankpin to the desired interference fit in the flywheels. Removal of the screwed-hole collet merely entails slackening the centre screw and giving it a light tap. Then, of course, removal of the other is simply a matter of using a suitable drift through the crankpin.

Chrome-nickel steel is used for the forged



Steel cones, when pressed in, expand the taper-bored crankpin into its holes in the flywheels

connecting rod, which measures 3¼in between centres and runs on a roller-bearing big-end. The small-end is phosphor-bronze bushed and carries a fully floating, ¼in-diameter gudgeon pin, which is taper-bored for lightness and is located in the piston by wire circlips. Of Lo-Ex alloy, the piston is very long, is grooved to take three pegged compression rings and has two cutaways in the base of the skirt to give a long transfer "dwell."

Finned longitudinally, the cylinder is manufactured from special cast iron. It is deeply spigoted into the crankcase and incorporates inlet, transfer and exhaust passages and a cross pin for the forward engine mounting. At their top ends the transfer passages are bored diametrically, and screwed plugs with carefully profiled ends are inserted in such a way that they give an upward swirl to the fresh charge, thus assisting cylinder scavenging. The light-alloy cylinder head incorporates a hemispherical combustion chamber and screwed holes for the 14mm sparking plug and the compression release valve. Compression ratio is 5 to 1. Both the cylinder and head are held to the crankcase by means of four long studs and nuts. Lubrication is by petrol.

A.C. Generator

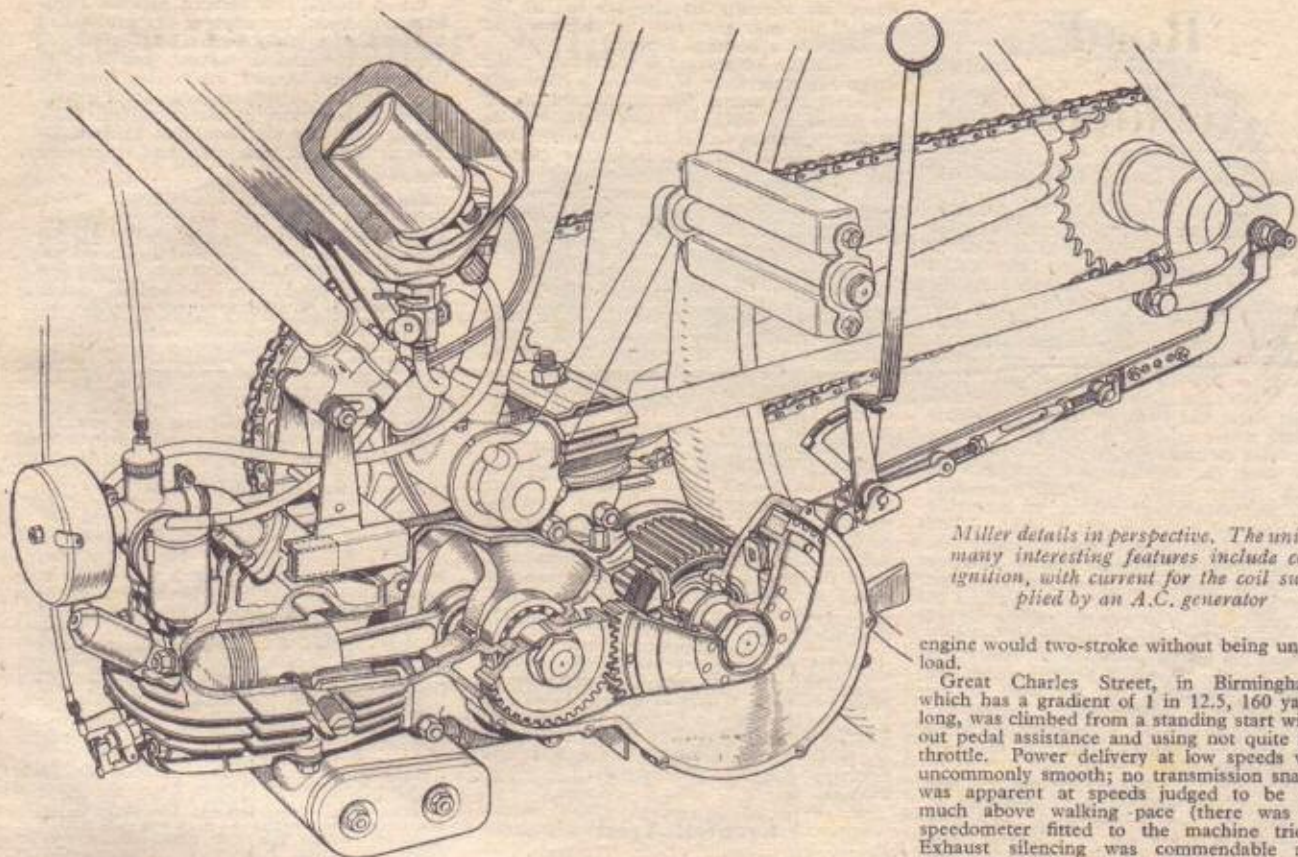
The carburettor is an Amal 308, with a 10mm choke diameter. The instrument is mounted on a long induction pipe and faces forward.

In the interests of compactness, the 9-watt A.C. generator was specially designed for this engine. Its total width is no greater than ¾in. In design and construction the unit is extremely simple. It comprises merely a four-coil stator, bolted to the crankcase, and a built-up, four-magnet, four-pole rotor of orthodox construction. Surrounding the steel centre is a bronze "flywheel," to the periphery of which is attached a non-magnetic toothed wheel. This latter is of a special material which looks like fibre.

Driven by a steel pinion on the mainshaft, the rotor runs at half-engine speed; it is keyed on a taper on the left end of the countershaft; the latter also supports the driving roller between the bearing journals. Full generator output is said to be available at 10 m.p.h. road speed. The generator energizes a high-tension ignition coil which, on the present models, is mounted on the cycle front down-tube, but which later will be mounted in a recess in the base of the five-pint fuel tank.

The contact-breaker is housed in the right-hand side half-crankcase. A simple internal cam is fitted in the hollow mainshaft—this so that the wiping area is as small as possible. Accessible and very simple adjustment of ignition timing and contact-breaker gap is provided by cam-action pegs which have screwdriver slots in their heads. It is merely necessary to slacken the fixing screws and rotate the cam by the desired amount. The contact-breaker is enclosed by a chromium-plated cover held by a simple spring clip.

Engine mounting is to the front down-tube and to the chain stays immediately behind the bottom bracket. Clamps are in light-alloy and suitable for fitting to machines with various widths between the tubes, various angles of tube to the horizontal, or angles to one another. Each bracket incorporates



Miller details in perspective. The unit's many interesting features include coil ignition, with current for the coil supplied by an A.C. generator

guide slots to allow the driving roller to be moved into contact with the tyre or away from it.

Ground clearance below the unit is 4in. Construction of the box-shape silencer is such that the sides are easily detachable for cleaning purposes. The fuel tank is rubber mounted to the front down-tube and forward engine clamp, and is located in the V of the frame. The only controls are those for the throttle and compression-release valve. Power output is given as 0.9 h.p. at 3,800 r.p.m., and the weight as 18lb.

A member of the staff of *The Motor Cycle* had the opportunity last week to try a Miller engine which was fitted to a Sun cycle with a standard 19in frame. Starting from cold or hot was found to be certain after four turns of the pedals. The physical effort involved in pedalling the bicycle, on level ground, when the driving roller was engaged and the compression-release valve opened, was thought not to be beyond the capabilities of an average 13- to 14-year-old girl. Two-stroking under light load was remarkably good; indeed, at medium revolutions the

engine would two-stroke without being under load.

Great Charles Street, in Birmingham, which has a gradient of 1 in 12.5, 160 yards long, was climbed from a standing start without pedal assistance and using not quite full throttle. Power delivery at low speeds was uncommonly smooth; no transmission snatch was apparent at speeds judged to be not much above walking pace (there was no speedometer fitted to the machine tried). Exhaust silencing was commendable and better than average for this type of engine. There was no vibration.

Ordinary clothes were worn during the trial, naturally. The engine remained clean externally. Generator output was sufficient at an estimated 10 to 12 m.p.h. to provide current for head and tail lights and to operate a lightweight electric horn which was audible at 60 feet.

The makers are H. Miller and Co., Ltd., Aston Brook Street, Birmingham, 6. Production is not expected to begin for several months and, as yet, there is no decision regarding price.

Monte Carlo Success

ALL enthusiasts will join in congratulating S. H. Allard for his achievement in obtaining first place in the Monte Carlo Rally. S. H. Allard, who drove his Allard car from Glasgow, was a keen motor cyclist in his younger days and is still prominently associated with the Streatham Club. His brother, D. J. Allard, often figures among the sidecar entries in sporting trials.

Among the competitors who started from Munich was A. R. Foster, well-known road racer and 350 c.c. World's Champion in 1950; accompanying him as co-driver was G. Holdsworth, who achieved fame in pre-war and early post-war years as a Royal Enfield trials rider. Foster's Jowett Javelin completed the route to Monte Carlo with a sufficiently low loss of marks to gain a place in the final 47-mile regularity test over ice-bound roads. During this run he was reported to have skidded into a snow bank while giving way to a Dyna-Panhard.

OLD-TIMERS who knew the Naval officers' trial, the Arbuthnot Trophy event, always enthuse about its unique character. There were no observers; the N.O.'s had to report their own foots and stops, and amusing reading their cards used to afford. At present, the Royal Navy has its place in the annual Services Trial, the excellent Civil Service Motoring Association event, but there is the suggestion that the Navy's own trial should be back in the calendar. It is thought

that if the Arbuthnot were reinstated and the rules such that it was open to ratings as well as officers, there would almost certainly be an adequate entry.

DENIS Parkinson's wife, Pat, gave birth to a baby daughter last week. The baby weighed 7lb 8oz and she and her mother are both doing well.

ON January 16, at Piacenza, Italy, U. Tamarozzi, riding a 48 c.c. Ducati, set up two world's records in the 50 c.c. class. These were the flying-start kilometre at 50 m.p.h., and the standing-start kilometre at 39½ m.p.h. On the same occasion, A. Bottigelli, riding a 74 c.c. Alpino, established a new record for the flying kilometre in both 75 c.c. and 100 c.c. classes at 80 m.p.h.

IN December of last year, 6,851 motor cycles, auto-cycles and three-wheelers, valued at £708,394, were exported. In the same period spare parts worth £140,431 were sent overseas. The figures for the whole year show that in 1951 the number of machines exported was no fewer than 91,699, compared with a total of 73,957 for 1950. The value of the 1951 exports was £9,299,041. The part played by British motor cycle manufacturers in making a major contribution to the export drive is of ever-increasing importance. As the Board of Trade figures show, in 1951 the number of motor cycles, auto-cycles and three-wheelers sent overseas reached new heights. In fact, the 1951 total is an all-time record.

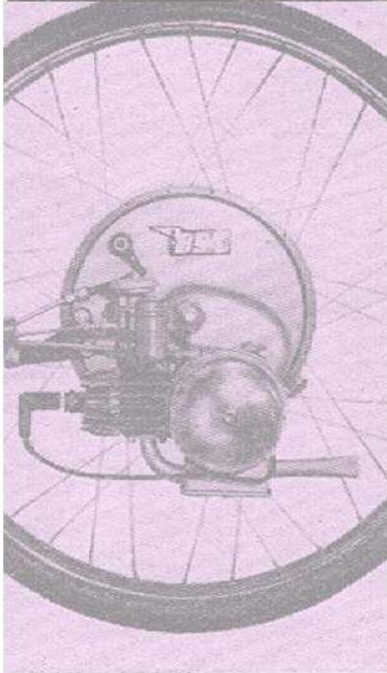
WITH effect from tomorrow, February 1, the price of the 499 c.c. Series "C" Vincent Comet will be raised by £7 to £219. Purchase Tax (applicable in Great Britain only) will be £60 16s 8d, making a total price of £279 16s 8d.

THIRD All-ranks Reunion of 18, 6 and 70 Div. Sigs., Special Force Sigs. (Chindits), S.F. Training Sigs. and 34 Ind. Corps Sigs., will take place in London on Saturday, March 1. Further details are available from Brig. F. R. W. Jameson, Standwell House, Oxsted, Surrey.

THE panel for the annual Vintage Brains Trust to be held on February 21 at the Crown Inn, Broad Street, Birmingham, will comprise Joe Craig, Ernie Nott, H. G. Tyrell Smith, H. Rem Fowler, J. H. Simpson, George Savage, E. R. Pethian, D. W. Munro, Bob Burgess, Bert Ker-shaw and possibly Vic Brittain and George Rowley. Chairman for the occasion will be Graham Walker. The quiz is due to begin at 8 p.m.

IT has been decided to extend the A.C.U. Trials Drivers' Star competition to include the Scottish Six Days' Trial and any national trials of more than one day's duration. A second method of deciding ties is also laid down, consisting of an assessment of the greatest aggregate of riders competed against by those tying. A further amendment to the rules is that there will be an increase in the points awarded to the sidecar winner of each national trial, from 20 per cent to 50 per cent of the number of sidecar entries, up to a maximum of 10 marks.

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