

THE J.E.S. LIGHTWEIGHT.

A Real Miniature with Mechanical Lubrication and Automatic Floatless Carburetter.

DIFFICULTIES in connection with obtaining houses within walking distance of works or office have added immensely to the already large demand for a genuine lightweight motor cycle. Many, especially those who are past the prime of life, are apt to turn from the obvious solution of the difficulty (the motor cycle) on account of the fact that motor cycles require special mechanical knowledge and are too heavy to move into the available storage space. It must be admitted that this argument has not

some detail, as many of them deserve the consideration of all those interested in motor cycles, whether lightweight or otherwise.

To begin with, the cylinder is a clean casting having a single valve pocket for both inlet and exhaust with a good air space between the pocket and cylinder walls. The inlet valve which is disposed above the exhaust is enclosed with its rocker in an aluminium casting forming part of the inlet pipe, and this unit is readily detachable by unscrewing a ring nut.

With regard to the volume swept by the piston, the engine has a bore and stroke of 55.56×60.3 mm. ($2\frac{1}{8} \times 2\frac{3}{8}$ in.) giving a piston displacement of 146 c.c.

A hollow gudgeon pin is fixed to the H section connecting rod and floats in chilled phosphor-bronze bushes carried in bosses in the light aluminium piston, and a very ingenious system of lubricating this important part is employed.

When the piston nears the bottom of its travel (i.e., when the crank case pressure is at its highest value) the hollow gudgeon pin uncovers ports in the cylinder walls. One of these ports is in constant communication with the crank case and the other with the timing case, and thence with the atmosphere. Consequently, crank case pressure release takes place through the gudgeon pin, and cool air and oil mist pass through at the bottom of every stroke.

An open-ended crank case houses the crankshaft, the end being closed by a cover plate carrying the crankshaft and outside flywheels. This plate is well registered in the casting, and is secured by screws. It should be mentioned that holes are drilled in the flywheel so that these screws are easy of access, and, in fact, the end plate and crankshaft can be removed in three minutes. From the above it will be gathered that the crank is of the single bearing overhung type, but a spigot on the end of the crank pin registers in a hole in a fly crank disc, which, in turn, drives the timing gear.

Combined with the crank case casting is an oil sump with a detachable cover plate, and an oil filler in a convenient position. In this sump lies a gear type oil pump, driven by a worm gear from the periphery of the fly crank disc.

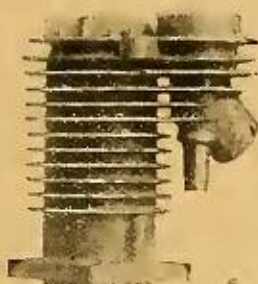


The J.E.S. lightweight motor cycle is on pedal cycle lines, but fitted with the motor attachment and spring forks.

The pump forces oil to a constant level trough in the crank case, and thence the working parts are oiled by splash feed. This system is very simple, and cannot get out of order, so that once the sump has been filled the rider is entirely relieved of lubrication worries until it becomes necessary to refill the sump.

Two special lugs on the crank case are used to clip the engine to the down tube of the frame, and a third lug is connected to the saddle tube by means of links, thus giving both engine and frame an extra point of support.

A special frame somewhat on the lines of a pedal cycle is employed, the pedal-

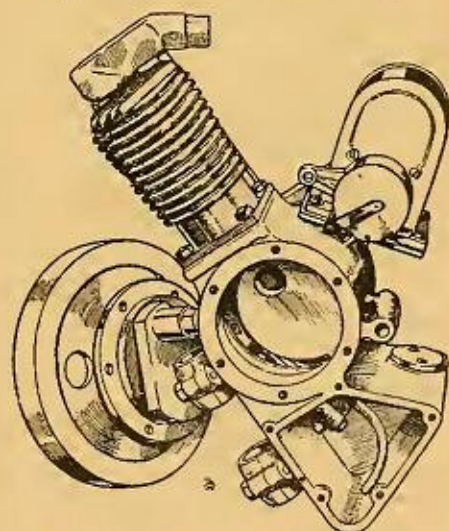


The cylinder of the J.E.S., showing air space between valve pocket and body of cylinder.

been without justification in past years, but the objections are being steadily removed by the present influx of light machines and cycle attachments.

Perhaps the lightest complete motor cycle at the present moment is the 1½ h.p. J.E.S., which weighs no more than 75 lb., and is designed throughout with the idea of producing a machine which is simple to handle and free from mechanical troubles.

Throughout the engine the most up-to-date practice is employed, and the workmanship is exceptionally fine. There are several very interesting features in the design with which we propose to deal in



Power unit with crank case cover removed. Observe the disc wheel, rotated by the crank pin, which operates the timing gear and oil pump.



J.E.S. auxiliary motor set for attachment to existing pedal cycles.

ling gear fitted to the bottom bracket in the usual manner. Final transmission from the engine is by Whittle belt. The frame is fitted with Druid type lightweight forks.

A most important feature which must not be forgotten is the floatless automatic carburetter. This is a most simple and ingenious piece of mechanism, and from our own observation, we can say that it functions admirably. This carburetter, though difficult to explain, is very simple in construction, and consists of the following parts.

The J.E.S. Lightweight.—

A body is connected to the inlet pipe petrol pipe having a small hole drilled from the petrol union to an inner conical seat. On this seat rests the correspondingly coned face of an inner barrel. This barrel is capable of rotation but not of vertical motion, and in the coned seat is a jet hole with a tapering groove, which registers with the hole already mentioned in the main body. The inner barrel also carries a snifting valve in the lower part.

Inside again lies a barrel throttle moving vertically and controlled by a Bowden cable. The throttle barrel, which is prevented from rotation by a fixing screw on the outside of the body, is con-

nected to the inner barrel by means of a boss moving in an inclined slot, thus when the throttle is raised so as to give more gas the barrel is slightly rotated and the groove controlling the petrol flow is enlarged, and at the same time increasing engine suction raises the snifting valve and allows more air to pass.

Mr. Smith gave us an extraordinary demonstration of a standard carburetter on test, and proved that even after a long run at dead slow speed the engine would respond instantly to throttle opening.

The J.E.S. engine set can be supplied for the conversion of a pedal cycle at twenty-three guineas, but it must be understood that slight structural altera-

tions to the frame will be necessary; the complete mount, with 26×1½ in. tyres, costs thirty-eight guineas.

Perhaps our one criticism of this practical little vehicle is that it follows cycle lines rather too closely from the point of view of appearance, and this may be answered by the fact that the extra weight and cost which would be necessary to replace the pedalling gear by a gear box or larger engine would spoil the proposition.

In conclusion, our readers should remember that the J.E.S. has ten years' experience to back it, and that the latest model is further advanced as regards power units than many larger machines.

A

56 lb. SCOOTER

55 × 60 mm. Four-stroke Engine with Overhead Valves and Detachable Head.

IT may be recalled that in our issue for June 5th, 1919, we illustrated and described the scooter built privately by Capt. Smith Clarke, of Kenilworth. The design of this machine has been adopted by Messrs. Booth Bros., of Bishop Street, Coventry, who will enter the scooter market immediately with the Kenilworth scooter.

Most of the features of the Smith Clarke have been retained, the modifications being merely the fitting of a four-stroke engine with mechanically-operated inlet valve in place of the old Clement engine used by Capt. Smith Clarke, and the adoption of smaller wheels.

Frame Construction.

Probably the frame design and construction is the simplest of any type of two-wheeled vehicle. There are very few brazed joints, and these are confined to the head and front fork. The frame may be said to consist of two steel plates,

six detachable tubes, and steering head. The last mentioned is a long tube having a lug at each end, which closely resembles the seat-pillar lug of a lady's pedal cycle. To these are fixed, by bolts, the six tubes connecting the head with the two steel plates forming the "chassis." These latter are connected by long bolts having tubular distance pieces.

The fork consists of two long tubes curved at the lower end, carried right up to the handle-bar and connected to the steering column by a long bolt.

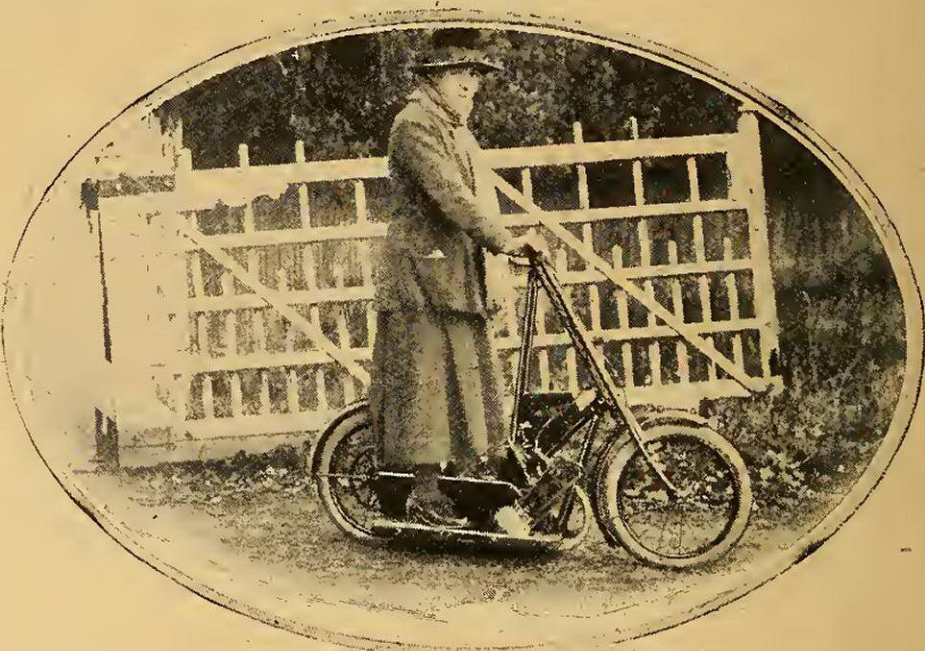
The Transmission.

On the outside of the right side plate of the frame the engine is attached by means of bolts, the flywheel being between the two plates and the magneto on the outside of the left plate. The flywheel carries a V pulley, from which the primary drive is taken to a countershaft by means of a ½ in. Whittle belt. This countershaft takes the form of a hub which is carried in slots in the plates for the purpose of chain and belt adjustment. From the countershaft the drive is by chain to the rear wheel.

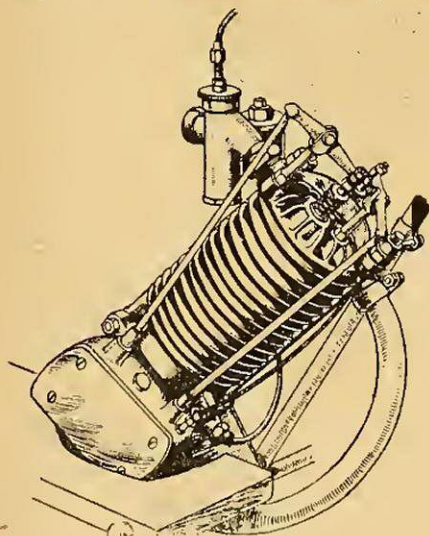
The engine is a neat little unit having a detachable head to its cast iron cylinder and an aluminium crank case. The push rods operating the overhead valves are

set at an angle, and are actuated by a single half-time wheel having two cams.

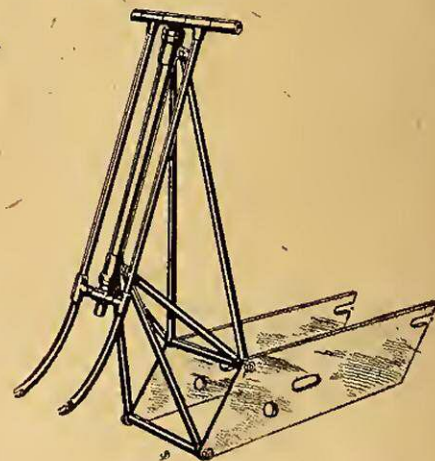
18 × 2 in. wheels, 4 in. mudguards amply valanced, single lever carburetter, Runbaken magneto and two brakes are included in the specification and the machine finished in all black. The price is forty-two guineas.



The Kenilworth scooter on the road.

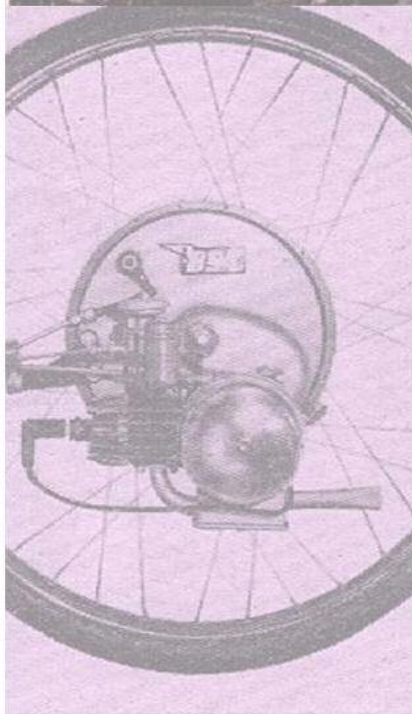


An overhead valve engine is fitted to the Kenilworth scooter.



No brazed joints are used except on the steering column.

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