Everyman's Mount —

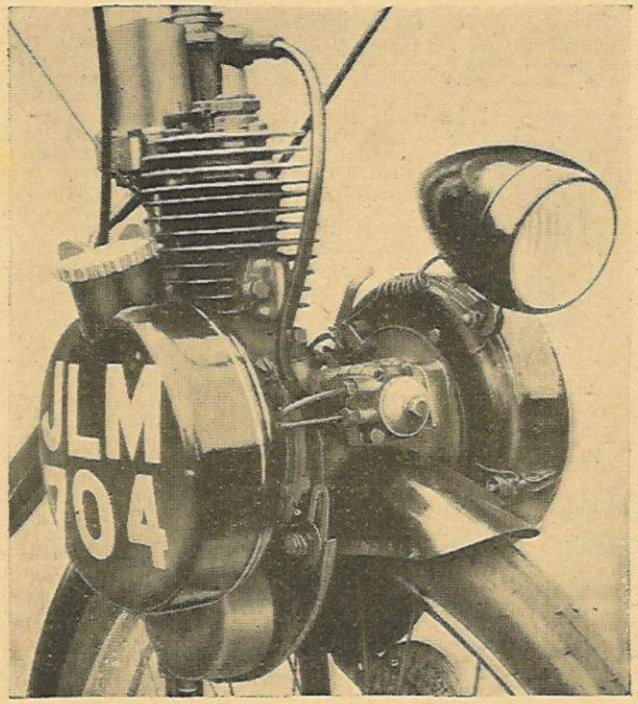
Experiences with the 45 c.c. Velosolex Power-cycle : A Practical

WELL over 10,000 Velosolex machines are in use in France. This little power-cycle was developed during the war and has been produced in increasing numbers since 1946. It was briefly described in *The Motor Cycle* of July 11th, 1946, and has been shown at the various Continental exhibitions. However, it is only in recent weeks that the opportunity has come my way to try one of these machines on British roads.

The Velosolex is in the power-cycle class of the Mosquito (tested last January) and other Continental models—particularly Italian—designed to appeal to the cyclist who wishes to reduce the labour of pushing pedals. However, it is marketed as a complete machine, and the engine is not intended for attachment to an ordinary cycle.

An open frame is used, but it differs in construction from the average British cycle frame in that the main tube has a diameter of 1⅜in and has two supports welded to the base of its curve which meet at the bottom bracket.

To accommodate the saddle pillar the main tube is "pinched-in" by four bolts, two fore and two aft. Channel-section members are used for the seat and chain stays. Taper tubes are employed for the front fork, which follows orthodox construction.



The power unit neatly straddles the front wheel

Tyres are 26 × 1½ × 1⅜in, and there are caliper brakes operated by cables from inverted levers on the handlebar.

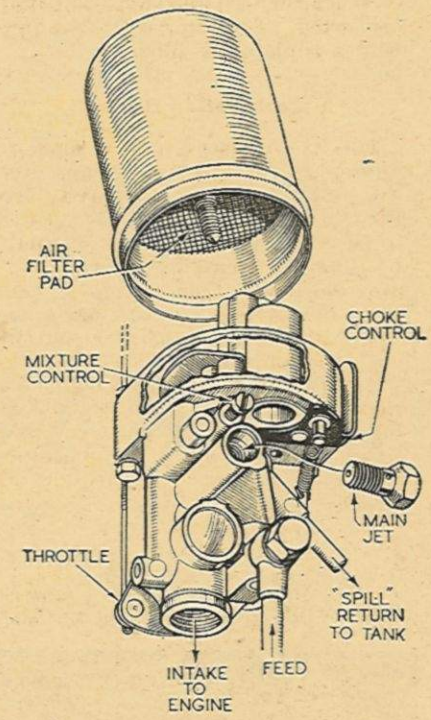
Segment-shape steel plates bolted to the front fork tubes carry the 45 c.c. two-stroke engine, complete with driving roller, flywheel magneto, and front lamp and fuel tank. The whole unit pivots from these plates; it is pushed forward after a locking catch is released to bring the roller into contact with the tyre, where it is held by two coil springs.

In effect, the power unit straddles the front wheel; on the offside of the roller is the engine, and outside this the cylindrical fuel tank; on the nearside is the flywheel magneto, equipped with lighting coils and fitted with a cover of the same shape as the fuel tank.

Overhung Crank

The engine crank is of the overhung type and carried by a large-diameter journal ball race which also forms one bearing for the driving roller. A semi-circular bobweight is bolted to the boss of the crank. On the peg-type crankpin there is a fully floating steel sleeve on which operates the phosphor-bronze bush in the big-end eye of the connecting rod. The hollow gudgeon pin is retained in the piston bosses by circlips. The piston is in light alloy, has a full skirt, a deflector crown and two compression rings; these rings are not located by pegs.

Four studs at the crankcase mouth retain the cast-iron cylinder in the orthodox manner. Two light-alloy manifolds are bolted to the cylinder. That at the front transfers the gas from the crankcase through a port in the piston and a port in the cylinder wall, up to the combustion chamber; the manifold is forked internally, so that the single inlet port becomes a double outlet and there are, of course, two upper ports in the cylinder wall. At the rear is the combined exhaust and inlet manifold.



The unique carburettor has no float chamber. Excess petroil supplied by the pump flows back to the tank

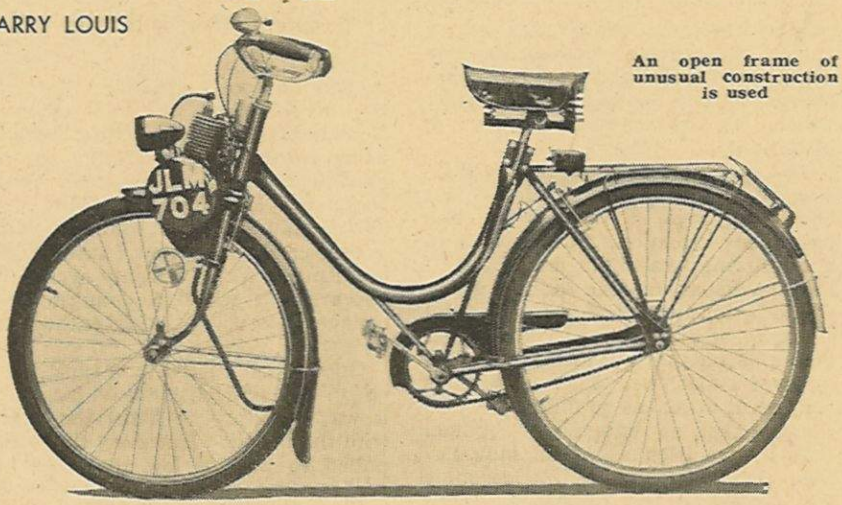
A pipe curved downward from the exhaust port in the manifold leads into a small cylindrical silencer bolted to the offside engine mounting plate, and from this silencer is a long tail pipe terminating at the flap on the front mudguard. Mounted vertically on the intake stub of the manifold is the special carburettor and air-filter.

The light-alloy cylinder head makes a spigot joint with the cylinder and is retained by three studs. A straightforward spring-loaded decompressor valve is fitted and the 14mm plug is positioned directly above the deflector of the piston.

Carburation details of this engine are especially interesting. Fitted on the

—A French Approach

Little Machine Popular in France By HARRY LOUIS



An open frame of unusual construction is used

light-alloy cover of the driving roller is a membrane pump. A drilling in the cover, which is part of the nearside half of the crankcase, connects the pump with the crankcase. By the action of the alternate changes in pressure in the crankcase, the membrane pulsates and passes petrol from the tank up to the carburettor. There are, of course, simple ball valves in the ducts at the back of the pump unions, to which the feed and supply pipes are connected. The pump is also equipped with a triple gauze filter.

Carburettor Details

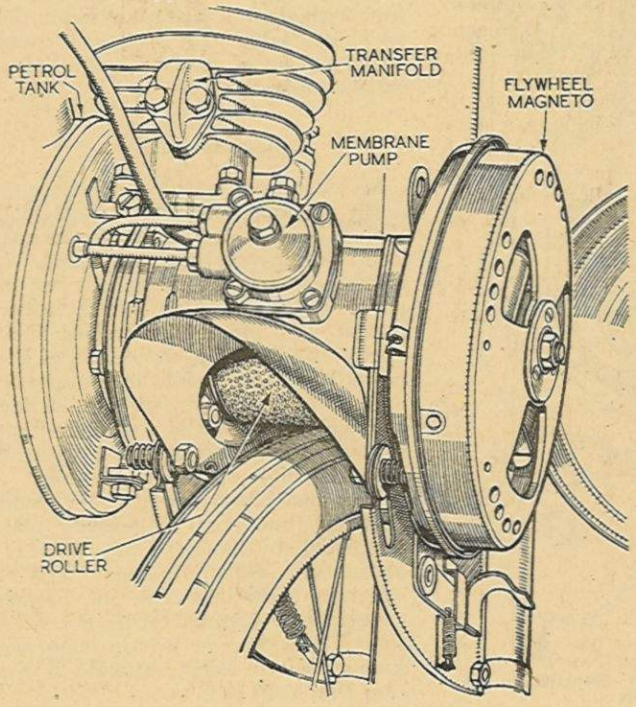
Fuel is supplied up to a small reservoir in the carburettor, and from this reservoir there is a gravity feed back to the tank. From the duct up to the reservoir a quantity of fuel is by-passed, metered by a jet, and fed into the down-draught mixing chamber. Below the fuel feed, that is, between the mixing chamber and the engine, is a cylindrical throttle valve.

Air is admitted through a cylindrical silencer-cum-filter on top of the carburettor. A simple choke is fitted which, when brought into operation for cold starting, restricts the air intake.

It will be appreciated that this type of carburettor is of extreme simplicity; it eliminates all the usual float components and requires no mechanism in the carburettor for metering the fuel supply in proportion to the throttle opening. Precise tuning for mixture strength is provided by a mixture control screw (which influences only the air supply), but once this is set no further adjustment is necessary.

Though the fuel supply from the pump is automatically varied with engine speed, the carburettor is essentially a single-speed instrument and would not be ideal on the more usual type of power unit. As will be explained later, the engine is normally operated on full throttle; indeed, the throttle valve is spring loaded in the fully open position.

The drive roller is directly connected to the crankshaft and runs at engine speed. The bearing face of the roller is a rough-face composite material, but free from grooves or other regular indentations to provide tyre grip. On the near side, and, of course, running at roller and thus engine speed, is a flywheel magneto of usual design, fitted with lighting coils.



On the roller housing is the membrane pump actuated by crankcase pressure. The driving roller is of a rough-surface composition material; roller slip could not be provoked

One Control

Only one control is fitted. This takes the form of a trigger on the inside of the handlebar bend at the offside. A control rod from this trigger is connected to a triangular plate on the throttle-valve spindle. From this plate is a second control rod which actuates the decompressor.

As mentioned earlier, the throttle is kept on full bore by a spring. To close the throttle one pulls the trigger towards the handlebar and the adjustment of the rod linkage is such that the final movement of the trigger brings into operation the decompressor.

Absolute simplicity has been achieved. There is no tap to turn on and no messy flooding to worry about before starting. When the engine is cold one pushes the little lever over to bring the choke into operation, grasps the trigger to the handlebar, and pedals off. As soon as the trigger is released the engine fires and almost immediately the choke can be opened. Starting proved to be outstandingly

Everyman's Mount—A French Approach

easy whether the engine was hot or cold. The machine has an average cycle pedal ratio and could be propelled without appreciable exertion when the decompressor was in operation.

The quietness of the power unit s abnormal. I must confess that when, in 1946, the Velosolex first caught my attention, I had visions of a spluttering two-stroke just ahead of the handlebar making noises which would seriously detract from the practicability of the layout. I have never before been so far out in my pre-judgment of a machine. The engine is as near silent as makes no difference, and the exhaust so effectively subdued that I have been asked on innumerable occasions whether the machine was powered by electricity. The intake silencer suppresses any blow-back that might occur and the engine two-strokes remarkably well. I do not know the precise reasons why this little engine is so well-mannered—it is, so far as I can recall, the best engine in this respect that I have encountered—but I anticipate that the reason is almost entirely associated with the design, which is obviously aimed at achieving usable performance with a pedal-cycle.

Usable Performance

The question of usable performance is an important point easily overlooked with machines of this type. In the evolution of autocycles it has been found that if the habitual speed used is to be in excess of about 15 m.p.h., then pedal-cycle standards of suspension, tyre size, saddle and brakes are not good enough. A designer of a motor-assisted cycle is therefore wise if he designs the engine for the usable performance with a cycle in its simple form. The Velosolex meets this requirement admirably.

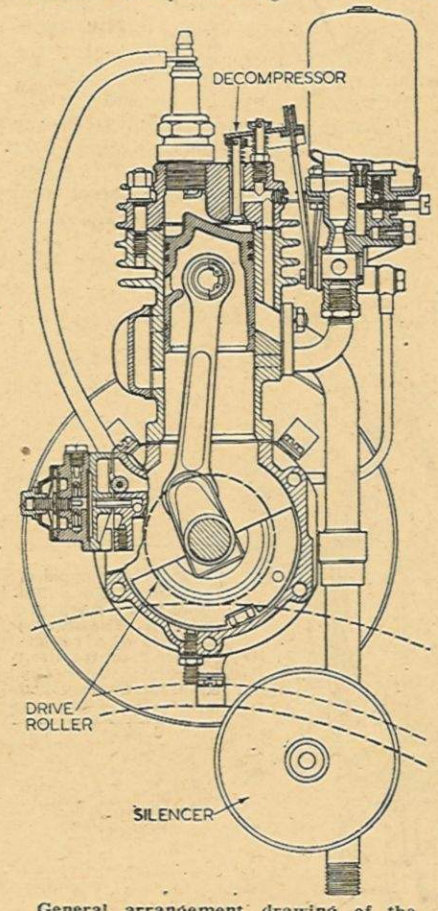
On a level road under average give-and-take conditions the maximum speed—the speed normally used bearing in mind the throttle control arrangement—was about 14 m.p.h., which represents approximately 2,200 r.p.m. A little more speed, up to around 17 m.p.h., could be achieved under very favourable conditions. The engine is thus of the relatively slow-revving type and, as might be expected, it pulls especially well at low engine revs. It would continue to pull unfalteringly when throttled down till the machine was travelling at a slow walking pace; and, indeed, even slower, till every power stroke could be felt through the frame.

On the type of journeys for which the Velosolex is intended, such as to and from work or on shopping expeditions, the performance is all that could be desired. I usually found myself travelling at the speeds of youngish cyclists on sports machines, but with the advantage of no pedal exertion. Acceleration was satisfactory, without being in any way sparkling—in the relative sense, of course—and power adequate for average hills. An average hill is difficult to define, but a fair description of what I mean is the gradient for which a utility cyclist dismounts, but which a youngster will conquer by using much enthusiastic energy.

On steeper hills of the type where 99 per cent of cyclists would dismount, it was necessary to assist the engine with the pedals. However, the engine pulled so well at low revs that one could pedal easily at a comfortable gait of about a depression a second and keep going for a long while without fatigue.

In this way, the 1-in-8 Anerley Hill, Crystal Palace, London, which is about 200 yards long, was climbed without undue effort. Other hills in the area not so severe were surmounted with varying spasms of pedal assistance, but in a morning of hill-climbing in the area I became convinced that the Velosolex was a thoroughly sound proposition for use on journeys which involved a very high proportion of main-road hills.

That morning of tests, and some miles preceding it, constituted my petrol consumption check. The figure obtained was about 245 m.p.g., which would no doubt be improved with less arduous conditions.



General arrangement drawing of the engine

In Traffic

It should not be inferred that the unique carburettor fitted made low-speed control, such as is required for heavy traffic, in any way difficult. The throttle trigger could be held in any desired position with sufficient steadiness for the flexible power available, and, as implied earlier, the machine could be pedalled with the utmost ease when the decompressor was brought into operation. Manœuvring in a traffic jam was as simple as with a normal pedal-cycle. The weight of the engine over the front wheel did not make the steering heavy.

Wet weather was experienced, yet there was never the slightest trace of drive roller slip. All attempts to provoke slip by using extreme methods and even by abuse, failed. There is no doubt whatever that the friction drive on the Velosolex is as effective as a positive drive could be.

Total weight of the machine under test (with about a pint of petroil in the tank) was 52lb. If necessary, it could be used as a normal cycle quite satisfactorily.

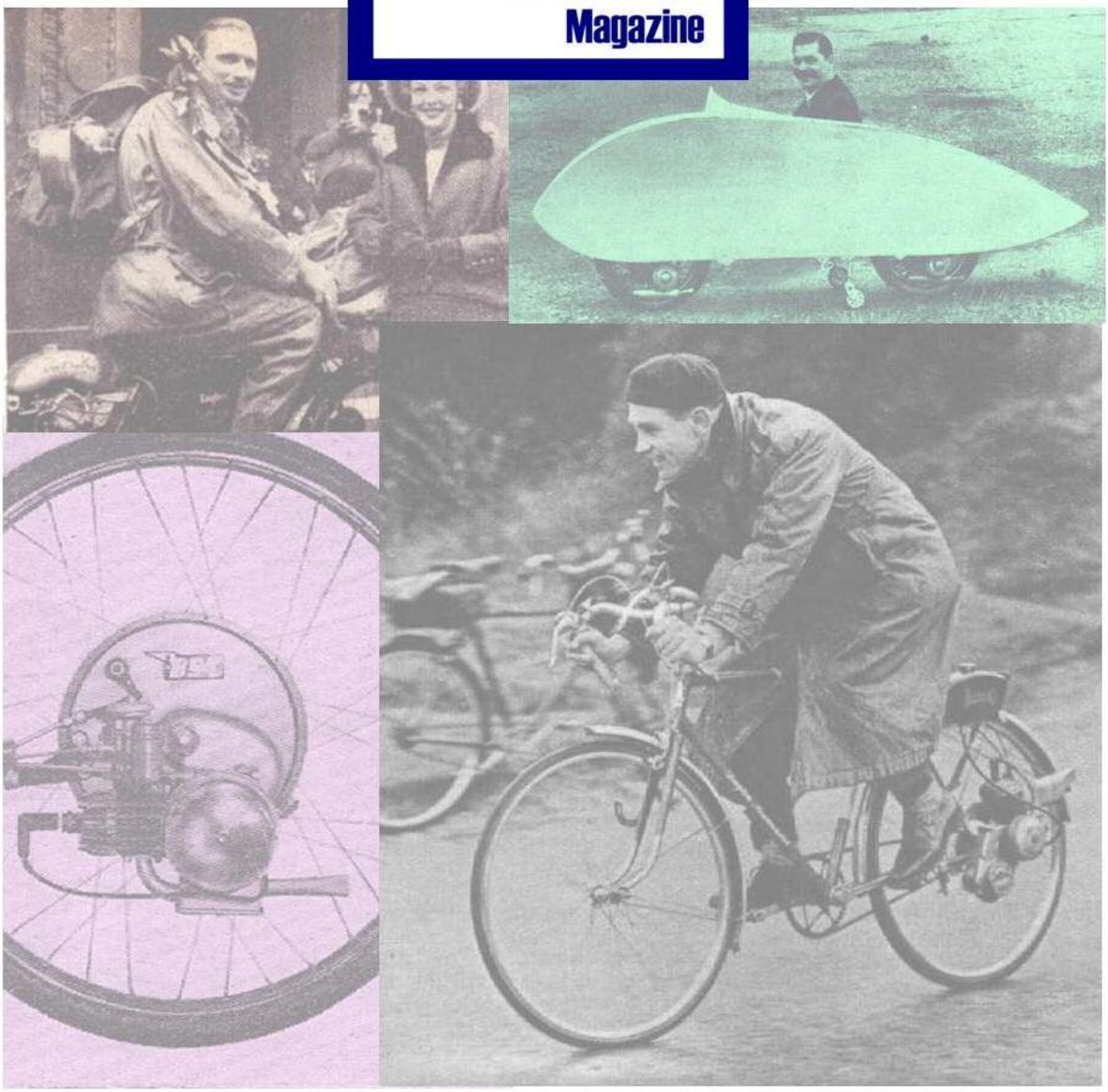
Functional Machine

My conclusion is that the Velosolex is an admirable little machine which scores heavily by being functional. Too much has not been attempted. It is designed to take the labour out of pedal-cycling and to have a utility appeal. It meets that requirement very well. Further, the design of the power unit, with its low engine speeds, and the standard of production achieved, suggest it is a machine that would give very long service with an absolute minimum of maintenance.

The machine is not made in Great Britain. Production is, however, contemplated by Solex, Ltd., 223-231, Marylebone Road, London, N.W.1, which is associated with the French concern now manufacturing the Velosolex. The price in Britain is not yet known, but a rough estimate is £30 plus Purchase Tax.

IceniCAM
Information Service

The Iceni CAM
Cyclemotor Autocycle & Moped
Magazine



www.icenicam.org.uk