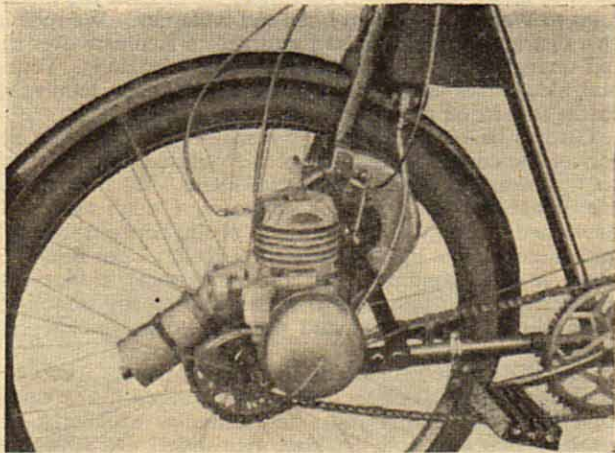


Home-built Cyclemotor

Successful Unit with Chain Drive Built by a Scottish Engineer



The home-built 51 c.c. two-stroke cyclemotor in position on Mr. Watt's bicycle. Transmission is by chain via a countershaft

In his backyard workshop, Angus Watt, of Inverurie, Aberdeenshire, has built a very professional looking 51 c.c. cyclemotor two-stroke unit. Mr. Watt is a turner and fitter in a locomotive works. His equipment comprised only an old 3½in screw-cutting lathe, a breast-drill mounted on a stand, and a grinder driven by a sewing machine treadle.

Bore and stroke of the engine are 1½ × 1½in respectively, giving a capacity of 51 c.c. The crankshaft is of built-up design with bob-weighted cheeks; the crankpin is secured by taper cotter pins riveted in position. Each mainshaft is carried in a ball race, with an outboard phosphor-bronze bush to effect oil-sealing.

Both big and little ends of the steel connecting rod are case-hardened to obviate the use of bushes. The big-end rollers (made from steel knitting needles!) run uncaged in the eye and on the hardened crankpin. The gudgeon pin is also case-hardened; all hardening was done at home with the aid of Kasenit compound.

Pressed-in Liner

The crankcase halves, the cylinder head and the barrel are aluminium castings; they were cast by a local jobbing foundry from patterns made by Mr. Watt. The barrel has a pressed-in, cast-iron liner which was lapped to size in the lathe and polished. The piston is also of cast iron. A decompressor is fitted to the cylinder head to facilitate starting.

Transmission to the rear wheel of the cycle is in two stages via a countershaft. At present both stages are by chain, but Mr. Watt is considering converting the primary drive to vee-belt, in the interests of silence and flexibility. The small sprockets are home-made, while the large sprockets are ordinary bicycle chain wheels, suitably modified. The clutch is of simple, three-plate construction.

An unusual and highly practical feature of the layout is that the engine drives through a standard three-speed Sturmey-Archer rear hub. This is done by adapting the bicycle free-wheel so that both it and the final-drive sprocket can be accommodated on the screwed portion of the hub, this without disturbing the original pedal chain line.

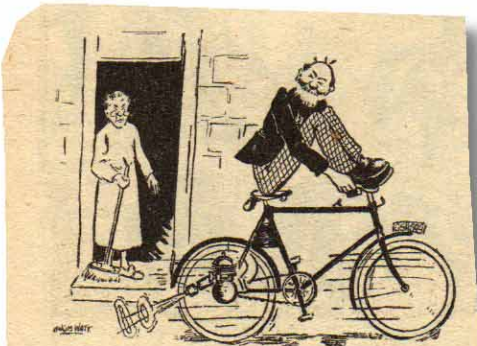
Ignition is provided by a Wico-Pacy Bantamag. An Amal Type 308 carburettor supplies the mixture. Fuel is carried in a tank shaped to fit between the frame tubes below the saddle.

To enable the engine to be mounted near the rear-wheel hub, the right-hand chain and seat stays of the frame were cut off at about mid-position and mild-steel lugs were brazed into the ends of the tubes. These lugs pick up on a triangular bracket, fabricated from mild-steel plate, to which the engine and countershaft assembly are bolted. The bracket thus forms the rear frame on the right side, and it is slotted to take the rear-

wheel spindle. A guard made from an old aluminium kettle is fitted over the forward rim of the clutch sprocket to prevent clothing from getting caught up in it.

Handlebar controls comprise the three-speed control lever, throttle lever and push-button decompressor. Mounted on the top-tube of the frame, the clutch control can be retained in the disengaged position should engine trouble necessitate pedalling.

Mr. Watt states that the engine has been in regular use for nearly a year, during which period it has covered about 1,000 miles with practically no trouble and has conveyed his 14½ stone up quite steep hills without pedal assistance. Gear-changing is done by closing the throttle, moving the lever to the next gear position and reopening the throttle; selection presents no difficulty.



Self-portrait drawn by Angus Watt