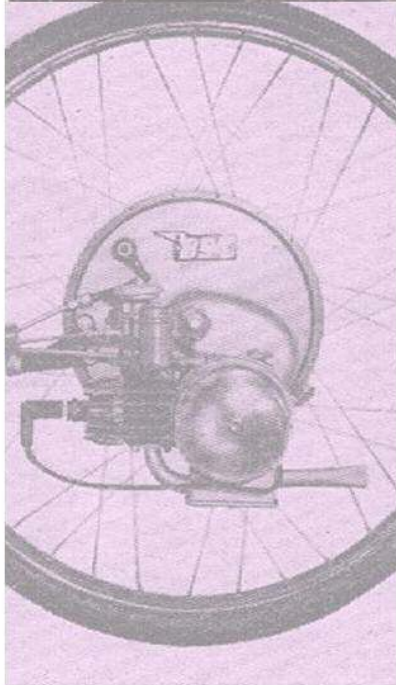


# IceniCAM Information Service



[www.icenicam.org.uk](http://www.icenicam.org.uk)

## The "BANTAMOTO" CYCLE UNIT

### 38 c.c. Auxiliary Two-stroke Engine with Gear Trans- mission

PIONEERS of the strictly utility type of motorcycle, which is now very popular under the generic title of autocycle, are the manufacturers of the latest motor attachment for pedal cycles, and they are sufficiently well known to ensure that any product of theirs is worthy of close attention.

This concern, Cyc Auto Works, Ltd., Brunel Road, East Acton, London, W.3, have recently placed upon the market a 38 c.c. two-stroke cyclemotor unit called the "Bantamoto," a novel feature of which is that the transmission is conveyed to the rear wheel by means of gears, the engine being mounted outside the frame in juxtaposition to the rear hub. The price of the unit is £21.

A simple two-stroke, the engine has a deflector piston and a bore and stroke of 38 mm. by 34 mm. respectively. Both the cylinder and detachable cylinder head are made in L33 aluminium silicon alloy, the former being fitted with a cast-iron-liner and the latter secured by means of four  $\frac{1}{16}$ -in. studs which pass right down, through the barrel, into the crankcase, which is also in light alloy. An expansion chamber fabricated from pressings is bolted direct by studs to the cylinder and is fitted with three baffles. Close beside, and below, the exhaust system is mounted a 308/3 Amal single-lever carburetter, clip-mounted to a spigot forming part of the internally cast induction tract. The inward end of this tract opens out into the periphery of a circular, phosphor-bronze-lined chamber formed in the boss of the off-side half of the crankcase. Turning inside this chamber is a steel sleeve which serves as a rotary valve, and

which is rotated by means of a dog in the end of the crankshaft. At the appropriate moment during the induction period the port in the valve registers with that in the chamber to permit the passage of gas into the crankcase. The crankshaft, on the rotary-valve side, is  $\frac{5}{16}$ -in. long and is supported in a single-row ball-bearing.

On the other side the shaft is extended to carry the first of the transmission driving gears and then further extended to support the Wipac flywheel magneto. Like its fellow on the opposite side, this half of the crankshaft is carried in ball bearings.

The crankpin, of 15.4 mm. diameter, is secured into the off-side bob-weight by a key, the connecting-rod big-end being of the plain, bronze-bushed type.

The transmission driving pinions are manufactured from 2 per cent. nickel-chrome steel.

A hollow layshaft carries a 53-tooth gear which engages with a smaller one on the crankshaft. Integral with the larger pinion is a 22-tooth pinion which, in turn, mates with a 55-tooth wheel keyed to a shaft extended to the outside of the transmission chamber. The

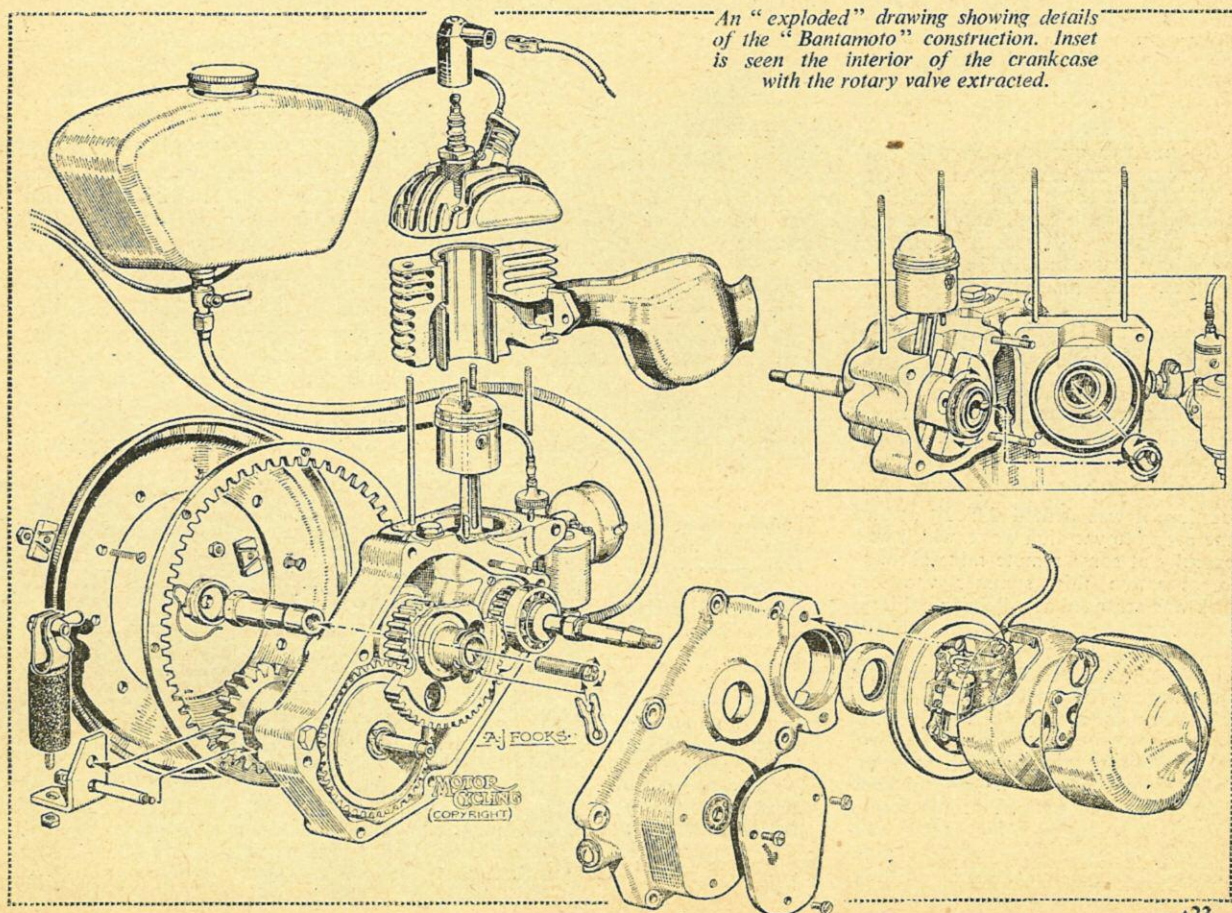
latter is cast in one with the outer crankcase half and forms a very neat assembly. The final drive is taken from a 20-tooth open pinion to a gear ring having 63 internal teeth.

The ring is bolted to a drum clipped to the rear wheel spokes by means of small but substantial clamps which are so arranged that they grip the spokes where these are laced. The overall gear-ratio between the crankshaft and the wheel is 26 to 1.

Not the least interesting detail of the "Bantamoto" design is the method by means of which the motor is attached to the rear wheel of the cycle. A locking collar is fitted over the rear wheel spindle on the inner side in place of the original spindle-nut, which is removed. A spigot on the collar fits snugly into the slot in the rear fork, this locating the collar and preventing it from turning. A case-hardened, mild-steel tubular unit is then screwed on to the spindle, following the collar, and tightened up, a circlip being employed to prevent the extension thus formed working loose. The motor-unit itself is mounted on the extension which passes through the hollow layshaft, an adjustment being provided to take up play. Into the end of the adjuster is fitted a spring clip, not unlike that used to retain the removable link in a cycle chain.

The motor unit is then capable of rotating on the extension, but is held in position by a shock absorber clipped to the nearside chain-stay of the cycle at the top and held at the bottom by a bracket angle fitted to the forward,

(Continued on page 513)



An "exploded" drawing showing details of the "Bantamoto" construction. Inset is seen the interior of the crankcase with the rotary valve extracted.

# MOTO-CROSS

collecting more parts, mostly postal deals, until the end of term. This allowed five weeks until the boat sailed for Belgium. In due time the motor was built up. The "Tiger 100" crankcase and crankshaft being left standard and, except for the mainshaft timing pinion, pistons and valves, the rest of the engine was entirely "generator." Incidentally, the oil pump is of the G.P. type and the cams appear to be "Speed Twin," as are the con-rods.

"Hepolite" slipper pistons giving a 9:1 c.r. for petrol-benzole were fitted, the combined weight of these being comfortably within 1½ oz. of the originals. Inlet ports and manifolds I opened out to 1-in. dia., and 1⅞-in. inlet valves were fitted. Exhaust valves were left standard at 1⅞-in. dia.

## Sparks and Gas

The B.T.H. magneto was sealed and fitted with a breather; the ignition I arbitrarily retarded 1/32-in. owing to the higher compression being used. Carburation was, and still is, looked after by an Amal Model 6 instrument with a 6/4 slide, .109 needle jet, and a main jet around the 180 mark.

I made engine plates from ¼-in. dural, the shaping being done by drilling and filing. Bolt holes were drilled 1/64-in. o.s. and high-tensile steel bolts with B.S.F. threads were made and fitted. The plates bolted up pretty well, though two holes needed opening up, and one plate contour was altered.

The gearbox was then fitted, the engine plate stiffener was made by trial and error, and the rear frame bolted on. Now I found that the head of the swinging-arm pivot had to be reduced in size considerably, due to lack of clearance between it and the back of the k/s case. Total gearbox movement was ⅜-in., equivalent to 1½ links of the ½-in. pitch primary chain. Internal box ratios were 1, 1.3, 1.67 and 2.14, giving a bottom gear of 15.6 and a top of 7.4—equivalent to about 70 m.p.h. at 6,000 r.p.m.

## Final Details

The primary chaincase was then fitted. The trough for the dynamo was cut off and a plate welded on. This was cut to the profile of a Triumph case and drilled to bolt up normally to the chaincase. Original "inner-fitting" footrests and their supporting square-section bar were scrapped and a ½-in. dia. high-tensile steel round bar substituted, and fabricated footrests bolted externally to frame.

A Triumph 3HW oil tank cost me 2s. 6d., and was fitted, together with a full-flow oil filter. The front saddle mountings were made of ⅝-in. dural, suitably bent, and a 1½-gallon petrol tank altered and put into position.

Original W.D. "teles." called for modification—a light alloy crown, whilst the fork springs were packed to give stiffness, and S.A.E. 30 oil used for damping. A 21-in. rim was built on to an ex-W.D. G3 hub with 7-in. dia. brake drum. As time was short, a new 1948-type brake plate was bought. The rear wheel, ex-W.D. Triumph, had a WM3

rim, standard spokes and 50T by ¼ in. sprocket.

"Snake charming" for the two-into-one exhaust system was done by E. Etheridge, of Bayswater. And that just about completed the work. I was very lucky to have the help of a Watford enthusiast, Basil Sargent, in the late stages; he helped in all the finishing jobs, such as the making of oil pipes, which always take the amateur such ages; he also took the photographs accompanying this article. All the welding work goes to the credit of another scrambler, Fred Johnson, of Croxley Green, Herts: the wheels were built by Bob Foster, of L.E.F. fame. The rest of the fitting was accomplished with normal hand tools, plus an electric drill and grinder.

Somehow the model was finished in time, and my wife and I set off for Belgium at 10 p.m. to catch the 8 a.m. boat at Dover. We know the waiting-room at Dover Station pretty well in consequence! Transport consisted of "Mrs. Frequently," an ever-willing 1935 A.J.S. big-twin combination, with the scrambler (registered as a 498 D.V.S., but known in the family as "Thunderbox 1") on a trailer behind.

Despite its untried nature, the D.V.S. never missed a beat, and achieved 10th place in its first Moto-Cross event—largely due to a mass of retirements. The only trouble to date has been a broken chain.

In retrospect, I feel I have learned to save time by drawing, or sketching, parts first, rather than using cut-and-try methods. It may help others if I say, too, that it is surprising how many good used parts can be bought, without preview, through the post. My total outlay was about £120, plus a good many hours' enjoyable planning and work; and much of that sum has been recovered subsequently in the form of prize and starting money which, in Belgium, is always good.

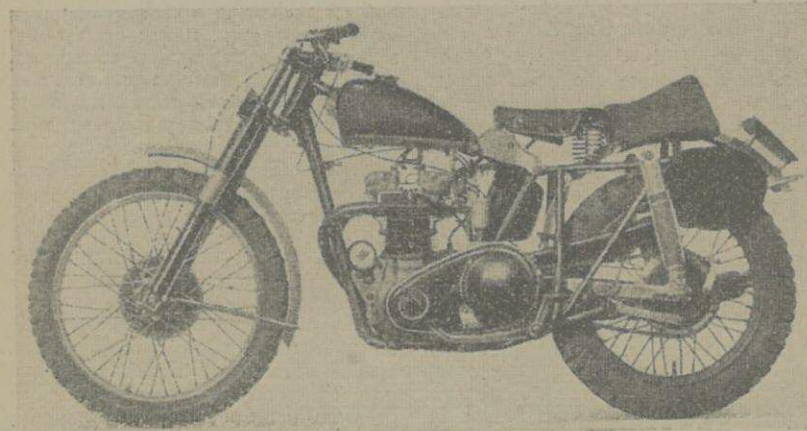
## THE "BANTAMOTO" —Contd.

lower end of the transmission casing. The mesh and alignment of the final-drive gears can be set to the correct position by altering the adjuster which moves the motor-unit longitudinally along its mounting. If required, further alteration of the adjustment will draw the final pinion completely out of engagement with the internally toothed ring, enabling the machine to be pedalled as an ordinary cycle. A major feature of the shock absorber is the rubber fitted between the frame clip and the lower bracket.

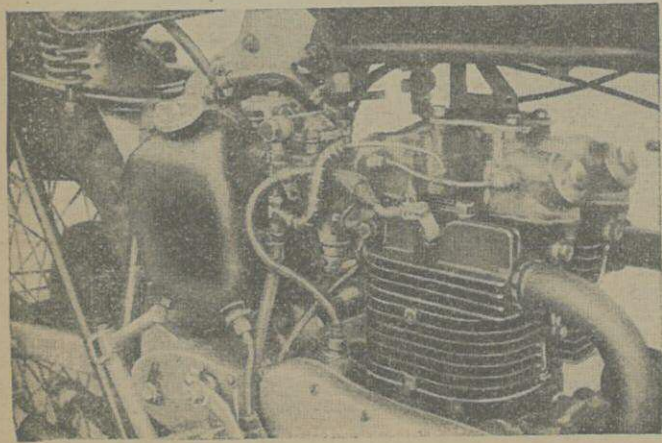
The engine is lubricated on the petrol system, but a small amount of oil is carried in the bottom of the transmission casing to lubricate the gears, a level and filler plug being fitted.

Mounted above the engine is a two-pint petrol tank, connecting to the carburettor with a flexible pipe.

Further details of the construction of the unit, which weighs 16 lb., can be obtained by glancing at the accompanying sketches. It is claimed that a speed of 15 miles an hour can be reached, while fuel consumption is said to be in the neighbourhood of 250 m.p.g.



(Above) Truly "bitza," the machine nevertheless has potency in appearance and performance.



(Left) Once a charging engine! With modified Hepolite pistons giving a 9:1 c.r. the unit now fulfils higher ambition.