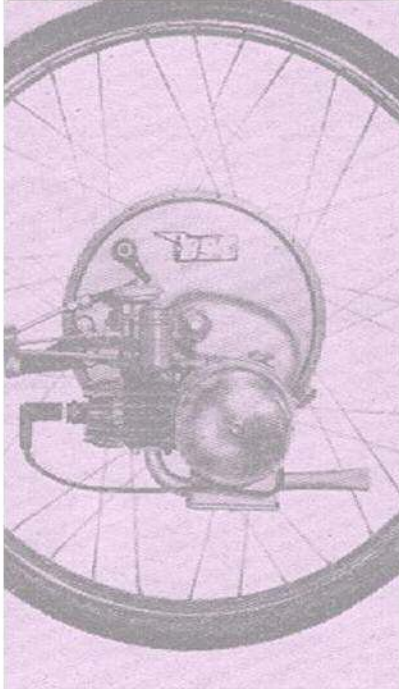
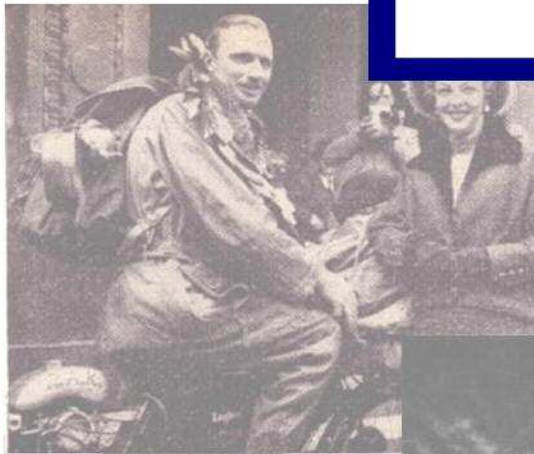
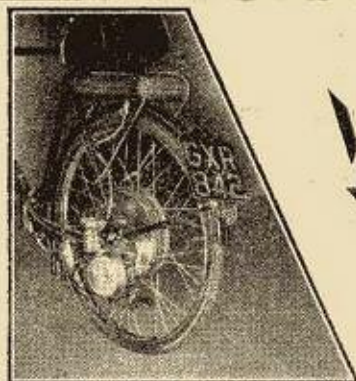


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Servicing the



WINGED WHEEL

THE 35 c.c. Winged Wheel cyclomotor unit is, of course, housed in the rear wheel fork of a bicycle—or in one of the specially made bicycles. Ordinary decarbonising of the engine and exhaust system is necessary roughly every 1,500 miles, depending on the type of work the engine has to do. Instructions for this work are explained in the ordinary handbook, and those that follow are for a more detailed overhaul.

Dismantling Procedure

Detach the complete wheel from the frame and remove the engine unit from the brake drum.

Reverse the engine unit and secure the right-hand side of the spindle in a vice. Remove the magneto flywheel domed cover and the flywheel central retaining nut. The magneto flywheel can then be withdrawn from its taper using suitable extractor (Fig. 2). Make sure that the small locating key is not lost. Withdraw the contact breaker cam from the mainshaft, again ensuring that the small key is not mislaid. Removal of the two large screws from their slotted holes in the magneto

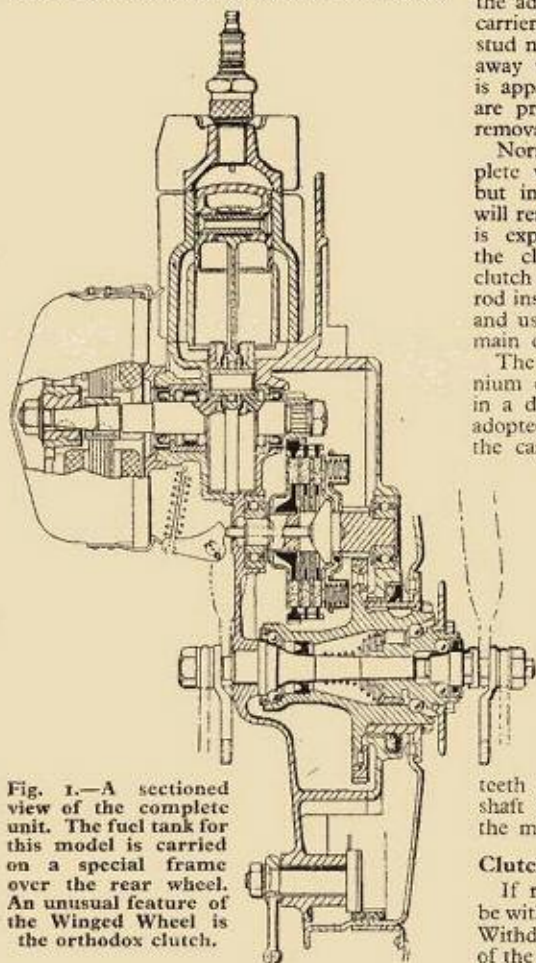


Fig. 1.—A sectioned view of the complete unit. The fuel tank for this model is carried on a special frame over the rear wheel. An unusual feature of the Winged Wheel is the orthodox clutch.

Overhaul Instructions for a Popular 35 c.c. Cyclomotor Unit: Engine, Clutch and Gearcase Dismantling and Re- building Instructions

backplate will permit this component to be removed.

If a vice is not used to support the engine unit, care should be taken to ensure that it is not allowed to fall on to the mainshaft, or the flywheel assembly will almost certainly be damaged. The exhaust system, cylinder head, cylinder barrel and piston should now be removed.

Gearcase Dismantling

Remove the unit from the vice and replace it so that the gearcase is uppermost. Undo the adjuster cone and withdraw the sprocket carrier. Remove the nine gear-cover plate stud nuts; the cover plate should then come away without difficulty, but if any stiffness is apparent, then the two projections which are provided on the outer cover will assist removal.

Normally the cover will come away complete with the clutch shaft and hub shell, but in some instances the clutch assembly will remain in the main case. If any difficulty is experienced in removing the assembly, the clutch push rod operating lever and clutch push rod should be removed, a $\frac{3}{16}$ in. rod inserted through the clutch push rod hole and used to drive the clutch shaft out of the main case.

The removal of bearings from the aluminium case is facilitated by heating the case in a degreaser, and this procedure must be adopted if a bearing appears to be tight in the case. In cases where the clutch shaft bearings are left in the case after the clutch shaft has been withdrawn, the case must be thoroughly warmed and the bearings dropped out by gently tapping the case against a wooden bench. If a degreaser is not available, the case should be heated by means of rags soaked in boiling water or by immersion in boiling water.

Push back the locking washer on the mainshaft nut and undo the nut using a box spanner, and preventing the flywheels from turning by wedging a screwdriver in the teeth of the mainshaft pinion. The mainshaft pinion can then be withdrawn from the mainshaft.

Clutch Dismantling

If required, the clutch assembly can first be withdrawn from the gearcase outer cover. Withdraw the ballrace from the push rod end of the clutch shaft by means of an extractor

and remove the washer in front of the circlip. Insert the clutch push rod, or other similar length of $\frac{3}{16}$ in. rod, into the push rod hole in the shaft and clamp the assembly in a soft-jawed vice, as shown in Fig. 3, until the clutch springs are fully compressed. Using a suitable pair of circlip pliers, remove the clutch retaining circlip and then pull off the thin washer behind the circlip. Undo the

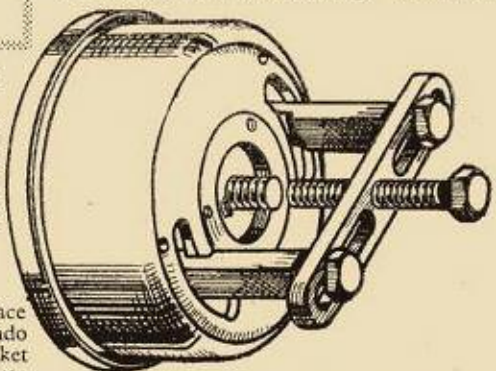


Fig. 2.—Removing the flywheel using a special extractor tool.

vice and remove the clutch gearwheel and clutch plates.

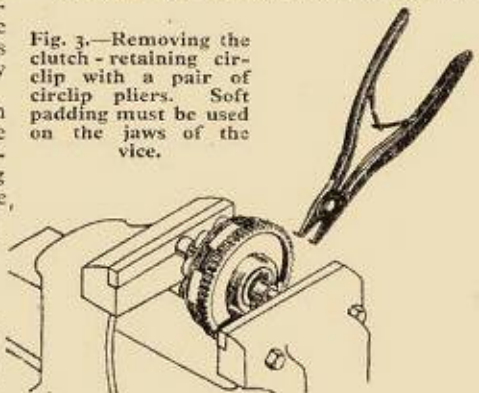
Remove the clutch push rod and again compress the clutch springs in the vice as shown in Fig. 4, so that the triangular clutch operating plate can be pulled sideways out of the clutch shaft. On releasing the vice, the remaining clutch components can be withdrawn.

Crankcase Dismantling

Undo the four crankcase stud nuts and remove the crankcase outer half. As the crankcase joint is made with jointing compound some resistance may be felt and in this case a tap on the back of the drain plug boss with a soft mallet will break the joint. The crankshaft main bearings are of the loose roller type and to avoid the flywheel and driveside rollers becoming intermixed, it is advisable to withdraw the flywheel assembly with the crankcase outer half.

Withdraw the flywheel assembly from the

Fig. 3.—Removing the clutch-retaining circlip with a pair of circlip pliers. Soft padding must be used on the jaws of the vice.



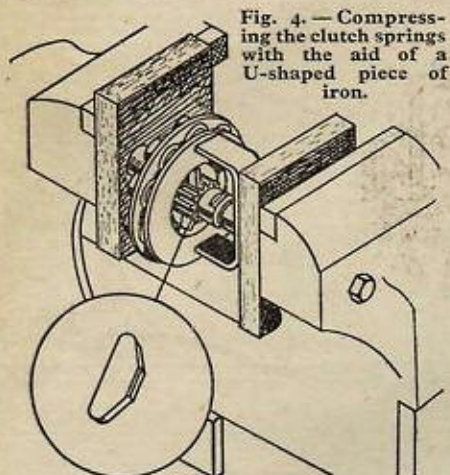


Fig. 4.—Compressing the clutch springs with the aid of a U-shaped piece of iron.

Crankcase Re-assembly

First assemble the clutch shaft bearing into the inner crankcase, warming the case if necessary. Place the drive side oil seal in position in the crankcase and push it home. Position the drive side roller outer race and push it in, making sure that it is square in the housing. Replace the flywheel side roller outer race in a similar manner. If the drive side crankcase was previously fitted with two separate roller outer races, the later type of single outer bearing can be fitted without modification. Do not replace the flywheel side oil seal at this stage.

Assemble the drive side rollers into the outer bearing using a little grease to keep them in place, and re-assemble the flywheel assembly into the drive side crankcase. Care is necessary when passing the mainshaft through the oil seal to ensure that the seal is not cut.

Assemble the first row of flywheel side rollers in the outer race (with a little grease to hold them in position) and seat the bearing spacer washer on top of the rollers. These bearing spacers are graded in steps of .003in. thickness, and if the original outer races are to be used the same spacing collar should be refitted. If new outer bearings have been fitted, a spacing collar should be employed which will allow the crankshaft assembly .003in. to .007in. end float when the crankcase halves are bolted firmly together. When bolting up the crankcase halves ensure that too thick a spacing washer has not been selected, or the flywheel assembly will be pinched and the mainshafts forced out of alignment.

When the crankshaft end play is within the above limits, the crankcase halves should be parted slightly and a good quality jointing compound applied sparingly to the joint faces, before again bolting the crankcase halves firmly together. Replace the flywheel side oil seal, taking care to avoid damage when pushing it over the lip on the mainshaft. Push the crankshaft pinion on to its spline and, preventing the flywheel from rotating as during dismantling, tighten the retaining nut and turn over the lock-washer.

Clutch Re-assembly

Place the clutch spring back-plate, clutch springs and clutch spring plate in position on the clutch shaft and compress the springs in a vice so that the triangular clutch operating plate can be positioned in the clutch shaft, then remove the assembly from the vice. Insert a piece of 3/16in. rod, approximately 2 1/4in. long, into the clutch push rod hole in the clutch shaft and thread the remaining clutch components, including the circlip, over the rod. Place the assembly between the jaws of the vice and compress the springs as during dismantling. Assemble the clutch plates and clutch gear-wheel, position the thin circlip washer, and then slide the circlip along the shaft to its locating groove. Ensure that the circlip is correctly located before the spring pressure is released.

Gearcase Re-assembly

Bolt the engine unit to bench fixture or vice so that the gearcase is uppermost. Place

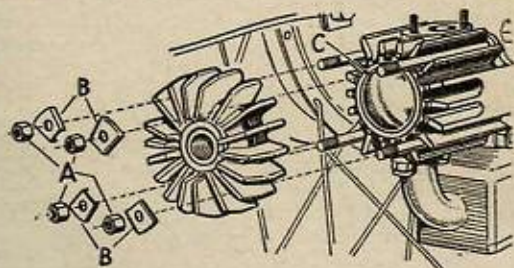


Fig. 6.—Cylinder head removed with the piston at T.D.C. The saddle washers, B, must be placed beneath the nuts, A.

the thin grit protection washer on the push rod end of the clutch shaft and tap the shaft into its bearing in the inner crankcase. Position the hub centre and sprocket carrier on the main spindle and screw down the adjuster cone finger tight. Push the thick grit protection washer on to the end of the clutch shaft so that its inside bevelled edge is towards the shaft.

Assemble the clutch shaft bearing into the gearcase cover, warming the cover if necessary.

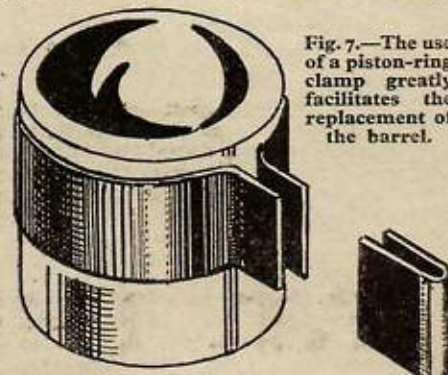


Fig. 7.—The use of a piston-ring clamp greatly facilitates the replacement of the barrel.

Place the gearcase cover in position on its retaining studs and tap it gently home, ensuring that it goes on evenly.

Final Points

Although the Winged Wheel is a simple unit to work on, there are one or two special points worth mentioning. In such a small engine it follows that full efficiency can only be obtained if special care is taken of assembly and maintenance. The cylinder head must be carefully tightened down, tightening each nut in rotation, and the saddle washers must be placed between the head and the nuts

crankcase outer half and remove the two rows of rollers and spacing washer. Some early models are fitted with two separate roller outer races and in this case only the outer row of rollers can be removed. The connecting rod and flywheel assembly is supplied as a unit and cannot be further dismantled.

Prise the oil seal out of the crankcase outer half with a medium size screwdriver, but making sure that there are no sharp edges which might cut the rubber part of the seal. Remove the outer roller race from the crankcase outer half.

Early models had two roller races and a spacing washer between them, and these can be pushed out together. If any of the races are tight the case should be suitably warmed. The single outer roller race, together with the oil seal, can then be pushed out of the inner crankcase in a similar manner. Re-assembly is carried out in the reverse order to dismantling. The need for extreme cleanliness cannot be over-emphasised.

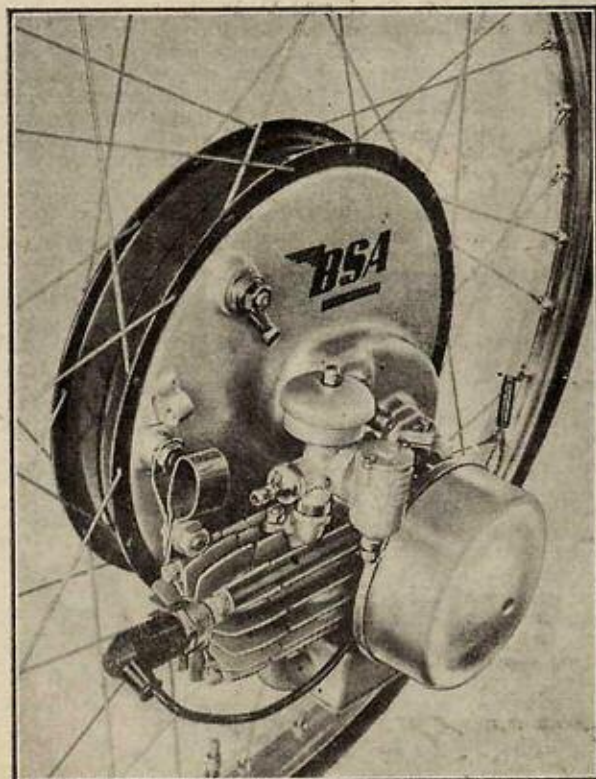


Fig. 5.—The Winged Wheel in position on a bicycle. Besides using an ordinary pedal cycle, it is possible to select a special machine with a stronger frame and heavier wheels and tyres.



Fig. 8.—The condition of the sparking plugs has a marked effect on the performance of the unit. The plug in the top drawing shows an ideal state of affairs, while the lower sketch shows a plug in need of attention.

(Fig. 6). The sparking plug must be cleaned, preferably on a sand-blasting machine, at regular intervals of about 1,000 miles.

Two-stroke engines often cause the plug to soot up inside the insulator as well as on the points and it is well worth the few pence asked to have the plug thoroughly cleaned.