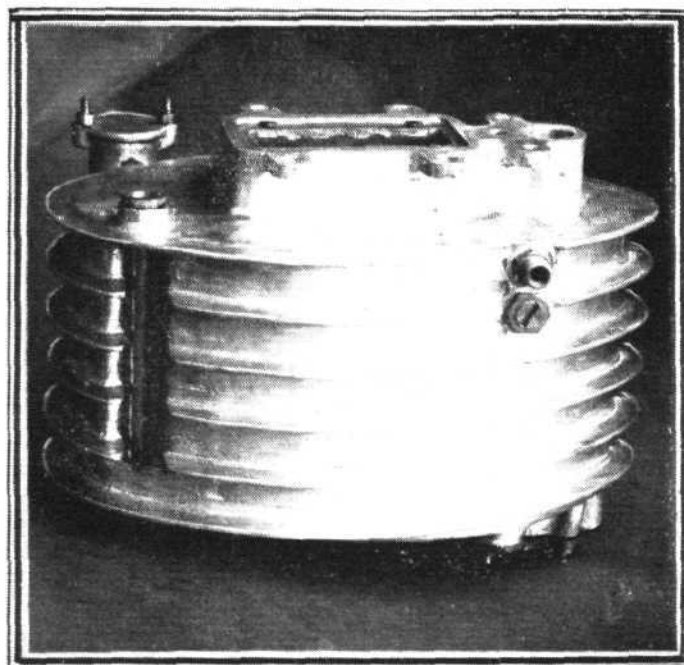


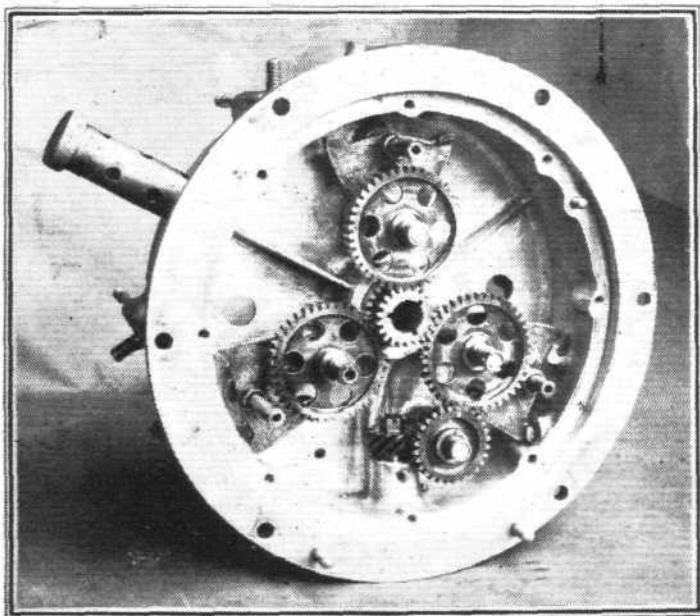
competitions the "Thrush" should particularly appeal on account of its low fuel consumption which averages 0.54 to 0.52 pints per horse-power per hour. In the competition the load carried per unit of fuel consumed for the total distance of 2,000 miles is the fundamental basis for the award of marks, and for an engine of less than 40 h.p. the fuel consumption of the "Thrush" can be regarded as very good.

The Blackburne "Thrush" is, as will be seen from the accompanying illustrations, a three-cylinder radial air-cooled, with overhead valves and a large oil sump built on as a separate unit below the crankcase. The latter is a large aluminium casting, generously ribbed, and is built in two halves, with the division placed laterally. The front half of the crankcase is dome shaped, and internally ribbed to give stiffness. In this portion are carried the two main ball journal bearings for the crankshaft, the front one being also a thrust bearing. A plain bearing in the rear half of the crankcase supports the rear end of the crankshaft, upon which is mounted the driving wheel for the valve timing gear, etc., shown in a photograph.

The crankshaft (hollowed for force feed lubrication) is built up in two halves, the crankpin being splined at its rear end where it fits into the rear web, which is slotted so as to enable the pin to be locked in place. The connecting rods are all identical, that is to say, there is no master connecting rod, and sit side by side on the crankpin, roller bearings being



The oil sump of the Blackburne "Thrush" is a separate unit, bolted to the bottom of the crankcase.



A view inside the timing gear-case of the Blackburne "Thrush," showing the valve gear for the three cylinders, the rockers, and the oil-pump drive.

employed for the big ends. The pistons are of aluminium, and are of normal type.

The timing gear is in the form of a plain spur gear, housed in the back of the rear half of the crankcase, the driving wheel on the crankshaft having the three camshafts and their gears symmetrically disposed around it as shown in a photograph. Here also is seen the helical gear for the oil pump, and the magneto drive. The rear bearings for the three camshafts, auxiliary drive shafts, etc., are in the back cover of the crankcase.

The overhead valves are operated by tappets from the rockers in the timing gear case, and it will be observed that the tappets cross over so as to be more nearly in line with the valve stems and thus reducing the oblique loads on the overhead valve mechanism. The valves are of the tulip type, held on their seating by two concentric coil springs each. These springs are located on the top of the cylinders by the fins of the cylinder heads having shallow grooves to prevent the springs slipping, and at their outer ends the springs are supported on washers, which in turn are held in place on the valve stems by small split collars housed in a recess in the valve stems. The details of this, and the manner of removing valves, are shown in some of our sketches.

A yoke in the shape of a very flat inverted vee braces the upper ends of the pillars supporting the overhead rockers, and also prevents them from twisting. At the same time they serve to convey lubricant from the grease cups to the rocker bearings.

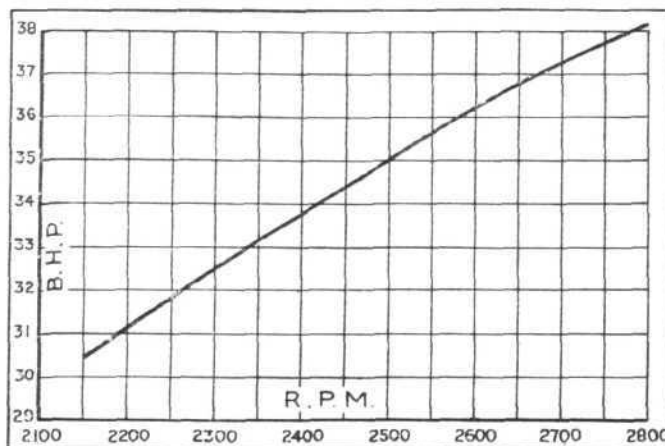
The steel cylinders are secured to the crankcase by four bolts each, and have detachable cast-iron heads with vertical fins running in a fore and aft direction. Six bolts secure the head to the cylinder, a plain copper washer being inserted to make a gas-tight joint. The six bolts by means of which the detachable cylinder heads are attached to the cylinders are dropped through holes in the fins, and a special spanner, forked to slip over the fins, is employed for tightening up the special bolts. The cylinder heads, it will be seen, are of very symmetrical form and should give a combustion chamber of very good shape. The two sparking plugs are placed opposite one another, and both are fired by the same magneto.

The B.T.H. magneto is mounted on a shelf on the back of the cover, and it is to be noted that an impulse starter is provided, so that there should be little difficulty in starting the engine. The carburettor is a Claudel-Hobson, type M.B.P., which is provided with a special patented atomiser, which, no doubt, accounts to a not inconsiderable extent for the very low fuel consumption. It might also be mentioned that the plugs used in the recent Air Ministry type tests were K.L.G. 12-mm. plugs, No. 214.

The "Thrush" is mounted in the aeroplane by six bolts through the flange at the back, the pitch circle for the holes, and their spacing, which is uneven, being shown in the rear view of the installation diagram.

Bolted to the bottom of the crankcase is a large oil sump, with ribs cast externally to improve the cooling. The oil pump draws oil from this sump, through a filter, and delivers it to the bearings, afterwards returning it to the sump through another filter. The sump has a capacity of 7 pints, which should be sufficient for quite long periods of running.

Most of the important overall dimensions of the Blackburne



Power curve of the Blackburne "Thrush."