OIL

IN MOVING PARTS

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IN machines and engines, the efficiency and life of many moving parts depend on proper lubrication, which in most instances means a constant and adequate supply of oil.

Simple assemblies are exceptions when they consist of a spindle and ball bearings or a shaft and roller bearings. The bearings can be packed with grease; and if the assemblies are provided with seals or grease retainers, they will run for long periods without attention. Examples are magneto armature bearings and the hubs of road vehicles.

It is different with plain bearings, particularly when they carry heavy loads at fast rubbing speeds. They are then often subjected to heat as well, and with scanty lubrication there can he speedy wear, if not seizure. Hence the need for an efficient supply of oil.

Depending on needs, a steady supply of oil to moving parts can be arranged in various ways. A stationary engine may be provided with drip-feed lubricators. The moving parts of a high-speed engine may be enclosed to employ the splash principle of lubrication. For short periods of running, a pressure supply can be arranged with a spring-loaded oil-gun, as on a boat engine. Last and best of all is an engine-driven pump, drawing from a sump to which the oil returns by gravity.

Even with an engine-driven pump, oil is supplied under pressure to the more imoortant bearings only. The remainder are lubricated by splash,. or by various devices which function automatically when fed with oil.

An example can be found in a bearing bush, or the shaft-which runs in it,, for either may be machined with a spiral groove which will not only serve to distribute the oil, but will cause it to move along-on the principle of an Archimedean pump. Thus oil may be transferred from one compartment to another, or on occasion lifted to a gallery. Again, it may be "screwed" back into a casing where a shaft projects to the outside.

In an enclosed engine, a machined groove encircling a bush, Al, provides a reservoir which is kept supplied by oil draining down the casing after being thrown up by the crankshaft. There may be a spiral groove in the bush for the oil to be screwed into the casing.

On the face of a bush, where thrust is taken, a shallow radial groove, A2, permits oil to enter by gravity; but a tangential groove in the direction of rotation, A3, provides an in-screwing action.

Thrown-up oil may be fed to bearings through suitable- drillings-but sometimes there is difficulty with the drilling, unless it is done through the bores of the bearings. Gudgeon pin bosses in pistons are examples; and the type of jig used, B, is applicable to others. The main part is machined or filed half through, and a half piece is made to fit. Small V-grooves are filed at an angle in both faces. Then a drill follows. Finally, the parts are sweated and soldered-and redrilled and turned if necessary.

Centrifugal action can be often used to advantage for lubricating enclosed rotating, parts. As an instance, a sprocket, in commercial size, may be hollowed at the face, C, and drilled at various positions in the teeth for oil to be thrown through. Oil which is fed directly to a chain should go to the inside run, where it will not be immediately thrown off. Gears should be fed on the in-running side.

With a small but heavily-loaded gear, lubrication can be provided for the teeth by combining the principles depicted at *A* and C (for the sprocket). The arrangement is as at D. Splashed-up oil is caught on the side of the casing to feed a reservoir-groove. Then it is screwed along the bush to the hollow back of the pear, from which holes lead to the teeth.

Oil may be pressure-fed to a small crankshaft. *E.* from a spring gun. The jig for drilling from the crankpin is a pair of bolted blocks. For centrifugal feed, a grooved ring can be attached to a crankshaft, *F,* and supplied from a bearing bush whose thick flange is grooved at the back and drilled in the periphery.