Beginner's Workshop

VALVES

GEOMETER describes some

types and their uses

IN ITS VARIOUS FORMS, the valve is an essential part of engines, pumps and pressure. systems depending for their function on the retention or flow of gases and fluids-air, water, petrol, oil, etc.

The simple valve works automatically from the difference in pressure existing on opposite sides. When pressure is higher on the side from which the valve permits flow, it operates. Otherwise, it remains closed, either by gravity, natural resilience, spring pressure, or because of the higher pressure on the opposite side-the actual means depending on the type of valve.

Some of the most common examples of valves are those used in cycle and motor tubes, where retention of pressure and absence of leakage are important-for which reason rubber is used for sealing. The cycle valve, *A,* employs a sleeve of thin rubber tube pushed on the central core, which is drilled and provided with a side hole covered by the rubber, pressure lifting this for the air to pass. In fitting, the central core is wetted, and the rubber pushed on until the end, passing over a swelling, contracts in a groove. Sealing in the stem is made on the rubber on the swelling.

For tubes of motor vehicles., the valve used is the Schrader having a core as at B, screwed into and removed from the stem with a slot-ended cap. An integral rubber ring seals the core into the stem, while the actual valve is a tiny rubber ring in a brass cup.

Testing for leaks

An advantage of these valves is that excess pressure can easily be released by depressing the central plunger, using a match stick. This can also be done to clear dirt causing slight leakage, although a cap with a rubber seal is always advisable. To test for leakage, the end of the valve stem can be wetted, or the wheel positioned with the valve at the top for immersion in a jar of water-this is applicable also to cycle valves.

VALVE

VALVE

VALVE

A   B   C

D   E   F
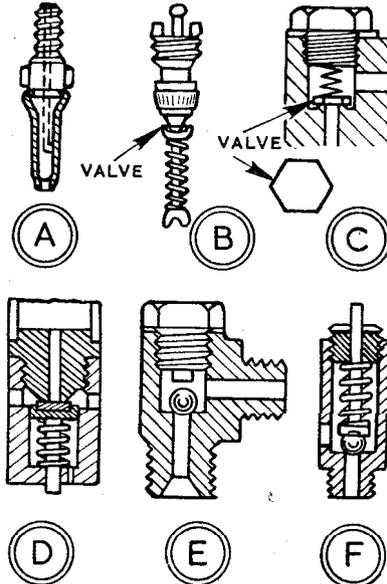
Neither valve is suitable for pressure containers for petrol or paraffin, owing to the effect of these on rubber.

The valves used for car petrol pumps are of plastic-fabric material. These are resistant to petrol and of hexagon shape, C, to permit flow. They rest on small raised seatings and, with use, can become grooved so as not to seal properly, pump action then being affected. Turning the valves over to the good side, or removing the grooving by rubbmg on a smooth file, are alternatives to renewal.

The valve used in the pump of a blowlamp or other pressure container, D, is a small special rubber disc (Neoprene) in a brass cup, spring-loaded on to a conical seating. A rising pump handle indicates this valve is faulty.

The common non-return valve, *E,* for water or other liquids, is a ball in a housing. For water, a brass or gun-metal housing and rustless steel ball are used. A leak-proof seating is

made by tapping down a similar-size ordinary steel ball. The cap should restrict lift for rapid functioning. A small boiler safety valve, *F,* is of similar construction, but spring-loaded and with an adjustable cap to regulate pressure.

The valve in a domestic pump is a flap type of leather with a brass or cast iron weight on top, G. A narrow neck of leather attaches the valve to the ring, sealing the pump body, H. It should be flexible, and if necessary may be thinned with a knife.

A special flap valve of thin flexible steel, **I** and J, is sometimes used for crankcase breathers on engines, and for crankcase air intakes of small industrial two-stroke engines. The arms or blades must cover the holes through which the air flows. Bright uneven areas can indicate wear-perhaps resulting in leakage.

A popular valve for stirrup and other water pumps is the conical seating metal type, *K,* with three guide wings below the head. Seating is done by grinding in with abrasive paste.

The poppet valve, L, is the standard internal combustion engine type. Originally inlet valves of this sort were fitted with light springs and automatically operated by the suction of the piston. Grinding in is with abrasive paste as for the other. ◻

VALVE

G   H

VALVE

I   J

K   L