DIAGRAM

CHASSIS LUBRICATION SYSTEM

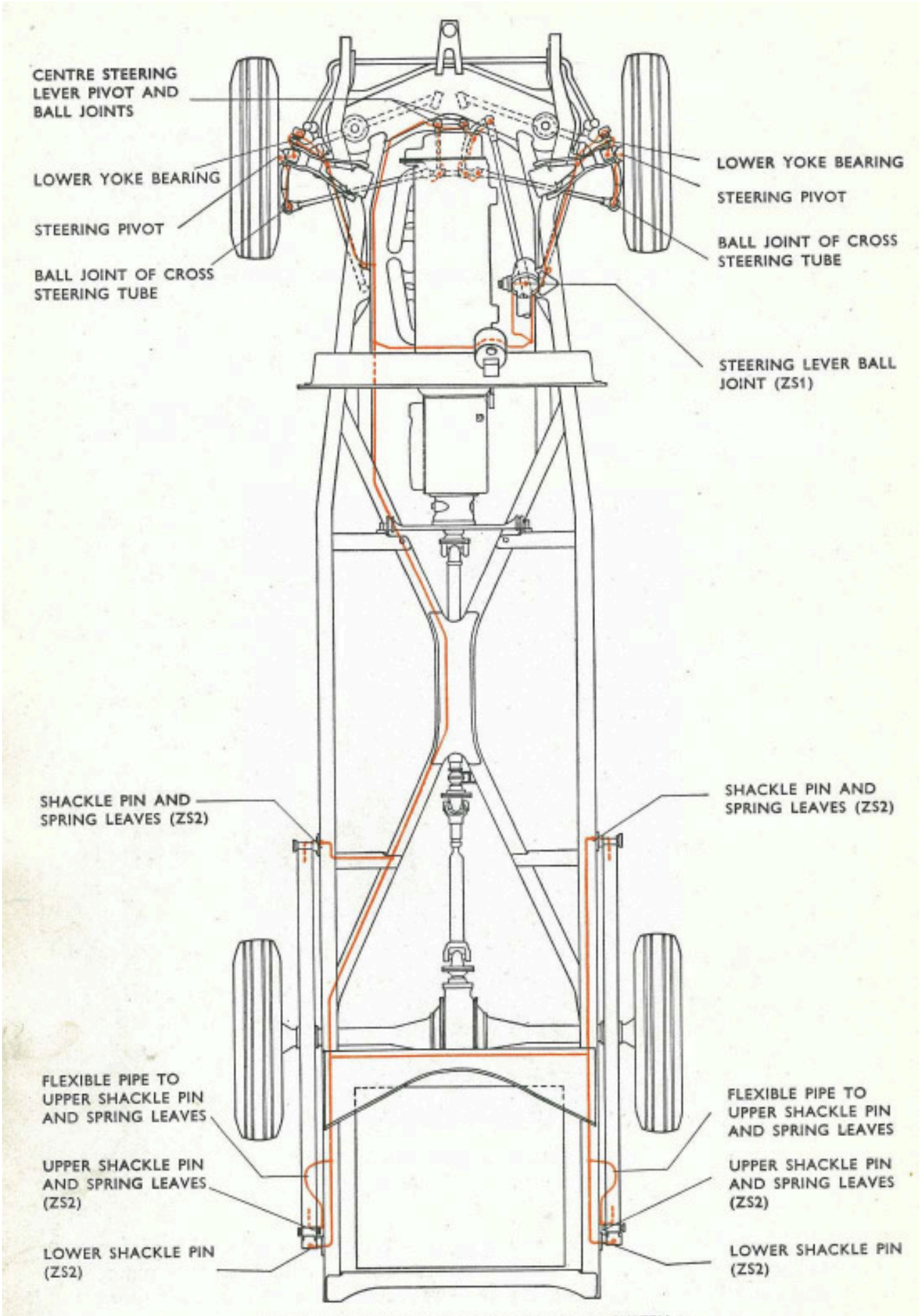

Fig. 5.—DIAGRAM OF CHASSIS LUBRICATION SYSTEM.

Foot-operated Oil Pump.

The chassis oil pump is shown in Fig. **4.** Normally no attention to the system is necessary beyond filling the reservoir with the correct oil (see page 30), after removal of the filling plug (**2**), as directed on page 31.

It should be filled to about one inch from the top of the filler cover.

When the reservoir is nearly empty it will be found that the pedal returns instantly after depression, due to the presence of air in the system.

On the other hand, if the pedal takes an abnormal length of time to return to its raised position, this may indicate that the felt strainer located at the bottom of the reservoir is choked. Under these circumstances a new felt strainer must be fitted.

This is arranged at the bottom of the reservoir, and is removed by disconnecting the two unions (**3**), and unscrewing the cap (**4**). An aluminium distance washer, the felt strainer pad, and a wire gauze support can then be taken out.

When replacing the parts, the wire gauze support should be refitted in the cap first, followed by a new felt pad and, finally, the aluminium distance washer *with its recessed face towards the felt pad.* Packing washers are provided on either side of the aluminium washer, and it should be observed that these are in position.

Normally, the felt strainer pad should be discarded and a new one fitted every 20,000 miles, as directed on page 36. It should never be necessary further to dismantle the pump.

Drip Plugs.

The drip plugs are non-adjustable and non-demountable, and are lettered and numbered to indicate their shapes and relative rates of oil emission respectively, a higher number indicating a greater rate.

The drip plugs never require cleaning, and, being non-demountable, no attempt must be made to take them apart. If one is suspected of being defective, it should be replaced with a new plug of the same rating. (See Fig. **5.**)

DIAGRAM

ENGINE LUBRICATION SYSTEM

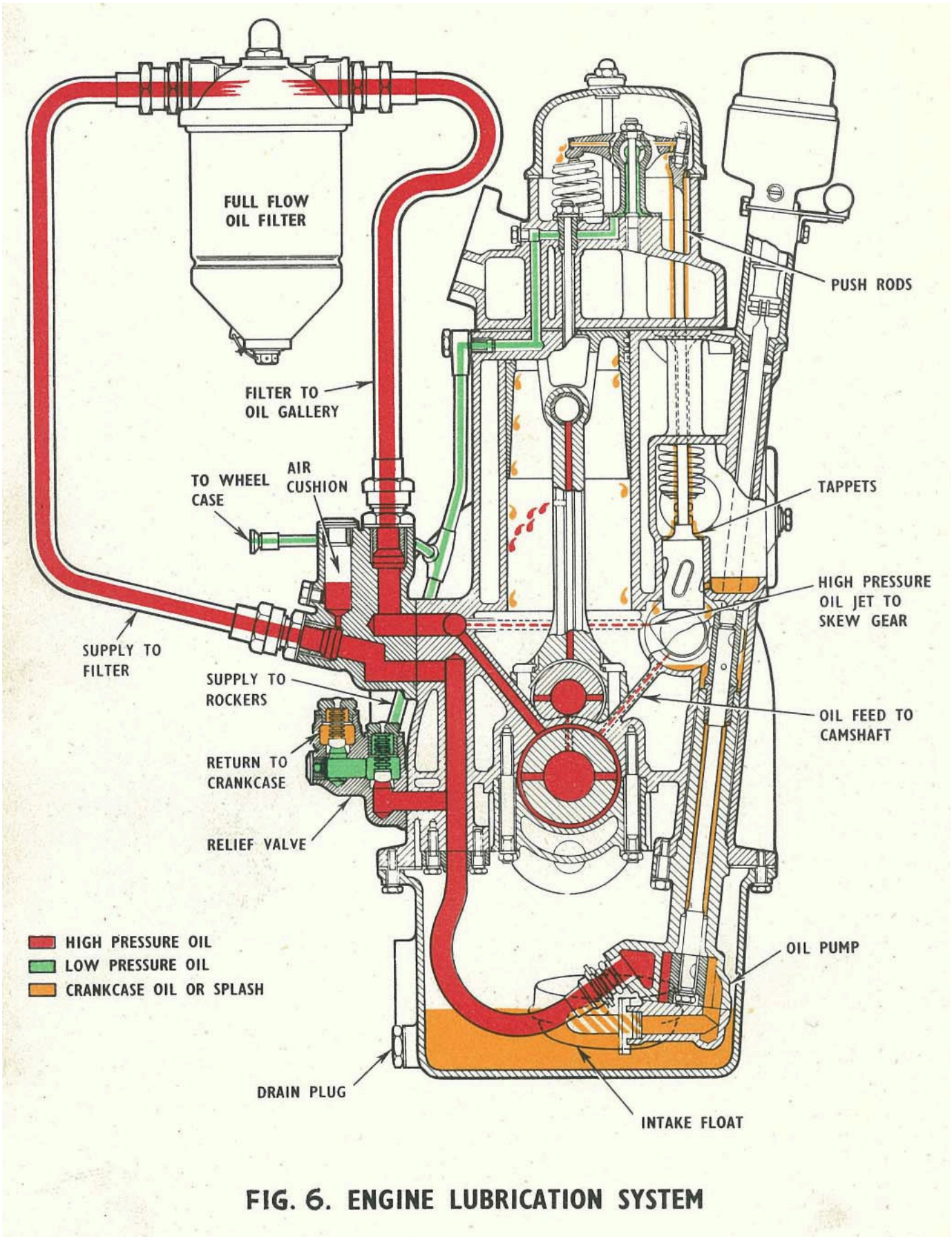

FIG. 6. ENGINE LUBRICATION SYSTEM

CHAPTER IV

Engine Lubrication System

Filling the System—Oil Pump—Oil Filter—Crankshaft and Connecting Rods—Relief Valves—Valve Rockers, Push Rods and Tappets—Camshaft—Oil Sump—Oil Level Indicator—Oil Pressure—Oil Temperature.

The engine lubrication system is of the forced feed, full-flow filtered type, and is diagrammatically illustrated in Fig. **6.**

Recommended oils will be found on page 29.

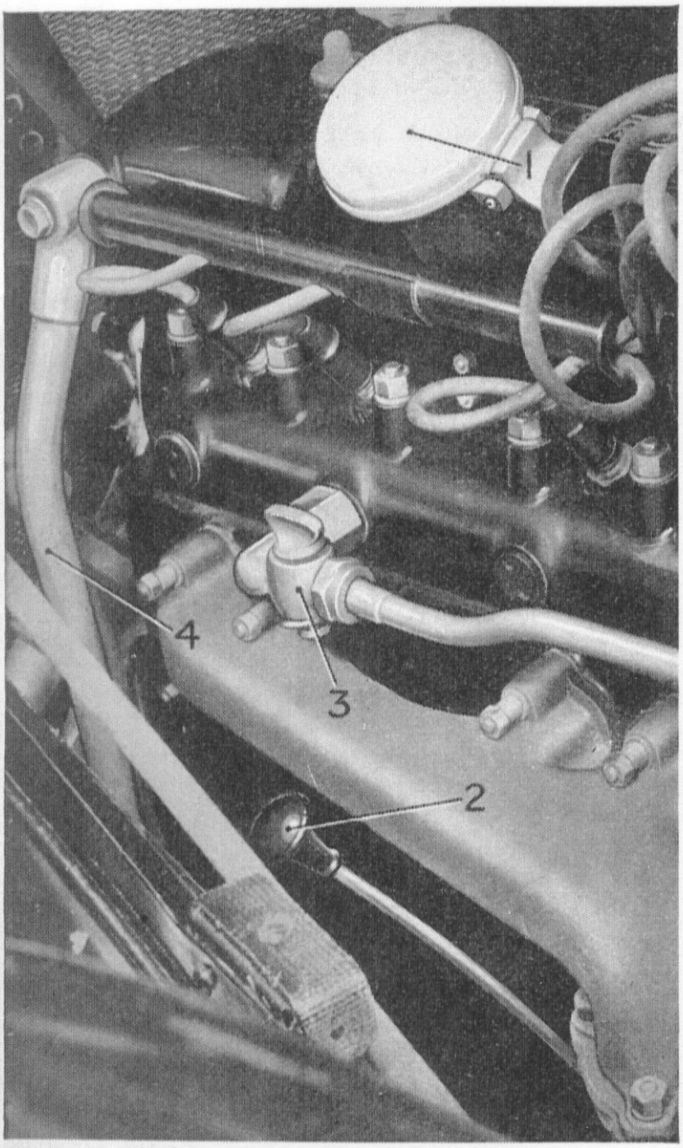

Fig. 7.—FILLER CAP AND DIPSTICK.

1. Engine oil filler cap.
2. Dipstick.
3. Heater—Isolating tap.
4. Breather pipe.

Filling the System.

The system is filled, or topped up, by opening the oil filler cap (**1**, Fig. **7**), on the inlet rocker cover, and pouring in the required amount of recommended oil.

It should be appreciated that it takes a little time for the oil to drain through to the sump, especially if the oil is cold.

The level of the oil should be frequently checked with the dipstick (**2**, Fig. **7**), **when the engine is not running,** and the system regularly topped up as required (see page 31), so as to keep the level of the oil up to the "Max" mark.

Oil Pump.

A gear type pump mounted in the lower half of the crankcase is driven by means of a vertically-mounted shaft and skew gears from the centre of the camshaft. A coupled extension of this shaft also drives the ignition distributor.

The oil intake from the sump is of the floating gauze filter type, ensuring the collection of clean oil, free from sludge.

Oil is drawn by the pump through the floating intake and delivered direct to the full-flow filter.

Oil Filter.

The full-flow filter is fitted on the right-hand side of the crankcase as shown in Fig. **8**, and, as previously stated, oil is fed direct from the pump to the filter, and, after passing through the filter, is returned via the relief valves to the main oil gallery, as shown in the diagrammatic illustration, Fig. **6**.

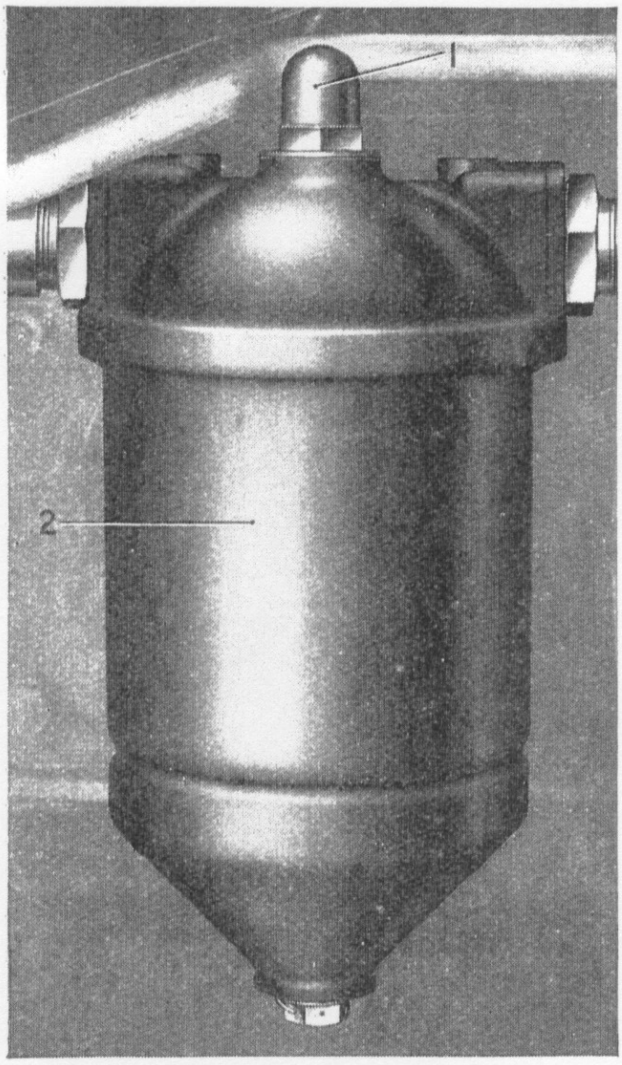

Fig. 8.—OIL FILTER.
1. Retaining bolt. 2. Filter bowl.

Every 5,000 miles, as directed on page 32, the filter element should be discarded and replaced with a new one. It is not practicable to clean the felt element, and no attempt must be made to do so.

The most convenient method of performing this operation is to remove the carburetters complete, and it is therefore suggested that this periodic maintenance should be undertaken by a qualified Service Station.

To remove the element, remove the lock plate securing the domed nut (**1**, Fig. **8**), unscrew the central fixing bolt and remove the bowl complete with the canister. Dismantle the canister by unscrewing the knurled nut from the bottom cover and extract the felt element and the two felt washers. Discard, and replace with new ones.

Re-assemble the canister and replace in bowl. Fill bowl with oil and replace in position.

(To be inserted in Bentley Handbook No. XI, to face page 43.)

OIL TEMPERATURE

An oil temperature gauge is fitted on the facia board. The temperature reading may be from 80°C to 110°C depending on atmosphere temperature and conditions of driving.

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When refitting the bowl, ensure that the rubber washer is in good condition and correctly fitted. On next running the engine, it should be inspected for oil leaks around the filter joint.

Crankshaft and Connecting Rods.

The filtered oil is conveyed to the relief valves, from where the main oil supply, controlled at approximately 25 lbs. per square inch, is delivered to the main oil gallery incorporated in the crankcase casting. From there it is fed through oilways drilled in the crankcase webs to each of the seven crankshaft main bearings, which are of the copper-lead-indium lined steel shell type.

The crankshaft journals and crankpins are bored for lightness and to act as oil conduits, the ends of the holes being plugged with steel caps.

All the main bearings have circumferential oil grooves, and radial holes are drilled in the crank journals to register with these grooves.

Oil from the main bearings passes to the bore of each journal through the radial transfer holes in the crankshaft and then to the crankpins through diagonal ducts drilled in the crankshaft webs, and so through radial holes to each crankpin big-end bearing, these bearings being of a similar type and material to that of the main bearings.

Each connecting rod is drilled to convey oil to the gudgeon pin bearing, the drilling passing through the big-end bearing shell. Small holes are cross-drilled into this oilway to allow a fine squirt of oil to lubricate the cylinder walls.

Two radial holes in the crankpin ensure communication, twice per revolution, with the oilway up the connecting rod. Thus, all the crankshaft and connecting rod bearings are supplied with oil under pressure.

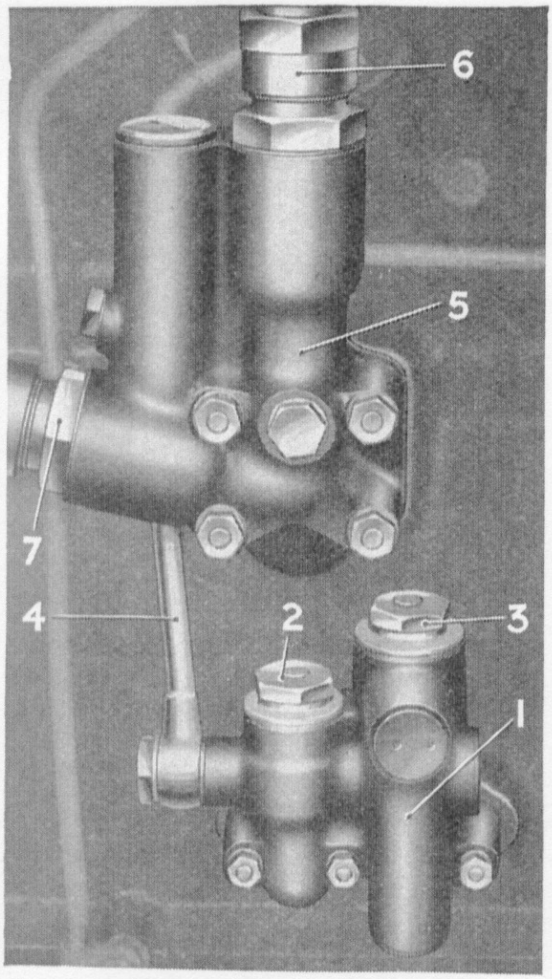

Fig. 9.—RELIEF VALVES.

1. Relief valve unit.
2. H.P. valve.
3. L.P. valve.
4. Feed to rockers.
5. High pressure oil connection.
6. Return from filter.
7. To filter.

Relief Valves.

The double relief valve unit is mounted on the right-hand side of the crankcase. (See Fig. 9.)

The two valves are in series, and their combined effect is to

regulate the pressure of the main high-pressure supply to the crankshaft and connecting rod bearings to approximately 25 lbs. per sq. inch.

Oil passing the high-pressure valve (**2**, Fig. **9**) enters the low-pressure chamber and from there via a pipe (**4**) to the inlet rocker shaft.

In order to ensure a supply of oil to the low-pressure system under all conditions of running, small slots are cut in the seating of the high-pressure valve (**2**).

If it is suspected that the relief valves are not working properly, they can be inspected by removing the plugs (**3** and **2**) above the low and high-pressure valves respectively.

In each case the valve spring will be found retained on the plug, and when removed, the valves may be lifted out for inspection and cleaning of valves and seats.

No attempt must be made to alter the spring setting by interfering with the springs themselves, or by varying the number of washers under the plugs.

Care must be taken to replace all parts in a perfectly clean state.

Valve Rockers, Push Rods and Tappets.

The low-pressure oil supply from the relief valves is conveyed via a pipe and oilway through the cylinder block and head to the centre pedestal of the inlet valve rocker shaft, which is drilled longitudinally, and also radially, in the plane of each rocker, to lubricate the rocker arm bearings. The rocker arms are also drilled, the holes running through the bearing bushes, to lubricate the push-rod ball ends and the ends of the valve stems.

Each valve stem is provided with a packing gland, held in position by the inner valve spring, which prevents excess oil from percolating down the valve guides. Oil is returned from the rocker casing to the crankcase through the push rod tunnels.

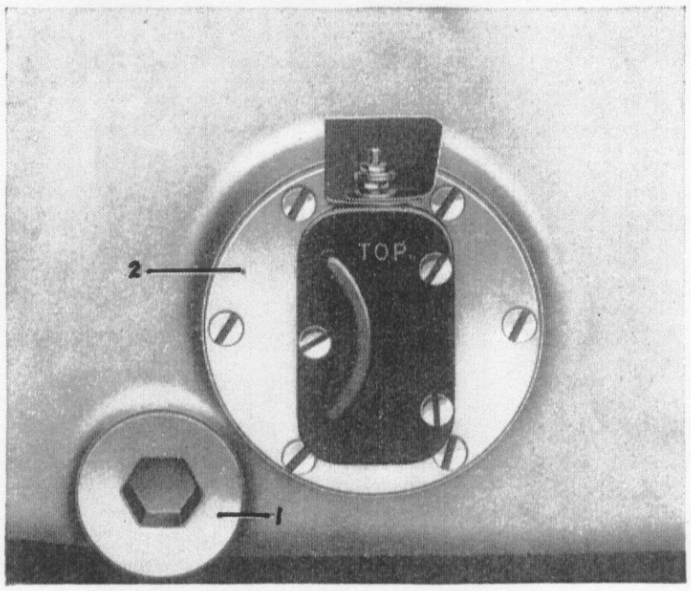

Fig. 10.—CRANKCASE DRAIN PLUG.
1. Drain plug. 2. Oil level indicator float unit.

Camshaft.

The camshaft, driven by single helical gears, is carried in four plain bearings, these being lubricated with high-pressure oil through drillings in the crankcase webs.

The camshaft driving gears are lubricated by the jet in the wheelcase, from the low-pressure system.