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INTERNAL COMBUSTION ENGINE

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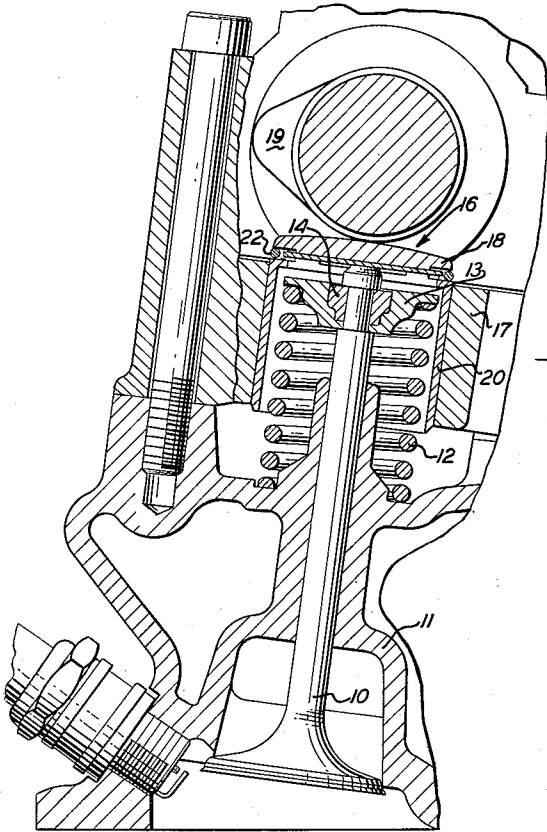


FIG. 1

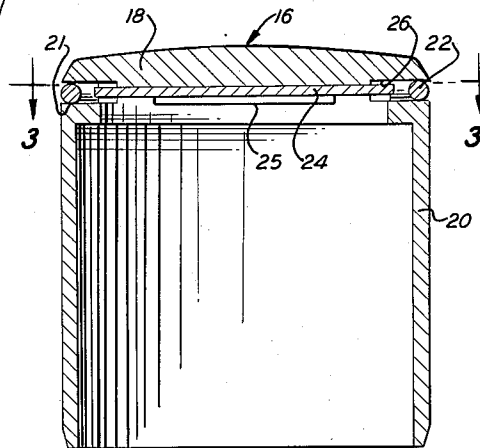


FIG. 2

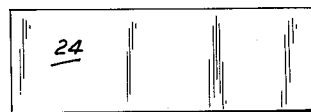


FIG. 4

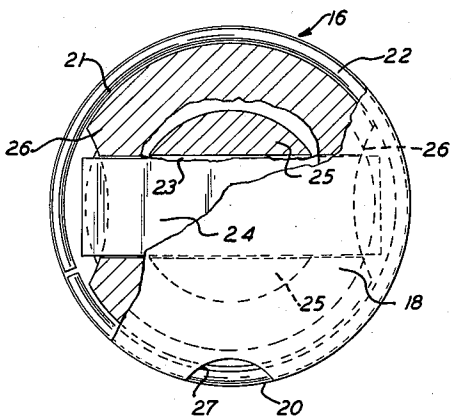


FIG. 3

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INTERNAL COMBUSTION ENGINE

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4 Claims. (Cl. 123—90)

This invention relates to the construction of an internal combustion engine and more particularly to the use of novel means for obtaining proper valve gear lash or clearance.

Because of thermal expansion, it is necessary to provide for lash in the valve gear train. Unless periodically adjusted, the normal engine wear of the valve gear parts increases the lash clearance resulting in excessive noise and improper valve clearance. A wide variety of means have been employed in the art to provide for adjustment of valve lash. These means include such constructions as hydraulic valve lifters, valve lifters having adjustable bolts, and push rods having shims retained within the push rods. These devices are relatively expensive to manufacture, require special tools for installation, and normally require the disassembly of all or a part of the valve gear train when adjustment is made.

In internal combustion engines of the overhead cam type, adjustment of lash has been done by placing shims inside of the cup-shaped push rod. Whenever adjustment was required, a partial disassembly of the valve gear train had to be made. An application of this invention is shown in an engine of this type. It is accomplished by providing a radially extending recessed passageway on the underside of the base portion of the push rod which communicates with an annular groove formed in the peripheral surface of the push rod. The passageway will accommodate any one adjustment plate within a specified range of thicknesses. The plate is restrained from lateral movement, of course, by the sides of the passageway and from longitudinal movement by a snap ring which is seated in the annular groove.

It is a principal object of this invention to provide a valve gear drive which has simple means for obtaining proper valve gear lash.

An additional object of this invention is to provide a valve gear train in which accurate valve gear lash can be provided without the use of special tools or the disassembly of parts.

Still another object of this invention is to provide valve gear adjustment means in the form of interchangeable plates between the push rod and the poppet valve stem.

Still another object of this invention is to provide adjustment means for obtaining proper valve clearance which is simple in construction, dependable in operation, and accessible for service work. Other objects of this invention will be made more apparent as this description proceeds particularly when considered in connection with the accompanying drawings wherein:

Figure 1 is a transverse section taken through a portion of an engine and showing a construction embodying the applicant's invention;

Figure 2 is an enlarged transverse section taken through the push rod shown in Figure 1;

Figure 3 is a plan view partly in section of the push rod shown in Figure 2; and

Figure 4 is a plan view of an adjustment plate.

Referring now to the drawings and in particular Figure

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1, a poppet valve 10 is provided in the cylinder block 11 and has the usual valve spring 12 which imparts lifting movement to the valve 11. Valve spring 12 is secured in place by a valve retainer 13 held to the poppet valve foot by locking members 14.

A cup-shaped push rod indicated at 16 is mounted for reciprocal movement in cylinder head 17. Push rod 16 is provided with a bottom portion 18 which is in contact with the lobe 19 of an overhead cam. Push rod 16 has side portions 20 which are in contact with the cylinder head 17.

Referring now to Figures 2 and 3, push rod 16 is provided with an annular groove 21 between the bottom portion 18 and the depending sides 20. A recessed passageway 23 on the underside of the portion 18 extends directly across the push rod 16 and communicates with the annular groove 21 at both ends. The side portions of the passageway are defined by depending guide portions 25. Passageway 23 will accommodate any one adjustment plate 24 with a thickness within a specified range. Groove 21 is further provided with an arcuate entrant form at each end for making easier the insertion of the adjustment plate 24 in the passageway. A snap ring 22 slidably engages the groove 21 so as to close off the passageway 23 after the proper thickness plate 24 has been inserted in it. Access to the snap ring is provided at the edge of the bottom portion in the form of a recess 27 so that the ring may be pried out of the groove 21 when a change of plates is desired.

Groove 21 may be of sufficient width so as to be able to handle a range of plate thicknesses normally required by the engine in its lifetime. It is also to be noted when the poppet valve 10 is in the closed position as is shown in Figure 1, the snap ring 22 and the groove 21 are disposed above the cylinder head thereby making it unnecessary to disassemble the valve gear parts except for the snap ring and the adjustment plate. This work may be done without the aid of special tools or equipment.

It will be understood that the invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. An overhead camshaft internal combustion engine comprising a cylinder head, a push rod having a bottom portion adapted to engage an overhead camshaft and depending side portions adapted to engage the cylinder head, a poppet valve disposed below said push rod and having a foot portion extending substantially axially into said push rod, a passageway on the underside of said bottom portion, a groove in the periphery of said push rod communicating with said passageway, a removable adjustment member of a length less than the diameter of said groove disposed in said passageway, and a snap ring mounted within said groove and confining said adjustment member within said passageway.

2. The structure defined by claim 1 which is further characterized in that said passageway, groove, adjustment member and snap ring are disposed above the level of the cylinder head in the closed position of the poppet valve.

3. An overhead camshaft internal combustion engine comprising a cylinder head, a push rod mounted for reciprocation in the cylinder head, a poppet valve disposed below said push rod and having a foot portion extending axially into said push rod, an annular groove in the periphery of said push rod, a passageway on the underside of the push rod extending in a plane normal to the axis of said push rod and communicating with the groove at both ends of the passageway, an adjustment plate removably disposed in said passageway, said plate having a length less than the diameter of the groove, and means

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yieldably mounted within said groove and confining said adjustment plate within said passageway.

4. The structure defined by claim 3 which is further characterized in that said passageway is defined on the underside of the push rod by a pair of depending guide portions, said passageway being arcuately recessed at each end of the passageway adjacent to the annular groove, said annular groove, passageway and adjustment plate

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being disposed above the level of the cylinder head in the closed position of the poppet valve.

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