Sept. 6, 1966 J. L. COTTON 3,270,726

VALVE TAPPET

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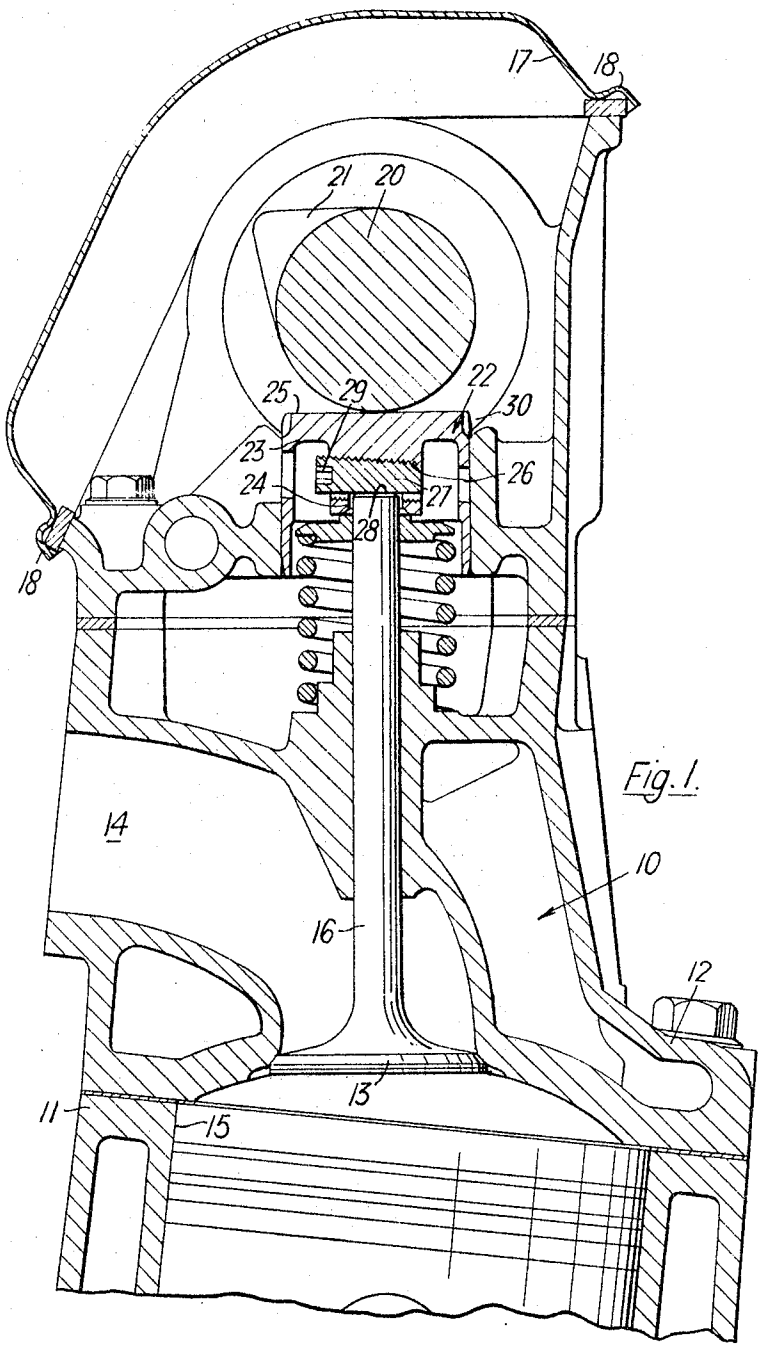


Fig. 1.

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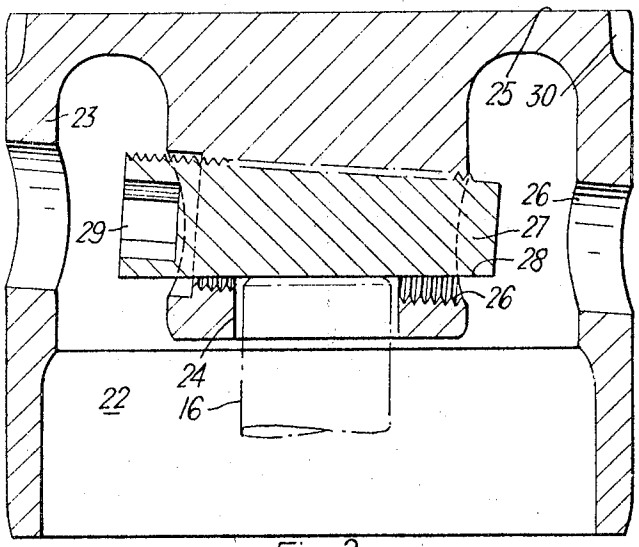


Fig. 2.

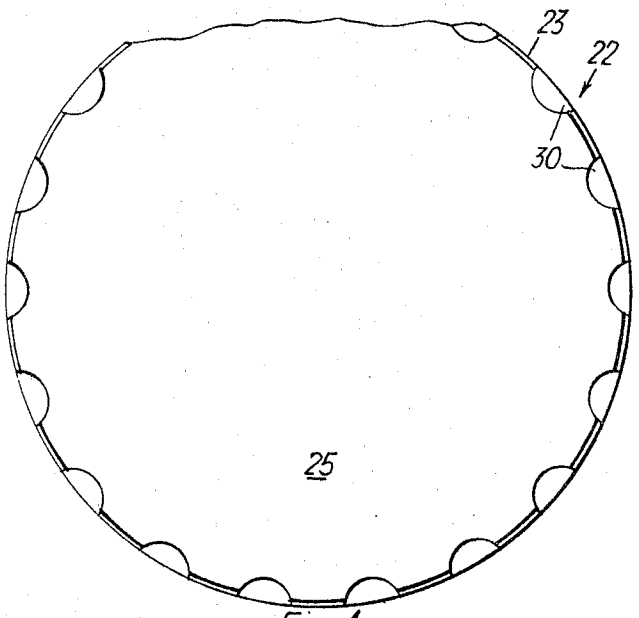


Fig. 4.

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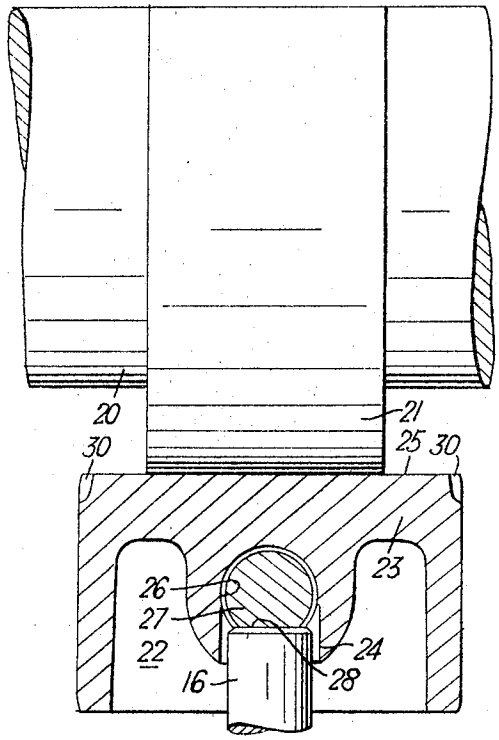


Fig. 3

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3,270,726

VALVE TAPPET

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Filed Oct. 20, 1965, Ser. No. 498,953
Claims priority, application Great Britain, Nov. 14, 1964, 46,479/64
6 Claims. (Cl. 123—90)

This invention relates to tappets or cam followers for valve mechanisms of internal combustion engines.

Various proposals have been made hitherto to make such tappets adjustable so that the opening and closing of each individual valve on the engine can be separately adjusted. Such tappets are interposed between the cam and the end of the valve stem.

An adjustable tappet according to the invention comprises a cup-member which is adapted to fit over the end of the valve stem and which has a transverse threaded bore containing an adjustable screw-plug having a tapered flat surface for contacting the end of the valve stem.

Preferably a single flat surface is formed on the screw-plug so that adjustment of the tappet clearance is effected in steps of single turns of the screw-plug.

The screw-plug also preferably has an end slot or recess for a screw-driver or squared key so that it can easily be rotated in the transverse threaded bore.

The axis of the threaded bore and the plane of the flat surface of the screw-plug are so disposed relative to the axis of the valve stem, that the flat surface in its various adjusted positions always fits flush with the end surface of the valve stem.

The scope of the monopoly is defined by the appended claims; the invention and how it can be performed are hereinafter particularly described with reference to the accompanying drawings in which:

FIGURE 1 is a vertical cross-section of the upper part of a cylinder of an internal combustion engine and shows an adjustable tappet in accordance with the invention in its installed operating position;

FIGURE 2 is an enlarged vertical section of the tappet shown in FIGURE 1;

FIGURE 3 is an enlarged part-sectional elevation of the tappet and cam shown in FIGURE 1; and

FIGURE 4 is a plan of the top surface of the tappet.

FIGURE 1 shows parts of an internal combustion engine **10**, including a cylinder block **11**, on which is mounted a cylinder head **12**, fitted with a conventional poppet valve **13**, for controlling a port **14**, connecting the engine cylinder **15** with the manifold (not shown). The valve **13** has a stem **16**. A conventional coil return spring for the valve is also provided. A cover **17**, secured to the cylinder head by resilient flanges **18**, encloses a rotatable cam shaft **20**, one cam **21** of which bears on an adjustable tappet **22** fitted over the end of the valve stem **16**. The cam shaft **20** is driven from the engine crankshaft in the conventional manner.

The adjustable tappet **22** (FIGURES 2, 3 and 4) comprises a body **23** formed as a cup-member with a cylindrical recess **24** for the end of the valve stem **16**. The "base" **25** of the cup-member is adapted to be contacted by the cam **21** which thus reciprocates the cup-member and the valve axially against spring pressure in well known manner.

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The cup-member **23** has a bore **26** which is transverse of the valve stem axis, and is slightly inclined thereto. The bore is uniform and is screw-threaded internally.

Inside the threaded bore **26** is a screw-plug **27** threaded to fit therein. It has a tapered flat surface **28** along its length, which, when in position, contacts with and fits flush with the end surface of the valve stem **16** (see FIGURE 3).

The screw-plug **27** can be set in any position within the threaded bore **26**; and by means of a screw-driver or key fitting into its slotted or recessed larger end **29** it can be rotated to effect axial movement along the bore **26**, and turns to effect clearance adjustment between itself and the valve stem **16** axially along the latter.

Such adjustment is made in steps of one turn of the screw-plug **27** so that its flat surface **28** is always set in flush contact with the end surface of the valve stem **16**. The pitch of the threads and the angular inclination of the axis of the threads are predetermined to effect desired step-wise axial adjustments. Thus various modifications of these relationships are possible.

The "base" **25** of the cup-member **23** has notches **30** around its rim (FIGURE 4). When the engine is running, the valve is rotated to even out any wear upon its chamfered edge. This rotation is effected in known manner, as by offsetting the line of contact of the cam **21** upon the tappet **22**, or by the twisting of the valve return spring as the valve reciprocates. The valve tappet **22** also rotates. Because of this rotation, the slotted end **29** of the tappet screw-plug **27** may not be accessible through a clear space on the engine cylinder head such that the screw-driver or key can be inserted to effect adjustment of the valve clearance. The notched rim **30** of the cup-member "base" **25** facilitates convenient finger-tip rotation of the tappet, to bring the screw-plug **27** into position for rotary adjustment.

In a modification (not shown) more than one flat surface is formed on the screw-plug to effect finer adjustments than those effected by one-turn rotations.

I claim:

1. A valve tappet comprising a cup member adapted to fit over the end of a valve stem and having a transverse threaded bore, a threaded plug carried for screw adjusting movement in said bore and having a flat surface along one side adapted to contact the end of the valve stem, said surface lying at an angle with respect to said bore, whereby axial adjustment of said plug in said bore to any of a plurality of positions wherein said flat surface may contact said valve stem, adjusts the effective length of said valve tappet.

2. A valve tappet as defined in claim **1** wherein said threaded plug includes at one end a recess so shaped as to enable rotation of said plug by an externally applied tool.

3. A valve tappet comprising a cup member having a cylindrical recess adapted to fit over and enclose the end of a valve stem, said cup member having a transverse threaded bore intersecting said cylindrical recess and forming an angle with respect to a plane perpendicular to said recess, a threaded plug carried for screw adjustment in said bore and having a flat surface along one side adapted to contact the end of said valve stem, said surface forming an angle with respect to said bore such that upon adjustment of said threaded plug to any of a plurality of positions said surface will lie in a plane perpendicular to said cylindrical recess, such adjustment being effective to determine the effective length of said valve tappet.

4. A valve tappet as defined in claim 3 wherein said threaded plug includes at one end a recess so shaped as to enable rotation of said plug by an externally applied tool.

5. A valve tappet as defined in claim 3 wherein said cup member includes a rim surrounding the end opposite said cylindrical recess and said rim has a plurality of notches adapted to assist manual rotation of said cup member.

6. A valve tappet as defined in claim 4 wherein said cup member includes a rim surrounding the end opposite said cylindrical recess and said rim has a plurality of notches adapted to assist manual rotation of said cup member.

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