March 13, 1962 C. WUEST 3,024,775

VALVE TAPPET

Filed April 29, 1960

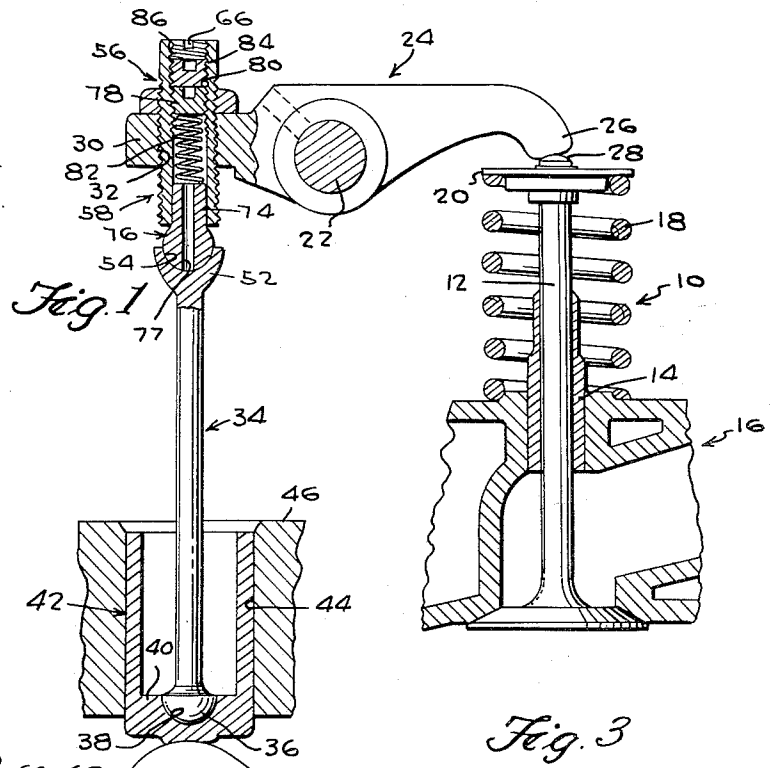


Fig. 1

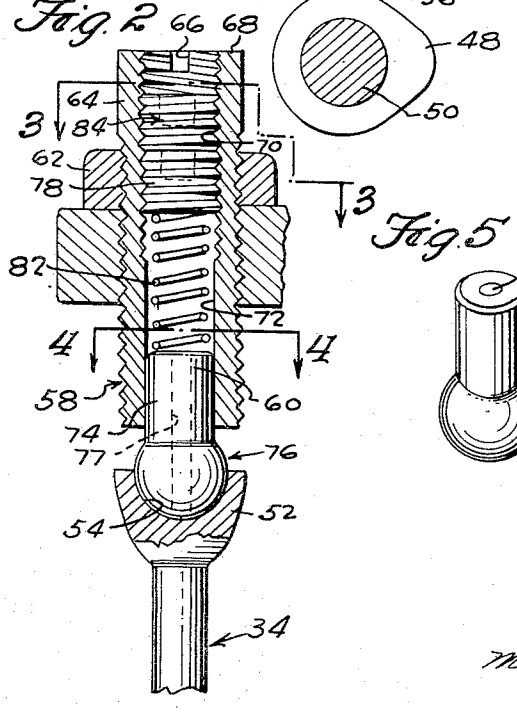


Fig. 2

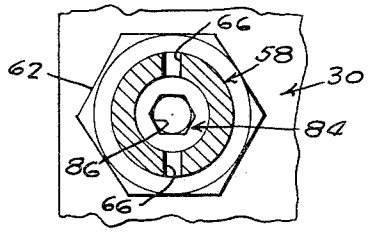


Fig. 3

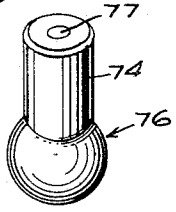


Fig. 5

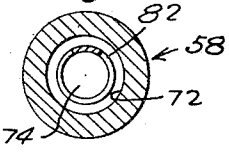


Fig. 4

INVENTOR.
Clemens Wuest
BY
McMorrow, Berman & Davidson
ATTORNEYS

United States Patent Office 3,024,775 Patented Mar. 13, 1962

3,024,775

VALVE TAPPET

Clemens Wuest, 320 E. Main St., Fredericksburg, Tex.

Filed Apr. 29, 1960, Ser. No. 25,594
5 Claims. (Cl. 123—90)

This invention relates to a novel tappet valve mechanism, primarily for internal combustion engines.

The primary object of the invention is the provision of a generally improved, and quieter tappet valve mechanism, which is more wear resistant, and more efficient in operation.

Another object of the invention is to provide tappet valve mechanism of the character indicated above which is adjustable more easily and accurately, and wherein adjustments of valve clearance are more reliably maintained.

A further object of the invention is to provide a tappet valve mechanism of the character indicated above, which is relatively non-complex in construction, is composed of a small number of simple and easily assembled parts, and which can be manufactured at low cost.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a fragmentary and schematic side elevation, with portions in section and broken away, showing a tappet of the present invention mounted on a valve rocker arm and engaged with a push rod;

FIGURE 2 is an enlarged vertical section taken through the tappet and the rocker arm;

FIGURES 3 and 4 are horizontal sections taken on the lines 3—3 and 4—4 of FIGURE 2; and,

FIGURE 5 is a perspective view of the head of the tappet.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the numeral 10 generally designates a valve having a stem 12 working through a guide 14 in an internal combustion engine head 16, with a valve-closing spring 18 circumposed on the stem 12 and compressed between the head 16 and a washer 20 secured on the upper end of the stem. A shaft 22 is suitably supported at one side of the valve 10, and a rocker arm 24 is journalled intermediate its ends on the shaft 22 and has an end 26 bearing downwardly upon a boss 28 on the upper end of the valve stem 12. On the opposite end of the rocker arm 24 is a flat, generally horizontal lug 30 which has a threaded opening 32 therethrough.

The lug 30 is in vertical alignment with the upper end of a push rod 34 having an enlarged hemispherical knob 36 on its lower end which is seated in a concave, conformably shaped recess 38 provided in the bottom wall 40 of a cup-shaped piston 42, which works in a vertical bore 44 present in a port 46 of the associated engine, with the underside of the bottom wall 40 in engagement with a cam 48 on a rotary cam shaft 50. The push rod 34 has an enlarged diameter seat 52 having a hemispherical recess 54 in its top.

The rocker arm lug 30 is operatively connected to the push rod 34 by a novel tappet, generally designated 56. The tappet 56 comprises a vertically elongated sleeve 58 which has an externally threaded portion 60 which is threaded through the rocker arm lug opening 32 and extends above and below the lug 30, and has thereon a lock nut 62 to be tightened against the upper surface of the lug 30 so as to lock the sleeve 58 in vertically adjusted positions in the lug 30. The exterior of the sleeve 58, above the threaded portion 60, is preferably smooth,

as indicated at 64, and the sleeve has diametrically opposed tool accepting notches 66 in its upper end 68.

The sleeve 58 has an axial bore extending therethrough which is composed of a threaded upper portion 70 and a smooth lower portion 72. Slidably and rotatably engaged in the lower bore portion 72 is an upstanding cylindrical shank 74 on an enlarged diameter spherical tappet head 76, which seats conformably in the recess 54 of the push rod seat 52. The tappet head 76 and its shank 74 have an axial bore 77 extending therethrough, which serves as a capillary tube for conveying lubricating oil from the seat recess 54 into the interior of the sleeve 58, for lubricating the moving parts in the sleeve, the oil being supplied by any suitable means (not shown), to the seat recess 54.

Threaded downwardly in the threaded upper bore portion 70 of the sleeve 58 is an adjusting plug 78 having a tool socket 80 in its upper end, and located mainly in the smooth lower bore portion 72, is a helical spring 82, preferably smaller in diameter than the bore portion 72, which is compressed between the lower end of the adjusting plug 78 and the upper end of the tappet head shank 74. The adjusting plug 78 is adjusted in the sleeve 58 so as to maintain constant spring seating of the tappet head 76 in the recess 54 of the push rod 34, and the end 26 of the rocker arm engaged with the valve stem boss 28. Threaded downwardly in the upper bore portion 70 above and bearing upon the adjusting plug 78 is a locking plug 84, having a tool socket 86 in its upper end, which serves to lock the adjustment of the adjusting plug 78.

Adjusting the sleeve 58 in the lug 30 desirably affords preliminary adjustment of the tappet 56 relative to the push rod, and this adjustment is securely locked by means of the lock nut 62 and is not subject to being changed by wear of the parts. Final and fine adjustment of the tappet 56 relative to the push rod 34 is obtained by adjusting the adjusting plug 78 in the sleeve 58, with the locking plug 84 removed from the sleeve, and this adjustment is not subject to being changed by wear occurring between the sleeve 58 and the adjusting plug 78, but is affected only by wear on the tappet head 76 and the recess 54 in the push rod 34, and collapse of the spring 82. The provision of the capillary lubricant bore 77 in the tappet head 76 provides for lubrication to reduce wear between the tappet head shank and the sleeve bore, and between the tappet head and the push rod recess 54, and the oil present between these parts cushions the contacts therebetween and substantially reduces or eliminates tappet noise when the valve mechanism is in operation.

The cushioning and shock-absorbing effects obtained by the spring 82 and the oil between the parts described, serve also to reduce noise and wear in the shaft 22 and the rocker arm 24 and between the rocker arm end 26 and the valve stem boss 28. Further, the spring acts to keep the rocker arm end 26 in constant contact with the valve stem boss 28, so as to reduce or eliminate wear and noise at this location.

While there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A valve tappet comprising a sleeve having first and second ends, and having a bore extending to said ends, means on said sleeve for mounting the sleeve on a rocker arm, plug means threaded in said first end of the sleeve, a tappet head having a reduced shank, said shank being

slidably engaged in the second end of the sleeve, said tappet shank having an enlarged end positioned externally of and near to said second end of the sleeve, spring means in said bore compressed between said plug means and said shank, and a lubricant bore extending through said head and said shank and opening into the bore of the sleeve.

2. A valve tappet comprising a sleeve having first and second ends, and having a bore extending to said ends, means on said sleeve for mounting the sleeve on a rocker arm, plug means threaded in said first end of the sleeve, a tappet head having a reduced shank, said shank being slidably engaged in the second end of the sleeve, said tappet shank having an enlarged end positioned externally of and near to said second end of the sleeve, spring means in said bore compressed between said plug means and said shank, and a capillary lubricant bore extending through said head and said shank and opening into the bore of the sleeve, said enlarged end being hemispherical and adapted for seating in the recess of a push rod seat.

3. A valve tappet comprising a sleeve having first and second ends, and having a bore extending to said ends, means on said sleeve for mounting the sleeve on a rocker arm, plug means threaded in said first end of the sleeve, a tappet head having a reduced shank, said shank being slidably engaged in the second end of the sleeve, said tappet shank having an enlarged end positioned externally of and near to said second end of the sleeve, spring means in said bore compressed between said plug means and said shank, and a capillary lubricant bore extending through said head and said shank and opening into the bore of the sleeve, in combination with a push rod having a seat having a concave lubricant containing recess, said enlarged end being hemispherical and seated in said recess with the lubricant bore communicating with said recess.

4. A valve tappet comprising a sleeve having first and second ends, said sleeve having a smooth bore portion extending to said second end, plug means threaded in said first end, a relatively short shank slidably engaged in said smooth bore at the second end of the shank and having an enlarged head on its outer end, said head being close to said second end of the sleeve when the head is engaged in a push rod seat, and a helical spring in the bore of the sleeve and engaged with said plug means and said shank, said spring being longer than said shank in the uncompressed condition of the spring.

5. A valve tappet comprising a sleeve having first and second ends, said sleeve having a smooth bore portion extending to said second end, plug means threaded in said first end, a relatively short shank slidably engaged in said smooth bore at the second end of the shank and having an enlarged head on its outer end, said head being close to said second end of the sleeve when the head is engaged in a push rod seat, and a helical spring in the bore of the sleeve and engaged with said plug means and said shank, said spring being longer than said shank in the uncompressed condition of the spring, and a lubricant bore extending longitudinally through said shank and said head for conveying lubricant from a push rod seat to the spring and the shank.

References Cited in the file of this patent

UNITED STATES PATENTS

2,564,902	Houser et al.	Aug. 21, 1951
2,720,874	Brooks	Oct. 18, 1955
2,923,282	White	Feb. 2, 1960