

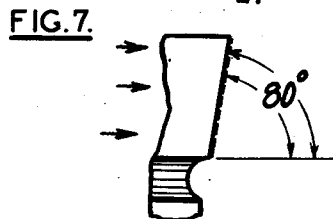
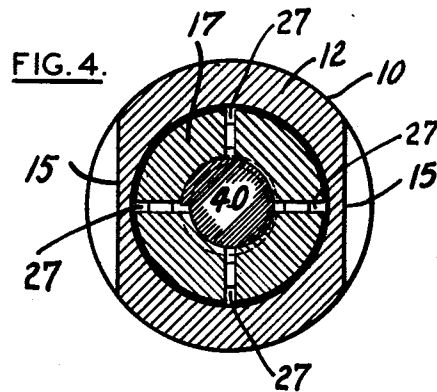
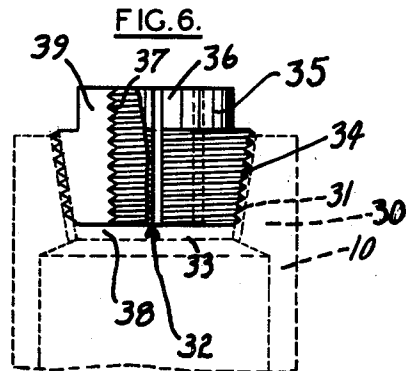
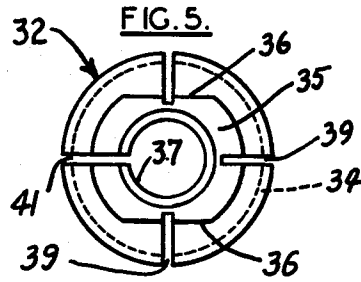
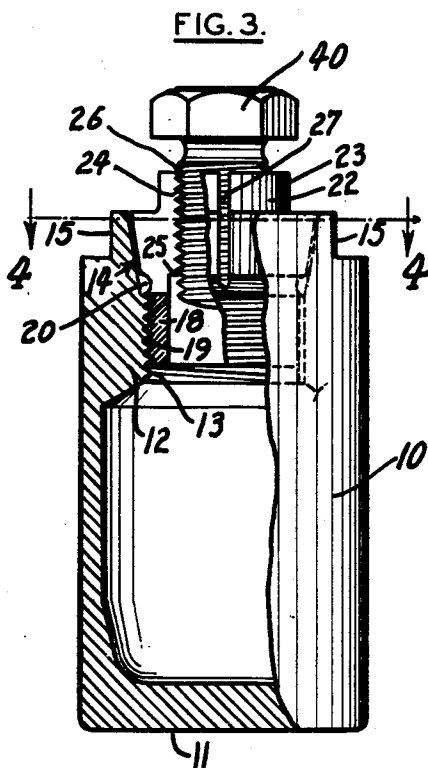
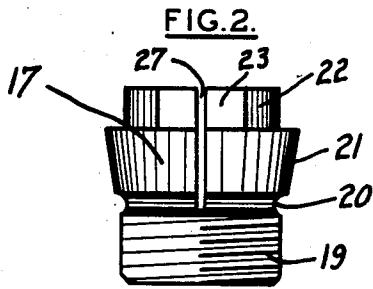
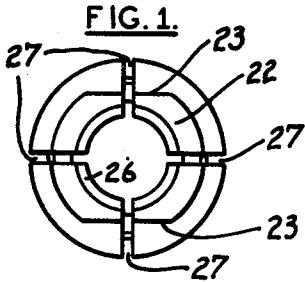
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P. F. BERGMANN ET AL

2,264,561

TAPPET ASSEMBLY

Filed May 11, 1939



INVENTORS.

PAUL F. BERGMANN.

RALPH W. OSBORN.

Thomas V. Boman. ATTORNEY.

UNITED STATES PATENT OFFICE

2,264,561

TAPPET ASSEMBLY

Paul F. Bergmann, North Muskegon, and Ralph W. Osborn, Muskegon, Mich., assignors to Johnson Products, Inc., Muskegon Heights, Mich., a corporation of Michigan

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1 Claim. (Cl. 151-19)

This invention relates generally to an adjusting means and more particularly to a self-locking tappet assembly.

It is well understood by those skilled in the art that tappets must be frequently adjusted in order to give quiet and efficient operation of an engine, as an automobile engine, and it is one purpose of this invention to create a tappet which may be adjusted so that it may be further adjusted under chosen degrees of force.

In other words, our invention contemplates a first or initial adjustment which may be more or less permanently set. Then, the second adjustment may be used whenever necessary or desirable to lengthen or shorten the tappet length and this latter adjustment is made under whatever resistance was initially placed upon the tappet parts by the initial adjustment. And, of course, no further manipulation is necessary.

It will be understood that different types of engines and the different uses to which they are put, call for different degrees of force needed to assure locking of the tappet parts and our invention takes care of this condition as will be more fully understood as the description proceeds.

Briefly described, our invention consists of two tappet parts with a bushing therebetween, the bushing being threaded inside and out in novel arrangement together with a slanted outer surface together with vertically extending grooves.

Thus spring elements are formed and our invention contemplates not only movement of these to vary the locking of the threaded element received therebetween but also their corresponding outward reaction against the outer shell or member of the tappet whereby these other two parts of the tappet are locked together.

Still further objects or advantages subsidiary or incidental to the aforesaid objects, or resulting from the construction or operation of the invention as it may be carried into effect, will become apparent as the said invention is herein-after further disclosed.

For the purpose of illustrating our invention we have shown in the accompanying drawing two forms thereof which are at present preferred by us, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized and that our invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

In the drawing:

Fig. 1 is a top view of our novel locking bushing.

Fig. 2 is a side view thereof.

Fig. 3 is a side view, partly broken away, of our self locking tappet assembly.

Fig. 4 is a sectional view taken along the plane of the line 4-4 of Fig. 3.

Fig. 5 is a top plan view of a second type of bushing.

Fig. 6 is a side view of Fig. 5, parts being broken away in order to expedite the showing.

Fig. 7 is a schematic view illustrating the bending of the bushing.

Similar numerals refer to similar parts throughout the several views.

Referring to the drawing, numeral 10 indicates the body of a tappet member, chilled as at 11, see Fig. 3, and extended to form a reinforcing rib 12 which is threaded as at 13. This threaded portion extends upwardly as shown and then a tapered seat or slanting wall 14 is formed. The upper outer edge of the cylindrically shaped body is cut away as shown to form the wrench flats 15. See Figs. 3 and 4. Thus a tool may be applied to the tappet body to hold it during the adjustment manipulation.

Referring now to Figs. 1 and 2, 17 indicates the bushing generally. This is formed of a ring member 18, see Fig. 3, which is threaded at 19, and these threads match the threads 13 previously referred to. A groove 20 is located immediately above the threads 19 and then a conical section 21 extends outwardly and upwardly. The upper part of the bushing carries an extension 22 having wrench flats or the like 23, see Figs. 1 and 2, for adjusting the same.

The bushing is centrally drilled or recessed and threads 24 extend downwardly therein to the shoulder 25, see Fig. 3, at which point the central recess is enlarged so that the adjustable bolt or element 40 may freely pass therethrough. Preferably this bolt 40 is formed of steel and hardened on its top surface.

The bushing has its central threaded hole beveled at 26 and slots 27 extend at right angles to each other and diametrically across the bushing. These slots extend downwardly to points below the center of the groove thus dividing the upper part of the bushing into four segments, each segment being capable of displacement. Each of the segments carries one-fourth of the conical section 21 previously referred to.

From the above description it will be readily understood that the bushing member 17, shown in

Fig. 2, may be entered into the mouth of the cylinder member 10, the threads 19 entering the threads 13. Upon rotation in the proper direction the several segmental conical surfaces 21 on the bushing 17 come into contact with the seat or similarly inclined surfaces 14 and a tight fit occurs. Upon further twisting or entering of the bushing the spring fingers or movable means located between the slots 27 are gradually compressed and thus the threads 24 formed thereon gradually lessen their pitch diameter with the result that the stud 40 is more securely held. For each adjustment of the bushing 17 there is a constant fixed tension which holds the bolt 40 in position. And the bolt 40 must be turned against this particular chosen amount of friction in order to move and adjust it.

That is, the bolt 40 may be positioned as shown in Fig. 3 or else it may be turned, within limits, to any of its many other positions yet the force required to turn it will remain the same. And the bolt 40 will be locked in its position against turning by the same constant amount of force.

And, additionally, the reaction of the spring members against their inwardly facing tapered seat 14 causes the bushing to be locked in place in its cylindrical member 10. Fig. 7 diagrammatically illustrates the bodily movement and the tilting movement of one on the spring members inwardly.

Fig. 6 shows the cylindrical member 10 in dotted lines, this member having a neck portion 30 and a tapered threaded portion 31. A bushing member 32 has exterior tapered threads 34 as shown and terminates in a boss 35 having flats 36. The bushing member is drilled and threaded at 37 to receive the bolt (not shown). Thus an adjustment is had between the bolt and the bushing.

The bushing member is formed with grooves 39 and one of these grooves extends completely therethrough to form a slot 40. Thus the bushing member may be compressed more or less to give the desired degree of turning resistance to the stud as desired.

It will be understood that the bushing 32 may be placed within the conical shaped threaded opening and then rotated to bring these members into more or less tight relationship thus bringing the spring quarters of the bushing 32

which are located between the several slots or grooves into more or less closer relationship. Thus the bolt which is received within this bushing is more or less tightly held as desired. It will be understood that the slope of the threads 31 and 34 may be lessened if desired. This would give a slower adjustment and a more powerful locking action.

Preferably, the cylinder members 10 are formed of cast iron, whereas the bushings may be formed of steel. The bolts 40 may be of steel, hardened on their top surfaces.

From the above description it will be appreciated that we have invented a tappet which can be quickly adjusted to the exact position desired inasmuch as the locking thereof is not manually made but is automatic or inherent in the structure and thus the exact adjustment is not changed by the subsequent manipulation of the locking nut after the proper tension has been made.

Also, our invention is novel inasmuch as the locking pressure is doubly exerted and utilized in both directions, that is, the bushing holds the stud and also holds itself against accidental movement.

Having thus revealed our invention, we claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of the United States.

We claim:

1. An adjustable bolt assembly comprising a member having an opening therein, said opening being tapered and threaded, a threaded stem located within the said opening, spring means, comprising an annular ring having an axial slot entirely therethrough, between the stem and the confines of the opening, interengaging means between the stem and the spring means whereby relative rotation causes adjustment therebetween, and interengaging means between the spring means and the surface of the opening, the last mentioned interengaging means being more resistant to rotative movement whereby application of rotative movement upon the stem will only cause the stem to rotate for the purpose described.

PAUL F. BERGMANN.
RALPH W. OSBORN.