March 31, 1925. 1,531,909

H. H. ENGEMANN

TAKE-UP DEVICE

Filed Nov. 6, 1923 3 Sheets-Sheet 1

Fig. 1.

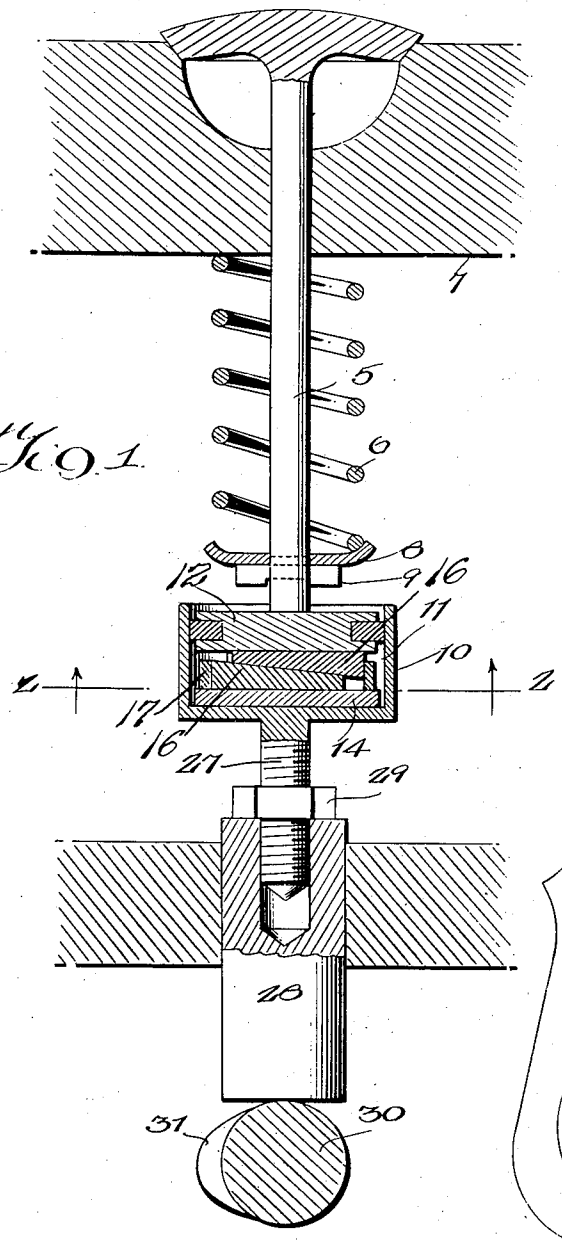


Fig. 2.

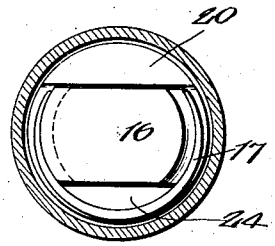
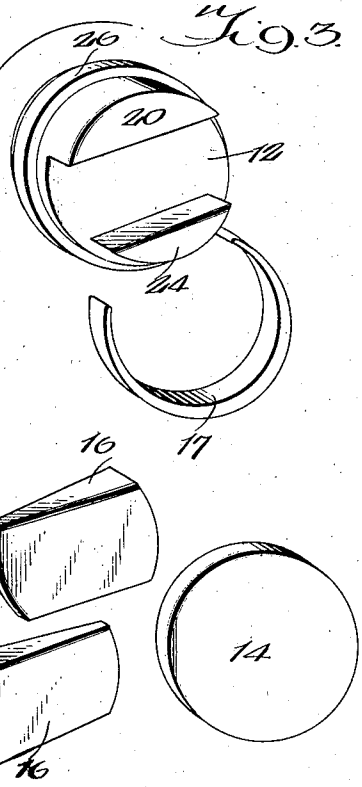


Fig. 3.



WITNESSES

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TAKE-UP DEVICE

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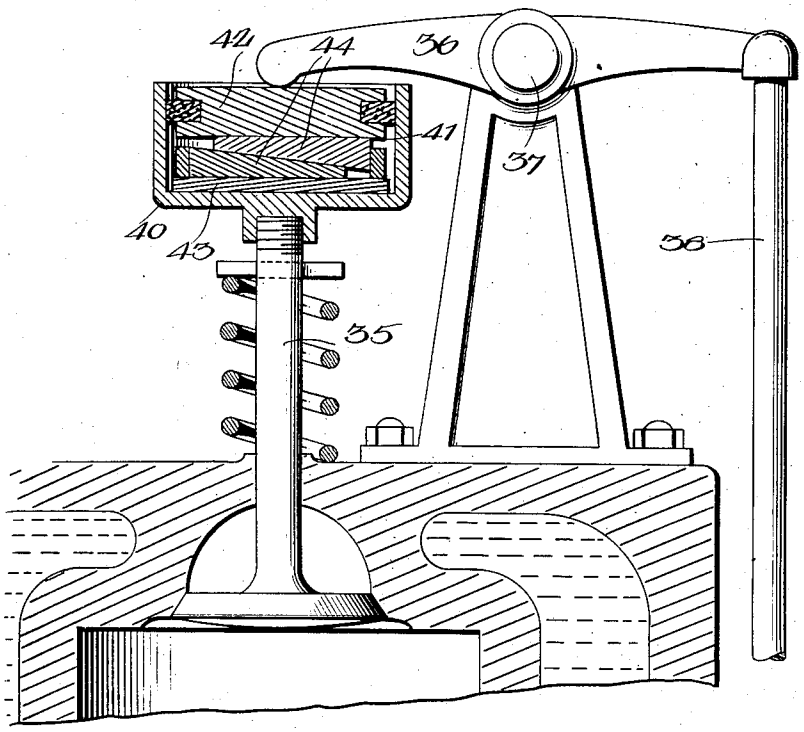


Fig. 4.

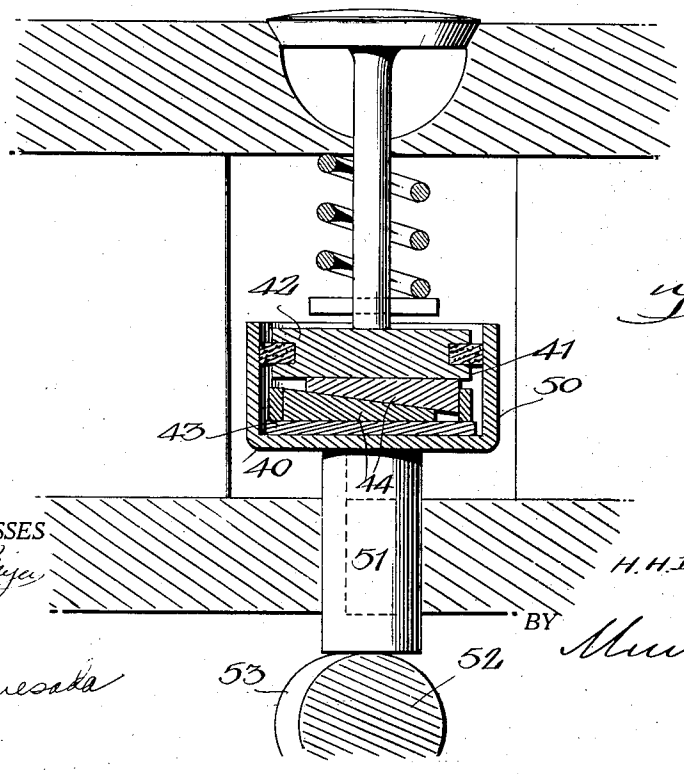


Fig. 5.

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Fig. 6.

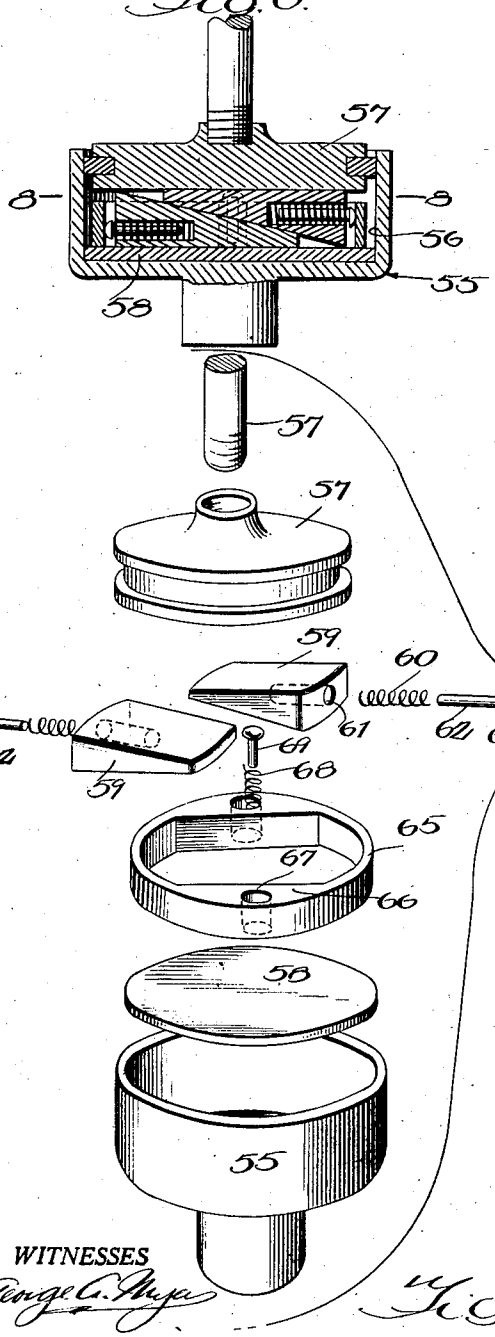


Fig. 8.

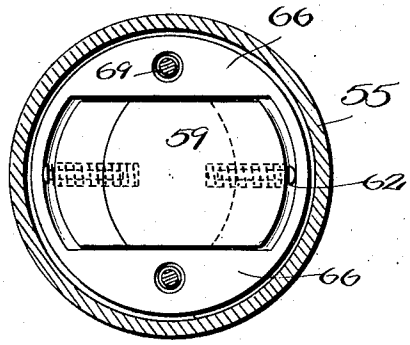


Fig. 9.

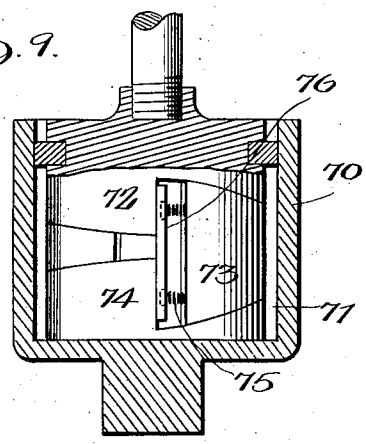


Fig. 10.

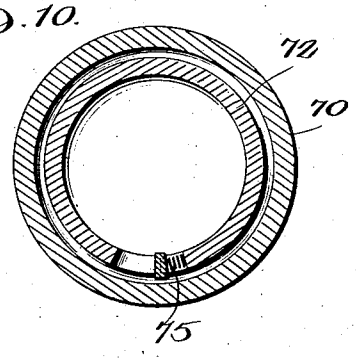


Fig. 7.

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Patented Mar. 31, 1925. 1,531,909

UNITED STATES PATENT OFFICE.

HERBERT HERMAN ENGEMANN, OF WAVERLY, MASSACHUSETTS.

TAKE-UP DEVICE.

Application filed November 6, 1923. Serial No. 673,217.

To all whom it may concern:

Be it known that I, HERBERT H. ENGEMANN, a citizen of the United States and resident of Waverly, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Take-Up Devices, of which the following is a specification.

This invention relates to automatic take-up devices especially adapted for use in connection with the valves of internal combustion engines.

An important object of this invention is to provide a take-up device for valves having simple means whereby the same may be incorporated in a valve assembly so as to automatically provide for expansion and contraction and to eliminate flapping of the valves.

A further object of the invention is to provide a take-up device which is of highly simplified construction, entirely automatic in operation and cheap to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing, forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a sectional view of the improved take up device applied.

Figure 2 is a horizontal sectional view taken on line 2—2 of Figure 1.

Figure 3 is a group perspective of the improved take-up mechanism.

Figure 4 is a vertical sectional view illustrating the improved take-up mechanism employed in connection with an overhead valve.

Figure 5 is a sectional view illustrating the take-up device mounted directly on the lifter.

Figure 6 is a vertical sectional view illustrating a modified form of invention.

Figure 7 is a group perspective illustrating the form of the invention shown in Figure 6.

Figure 8 is a horizontal sectional view taken on line 8—8 of Figure 6.

Figure 9 is a vertical sectional view illustrating a further modification of the invention, parts being shown in elevation.

Figure 10 is a horizontal sectional view through the form of the invention illustrated in Figure 9.

In the drawing the numeral 5 designates a valve of the usual and well known construction and around which a spring 6 is arranged. The spring 6 bears against the valve cage 7 and against the cap 8 held in place by the usual retainer 9.

The invention forming the subject matter of this application resides in the particular means for preventing slack in the operation of the valve and in providing for expansion and contraction.

With this in mind, I have provided a support 10 of cylindrical formation having a socket 11 for the reception of upper and lower disks 12 and 14 respectively.

With reference to Figure 2 it will be observed that a pair of similarly formed wedges or spacing members 16 are arranged in overlapping relation between the upper and lower disks and are urged together or in opposite directions by means of a split arcuate spring 17.

The arcuate spring is in turn held against rotation by the engagement of its ends with a lug or projection 20 on the under side of the upper disk 12. In other words the spring 17 is confined between the upper and lower disks and is held against rotation by the depending lug 20 on the under side of the upper disk. This prevents the ends of the spring 17 from engaging the ends of the wedges 16 and possibly sliding free of the ends of the wedges and permitting the wedges to separate.

Figure 3 illustrates that a second lug 24 is formed on the under side of a disk 12 opposite the lug 20 and cooperates in the formation of a groove for the reception of the wedges. It will be seen that the groove thus formed holds the wedges against lateral movement. Of course the depending lug 24 is spaced inwardly from the periphery of the upper disk 12 so that the spring 17 will not extend beyond the periphery of either the upper or lower disks.

A packing 26 is carried by the upper disk 12 and has an oil and dust proof connection or contact with the wall of the socket 11 and in this manner foreign matter is prevented from entering the socket and oil within the socket is prevented from escaping.

The support 10 is mounted on the upper

end of a threaded stem 27 extended into a lift 28 and a nut 29 may be employed for providing an adjustable connection between the members 27 and the lift 28. The usual cam shaft 30 is arranged beneath the member 28 and is provided with a lobe 31 by means of which the member 28 is periodically elevated.

It will be obvious that if the proper angle is chosen for the slope or inclination of the wedges the wedges will not slide back during the elevation of a valve. Should expansion take place in the valve, linkage or operating mechanism due to heat or other cause the spring 6 will tend to transmit a constantly acting force on the wedges urging the wedges apart so as to bring the washers or disks 12 and 14 together. However, the wedges are restrained from sliding apart by a spring 17 and the friction of the sliding surfaces. Yet the small vibration of the valve plates during action causes the wedges 16 to creep or move in such a manner as to bring the washers or plates closer together. If the angle of the sliding surfaces is properly chosen the rate of creep and consequently the rate of coming together of the washers or disks will exceed the rate of expansion of the valve linkage thus permitting the valve to close properly.

With reference to the foregoing it will be seen that the device will take up lost motion and yet provide a minimum clearance which is necessary to the proper functioning of poppet valves.

The invention forming the subject matter of this application may be carried out in connection with an overhead valve 35 which is actuated in the usual manner by a rocker arm 36. Of course the rocker arm is pivoted as indicated at 37 and is periodically operated by a push rod 38. In this form of the invention the support 40 is provided with a socket 41 within which the disks 42 and 43 are located and between the disks 42 and 43 the wedges 44 are located. The same mode of operation is present in this case as in the other form of the invention.

Also, the support which in Figure 5 is designated by the numeral 50 may be mounted directly upon the lift 51 which in turn is mounted upon a cam shaft 52 and is periodically elevated by a lobe 53.

Figures 6, 7 and 8 illustrate a further modification of the invention in which the support is designated by the numeral 55 and is provided with a socket 56 for the reception of upper and lower disks 57 and 58 respectively. A pair of cooperating wedges or spacing members 59 are arranged in overlapped relation between the disks or washers 57 and 58 respectively and are urged in opposite directions by means of coiled springs 60, the said coiled springs being extended into sockets 61 and being engaged with the inner walls of said sockets. The springs 60 receive the pins 62 having heads 63 engaged by the outer ends of the springs and said heads are also engaged with the inner wall of an annulus 65.

Figure 7 illustrates that the annulus 65 is provided with oppositely arranged thickened portions 66 having sockets 67 for the reception of coiled springs 68 and the springs receive pins 69. The pins 69 have heads engaged with the under sides of the upper disk 57 and consequently the annulus 65 is urged downwardly into engagement with the lower washer 58.

The operation of this form of the invention is believed to be obvious and it might be stated that the frictional part between the wedges and the strength of the springs 60 is relied on to prevent excessive separation of the wedges.

Figure 9 illustrates a further form of the invention wherein the support is designated by the numeral 70 and is provided with a socket 71 for the reception of three arcuate cams 72, 73 and 74. The cams 72, 73 and 74 when assembled form a cylinder and springs 75 are confined between the large end of the intermediate cam 73 and a contact strip 76 confined between the ends of the upper and lower cams 72 and 74. In this form of the invention also the springs are relied on to urge the valve stem or rod as the case may be into a position to reduce flapping to a minimum.

Having thus described the invention, what is claimed is:

1. A take-up mechanism for valves comprising a cylindrical support having a socket, spaced disks arranged in said socket, and overlapped wedges confined between said disks to maintain the same in spaced relation.

2. A take-up mechanism for valves comprising a support having a socket, spaced disks arranged in said socket overlapped wedges confined between said disks, and spring means for urging the wedges into overlapping relation.

3. A take-up mechanism for valves comprising a support having a socket, overlapped substantially disk shaped wedges arranged in said socket and yieldable means cooperable with the peripheries of said wedges for urging the wedges into overlapping relation.

4. A take-up mechanism for valves comprising a support having a cylindrical socket, disks arranged in said socket, wedges confined between said disks and arranged in overlapping relation and having their outer ends formed with longitudinal sockets, springs confined in said longitudinal sockets, and an annulus receiving said wedges and limiting the outward movement of said springs.

5. A take-up mechanism for valves comprising a support having a cylindrical socket, disks arranged in said socket, wedges confined between said disks and arranged in overlapping relation and having their outer ends formed with longitudinal sockets, springs confined in said longitudinal sockets, an annulus receiving said wedges and limiting the outward movement of said springs, and spring means to urge said annulus downwardly.

6. A take-up mechanism for valves comprising a support having a cylindrical socket, disks arranged in said socket, wedges confined between said disks and arranged in overlapping relation and having their outer ends formed with longitudinal sockets, springs confined in said longitudinal sockets, an annulus receiving said wedges and limiting the outward movement of said springs, spring means to urge said annulus downwardly, and a packing surrounding one of said disks and having a dust and oil tight connection with the wall of said socket.

HERBERT HERMAN ENGEMANN.