M. T. WILLEY.

VALVE STEM ATTACHMENT.

APPLICATION FILED MAR. 8, 1921.

1,420,898. Patented June 27, 1922.

Fig. 1.

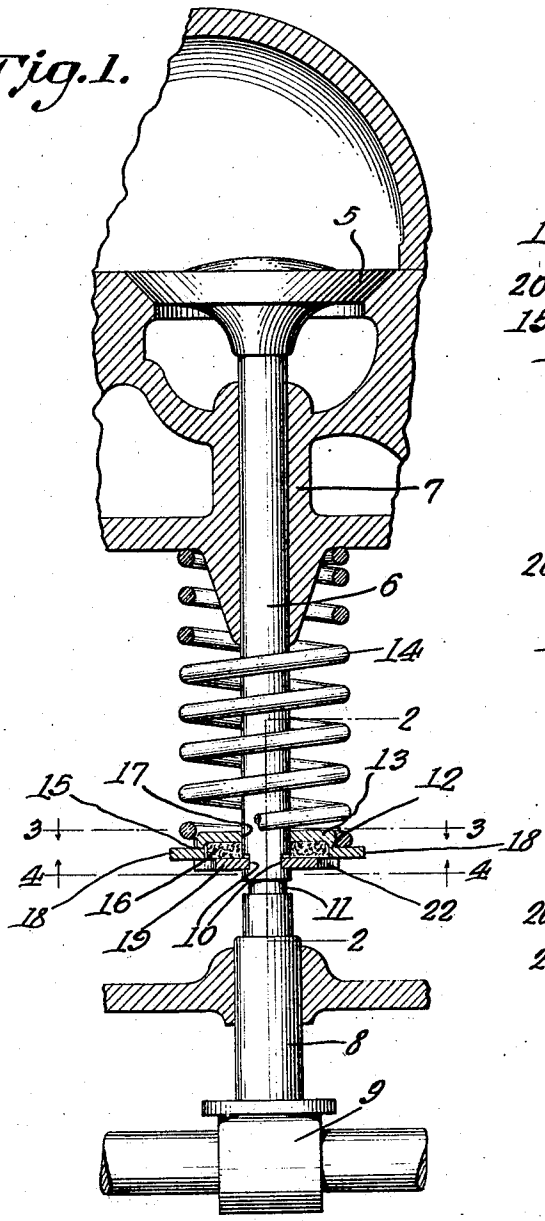
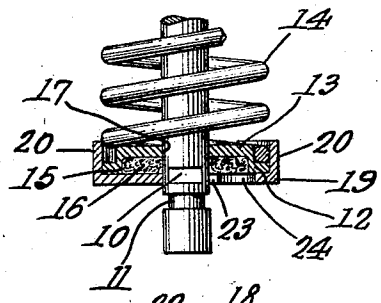


Fig. 2.



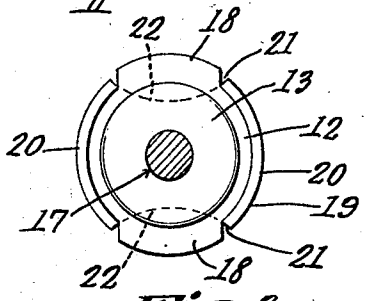


Fig. 3.

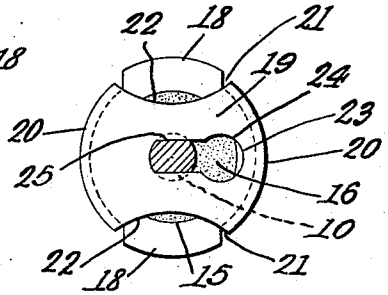


Fig. 4.

Inventor

Martin T. Willey

By

Attorney

UNITED STATES PATENT OFFICE.

MARTIN T. WILLEY, OF LEAD, SOUTH DAKOTA.

VALVE-STEM ATTACHMENT.

1,420,898. Specification of Letters Patent. **Patented June 27, 1922.**

Application filed March 8, 1921. Serial No. 450,518.

To all whom it may concern:

Be it known that MARTIN T. WILLEY, a citizen of the United States, residing at Lead, in the county of Lawrence and State of South Dakota, has invented certain new and useful Improvements in Valve-Stem Attachments, of which the following is a specification.

My invention relates to a device for connecting the stem of a valve, such as are employed upon internal combustion engines, with a spring, which spring serves to seat the valve, and has particular reference to improvements in devices of this character shown in my co-pending application for valve stem, Serial No. 279,287, filed May 6, 1920, which application has since matured into Patent No. 1,388,137, under date of Aug. 16, 1921.

An important object of the invention is to provide in a device of the above mentioned character, an inner member having means for holding the spring surrounding the valve stem, in proper concentric relation to the valve stem, and also for applying a lubricant to the valve stem, adjacent the locking device, whereby the locking device may be readily removed from the valve stem.

A further object of the invention is to provide a device of the above mentioned character, which is simple in construction, cheap to manufacture, strong and durable.

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

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

Figure 1 is a side elevation of a valve stem and associated elements, showing my improved device in section applied thereto,

Figure 2 is a sectional view of the device at a right angle to Figure 1, taken on line 2—2 of Figure 1, parts in elevation,

Figure 3 is a horizontal section taken on line 3—3 of Figure 1, and

Figure 4 is a similar view taken on line 4—4 of Figure 1.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a valve, of an internal combustion engine or the like, having a reciprocatory stem 6, operating through a sleeve 7. The lower end of the stem may contact with a cam plunger or rod 8, operated by a cam 9.

The stem 6 is provided near its lower or free end with diametrically oppositely arranged openings or notches 10, and an annular groove 11, as shown.

The numeral 12 designates an inner element or washer, having a central upwardly and inwardly bent portion, forming a boss 13, which is circular. This boss projects above the base of the inner member 12 and is adapted to enter the inner end of the compressible spring 14, surrounding the valve stem 6, and serving to seat the valve 5. The boss 13 is preferably pressed or stamped from the material of the inner member 12, and accordingly forms a lower recess or chamber 15, for receiving an annular fibrous member 16, preferably in the form of felt. This annular fibrous member is adapted to receive thereon a lubricant, such as oil, which is accordingly applied to the valve stem, adjacent the inner member or washer 12, whereby this member and associated elements may be readily removed from the valve stem, as hereinafter described. The boss 13 has a central opening 17, through which the valve stem 6 passes. The inner member or washer 12 is provided with diametrically oppositely arranged extensions 18, Figure 3, whereby the inner member may be moved upwardly, to compress the spring 14.

The numeral 19 designates an outer locking element or cap, having diametrically oppositely arranged members or flanges 20, which are segmental, and extend inwardly. These flanges receive the member or washer 12 therein, openings 21 being formed between the segmental flanges 20, for the passage of the extensions 18. The material of the cap 19 is also preferably cut away at 22, forming segmental recesses, thereby increasing the exposed area of the extensions 18, and allowing of a more convenient engagement of such extensions by a tool, or by the fingers, for compressing the spring 14, when desired. The locking element or cap 19 is provided with a key-hole opening 23, embodying an outer large circular portion 24, for the passage of the stem, and an inner radial straight contracted portion 25, the side walls of which are adapted for in-

sertion within the openings or notches 10 and the groove 11, to engage and interlock the valve stem with the edges thereof.

The operation of the device is as follows: With the part arranged as shown in Figure 1, when it is desired to release the valve stem (6) from the action of the spring, the extensions 18 of the inner member or washer 12 are engaged by a suitable tool, and moved upwardly, whereby the spring 14 is compressed. When the inner element 12 is moved upwardly sufficiently so that it clears the flanges 20, the locking element or cap 19 is then shifted laterally with respect to the element or washer 12, thereby bringing the outer large portion 24 of the key-hole opening in alignment with the stem 6. When this occurs the outer locking element or cap 19 is free to slide downwardly toward the free end of the stem, and may be removed therefrom, the stem being then released from locking engagement with the locking element or cap 19.

The opposite of this operation occurs when the device is being applied to the stem.

Particular attention is called to the fact that the fibrous annular member 16 is arranged within the chamber 15, between the inner element 12 and the outer locking element or cap 19 and the stem, and is therefore adapted to maintain these contacting parts suitably lubricated.

An important advantage of the device is that the parts thereof are locked together and locked to the stem in a manner to make accidental displacement impossible, but at the same time allowing of the quick and convenient separation of these parts, by exerting sufficient pressure upon the extensions 18 of the inner member, in a direction to compress the spring.

It is to be understod that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. An attachment for a valve stem having engaging means and a spring surrounding the stem, comprising an inner element having an inwardly extending boss for insertion within the spring surrounding the valve stem, said inwardly extending boss having an opening to receive the valve stem, and forming a recess upon the outer side of said inner element, which recess surrounds said opening, a fibrous element arranged within the recess and adapted to receive a lubricant, and an outer element provided with a key-hole opening, the large portion of the key-hole opening being arranged outwardly and adapted for the passage of the valve stem, the inner contracted portion of the key-hole opening being adapted to engage with said engaging means, said outer element having an inwardly extending member arranged near the large portion of the key-hole opening and adapted to engage with the inner member to normally prevent the outer member being shifted laterally in one direction with relation to the inner member.

2. An attachment for a valve stem having engaging means, comprising an inner element having an inwardly extending boss, said boss having an opening formed therein for the passage of the valve stem, said boss forming a recess upon the outer side of the inner element, said inner element having extensions, a fibrous member held within the recess and adapted to receive a lubricant, and an outer element engaging the inner element, the outer element having spaced inwardly extending members forming openings for receiving the extensions of the inner element, said outer element also having a key-hole opening extending between and transversely of the inwardly extending members, said key-hole opening having its outer large portion adapted to receive the valve stem and its inner contracted portion adapted to engage with said engaging means.

3. An attachment for a valve stem having engaging means and a spring surrounding the stem, comprising an inner element provided with a central boss extending inwardly therefrom to enter the spring surrounding the valve stem, said boss forming a recess upon the outer side of the inner element, said boss having a central opening for the passage of the valve stem, packing arranged within said recess said inner element having extensions, and an outer element engaging the inner element, said outer element having a pair of spaced inwardly projecting flanges forming openings for the reception of the extensions of the inner element and a key-hole opening, said key-hole opening having its large portion arranged outwardly to receive the valve stem and its contracted portion arranged inwardly to engage with said engaging means.

4. An attachment for a valve stem comprising an inner element having an inwardly extending boss provided with an opening for the passage of the valve stem, said boss forming a recess upon the outer side of the inner element, an outer element for detachable locking engagement with the stem and locking engagement with the inner element, and a fibrous member disposed within the recess between the inner and outer elements.

In testimony whereof I affix my signature.

MARTIN T. WILLEY.