March 29, 1932. C. J. MUZZY ET AL 1,851,681

VALVE SPRING LOCK INSERTER

Filed June 2, 1928

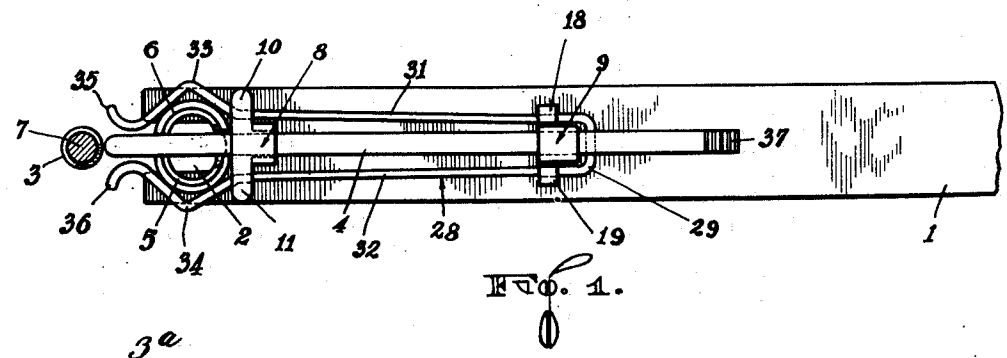

FIG. 1.

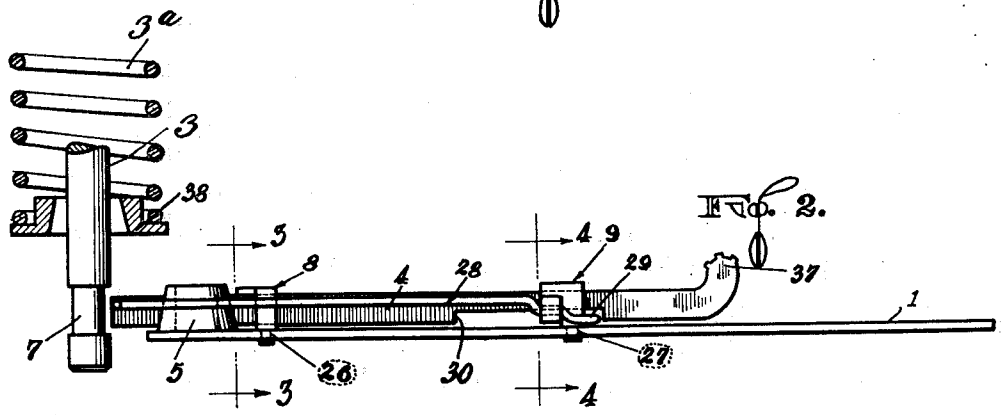

FIG. 2.

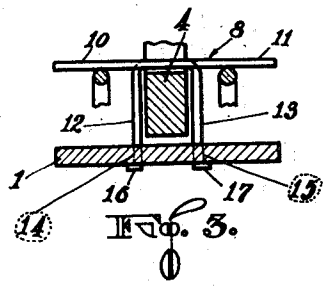

FIG. 3.

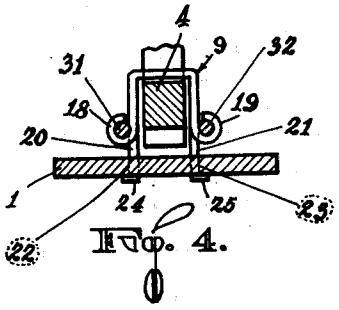

FIG. 4.

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UNITED STATES PATENT OFFICE

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VALVE SPRING LOCK INSERTER

Application filed June 2, 1928. Serial No. 282,433.

Our invention relates to improvements in valve spring key inserters commonly known as split keys, and it consists in the combinations, constructions, and arrangements hereinafter described and claimed.

An object of our invention is to provide a valve spring key inserter that employs in a single tool means for holding the two parts of the key and for keeping these parts separated from each other until they are moved upon the valve stem, whereby the tool can be removed, leaving the parts in adjusted position upon the stem. Tools of which we are aware for inserting valve spring keys do not hold the key parts separated from each other, and they do not absolutely prevent the key parts from falling down into the crank case. Considerable time, of course, is lost should a key drop into the crank case, in requiring the mechanic to fish it out.

A further object of our invention is to provide a device of the type described which is extremely simple in construction and which is thoroughly efficient for the purpose intended.

Other objects and advantages will appear as the specification proceeds, and the novel features will be particularly pointed out in the appended claims.

Our invention is illustrated in the accompanying drawings forming a part of this application, in which

Figure 1 is a top plan view of the device;

Figure 2 is a side elevation; and

Figures 3 and 4 are sections along the lines 3—3 and 4—4 of Figure 2.

In carrying out our invention, we provide a handle 1 that is flat and relatively long. One end of the handle has a recess 2 large enough to receive a valve stem 3 spring pressed by spring 3*a*. Upon the handle we slidably mount a bar 4 that is centrally disposed. One end of the bar normally bisects the recess 2 and extends beyond the handle. The bar is used for the purpose of keeping key parts 5 and 6 separated from each other. The bar is of the same width as the diameter of the reduced portion 7 of the stem 3 (see Figure 1).

Keepers 8 and 9 are used for slidably connecting the bar 4 to the handle 1. The keeper 8 is shown in Figures 1, 2 and 3, and it comprises a strip of metal that has outwardly-extending ears 10 and 11 lying flush with the top of the keeper, and legs 12 and 13 that are bent downwardly to straddle the bar 4. The legs are passed through openings 14 and 15 and have their ends bent over at 16 and 17 for securing the keeper in place. The purpose of the ears 10 and 11 will be hereinafter described.

The keeper 9 is shown in Figures 1, 2 and 4. Eyelets 18 and 19 are fashioned from the strip of metal forming the keeper 9, and legs 20 and 21 are also integral with the keeper and extend through openings 22 and 23 and have upset ends 24 and 25. The bar 4 slides through the keeper 9 as shown.

Figure 2 clearly shows how the legs of keepers 8 and 9 are provided with reduced portions 26 and 27 that extend through the openings in the handle 1. This construction, together with the upset ends of the legs, prevents vertical movement of the keepers with respect to the handle.

A U-shaped spring 28 straddles the keepers 8 and 9, and has its closed end 29 passed beneath the bar 4. Figure 2 shows how the closed portion is slidably received in a recess 30 cut into the bottom of the bar 4.

The leg 31 of the spring is passed through the eyelet 18 and beneath the ear 10, while the leg 32 is carried by the eyelet link and bears against the under surface of the ear 11. The eyelets urge the legs 31 and 32 toward each other, and the legs are provided with curved portions 33 and 34 respectively that yieldingly engage with the key parts 5 and 6. The ends of the legs 31 and 32 are curved outwardly at 35 and 36 for permitting them to receive the valve stem 3.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The key parts 5 and 6 are placed upon each side of the bar 4 and are held in place by the spring 28. The handle 1 is now moved toward the valve stem 3 for causing the stem to contact with the end of the bar 4 and to move the bar rearwardly until the stem is

received between the key parts 5 and 6. The legs 31 and 32 of the spring snap the key parts into place upon the reduced portion or groove 7. The bar 4 may now be retracted still further by placing the thumb upon the serrated end 37 and drawing rearwardly. This frees the bar from the keys and permits the spring legs to cause the key parts to encircle the reduced portion 7.

The washer 38 is now lowered upon the portions of the key parts 5 and 6 that project above the legs 31 and 32. The tool may now be removed and the key parts 5 and 6 will be prevented from falling due to the washer enclosing the tops of them. After the tool is removed, the washer may be moved downwardly until it is seated upon the key parts.

Although we have shown and described one embodiment of our invention, it is to be understood that the same is susceptible of various changes, and we reserve the right to employ such changes as may come within the scope of the appended claims.

We claim:

1. A valve spring key inserter for keys having a plurality of parts comprising a support for the keys and slidable means for keeping the key parts entirely free from each other.

2. A valve spring key inserter for keys having a plurality of parts comprising a support for the keys and slidable means for keeping the key parts separated from each other, said means being adapted to be moved when brought into contact with a valve stem for permitting the stem to be received between the key parts.

3. A valve spring key inserter for keys having a plurality of parts comprising a handle for supporting the key parts, a spacing member adapted to be disposed between the key parts and being of substantially the same width as the diameter of the valve stem, said member being movable by the stem when brought into contact with the stem and spring means for urging said key parts into position upon the stem when the member is retracted.

4. A valve spring key inserter for keys having a plurality of parts comprising a handle for supporting the key parts, a bar slidable thereon for spacing the key parts from each other, and spring means for urging the key parts toward each other.

5. A valve spring key inserter for keys having a plurality of parts comprising a handle, a bar slidable thereon for spacing the key parts from each other and spring means for urging the key parts toward each other, said bar being of substantially the same width as the diameter of a valve stem and adapted to be retracted by the stem when brought into contacting engagement with said stem whereby said spring means will urge the key parts against the stem.

6. A valve spring key inserter for keys having two parts of equal size comprising a key supporting member, means carried by said member for spacing the two halves of the key from each other, said spacing means being movable independently of said supporting member and being adapted to be moved when brought into contact with a valve stem for freeing the key halves from the spacing means and means for urging said key halves toward each other whereby said urging means will move the key halves into engagement with the valve stem.

7. A valve spring key inserter for keys having two segments comprising a key supporting member, means slidably mounted thereon for spacing the segments of the key from each other, by passing between the segments and means for urging the key segments toward each other.

8. A valve spring key inserter for keys having a number of segments comprising a key supporting member having a notch adapted to receive a valve stem, a bar slidably mounted on said member and being adapted to space segments of the key from each other and being slidable therebetween, yielding means for urging the key segments toward each other, said yielding means being mounted upon said member and being adapted to force the key segments against said slidable bar and said bar being adapted to be retracted when brought into contacting engagement with the valve stem, whereby said yielding means will urge the key segments against the stem.

9. A valve spring key inserter for keys consisting of a pair of parts, comprising means for spacing the two parts of the valve stem key and means for urging the two parts upon the spacing means, the said spacing means being retractible so as to yield and withdraw when pushed against a valve rod.

10. A device of the class described comprising a body element terminating in one bifurcated end, a tongue slidably disposed upon the body element, means limiting the movement of the tongue relative to the body element, a resilient split key holder pivotally secured to the body element and means for limiting the movement of the resilient split key holder relative to the body element.

11. A device of the class described, the combination of a one-piece body element terminating in a bifurcated head at one end, a tongue disposed central of the body element and adapted for limited movement longitudinally of the body element, spring means secured to the body element and lying at either side of the tongue and means for maintaining the side arms of the spring means in slidable engagement with the body element.

12. A device of the class described, the

combination of a bifurcated body element, a tongue disposed centrally of the body element and slidable relative thereto, spring means composed of two arms being hingedly secured to the body element, and means for maintaining the said arms of the spring means parallel to the body element.

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