Feb. 10, 1953 W. L. WISNER 2,627,653

VALVE SPRING COMPRESSOR

Filed July 25, 1949

Fig. 1.

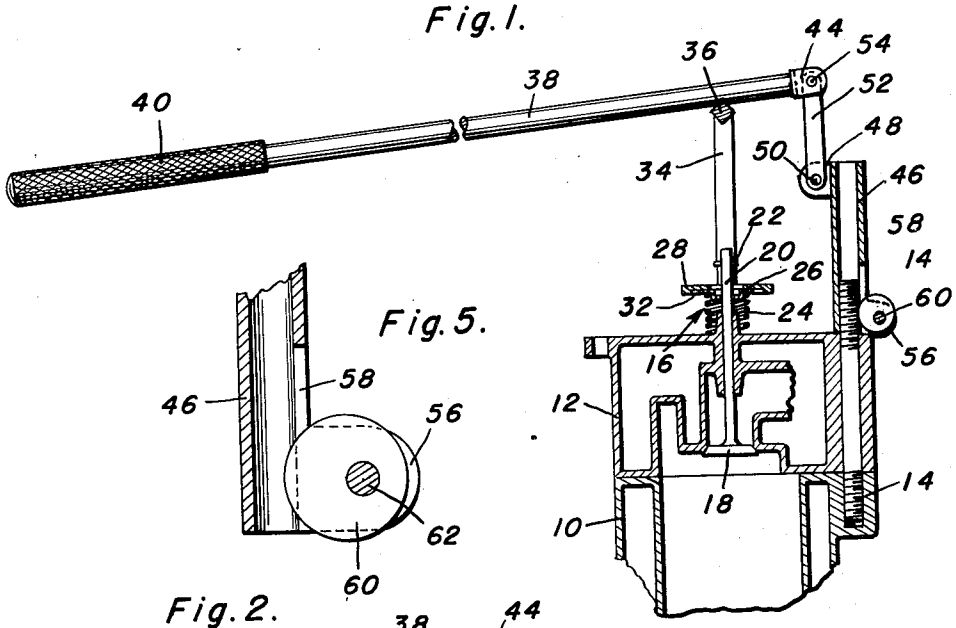


Fig. 5.

Fig. 2.

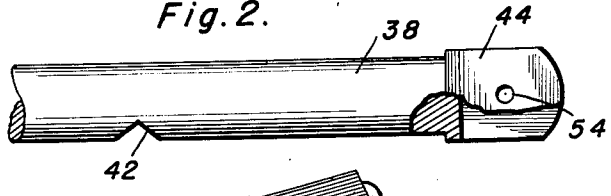


Fig. 3.

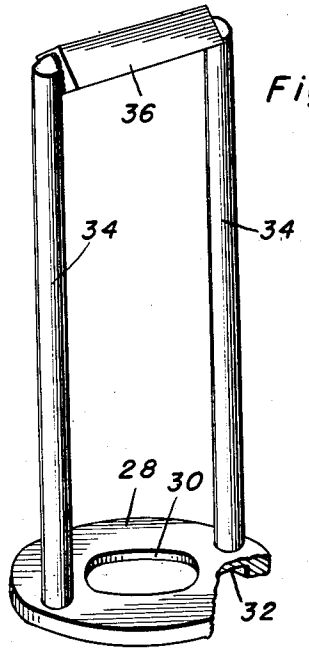
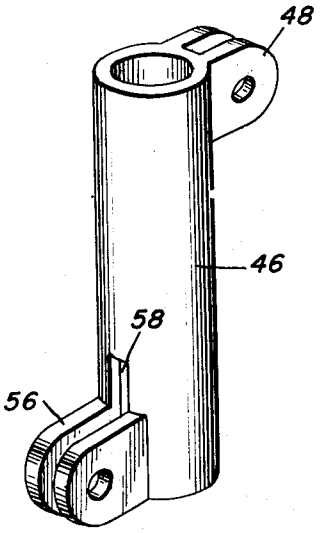


Fig. 4.



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VALVE SPRING COMPRESSOR

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3 Claims. (Cl. 29—220)

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This invention relates to a tool designed primarily for the purpose of compressing valve springs on engine heads to enable the easy removal and replacement of locks holding the valves and valve springs in place.

An important object of this invention is to provide a hand-operated valve spring compressor which may be easily assembled in proper position upon the cylinder block and which includes a novel means for releasably and lockingly retaining one end of the lever on the cylinder block stud, the locking engagement being effected in response to a downward pivotal movement of the handle portion of the lever so that the spring lock may be readily removed and the valve lifted.

Another important object of this invention is to provide a spring compressor of simple and inexpensive, yet highly efficient and durable construction which requires a minimum of effort to assemble.

And yet another object of this invention is to provide in a cylinder block having a valve in head and stud, a valve spring compressor comprising a bearing member adapted to engage the spring, a lever engaging member carried by and spaced from said bearing member, a hand lever bearing intermediate its ends on said lever engaging member, and a means for releasably and lockingly retaining one end of said lever on the stud.

These, together with various ancillary objects and features of the invention which will later become apparent as the following description proceeds, are attained by the device, a preferred embodiment of which has been illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a vertical sectional view through a cylinder head and valve illustrating the manner of employing the spring compressor of the instant invention, some parts of the latter being shown in elevation;

Figure 2 is a side elevational view, parts being broken away to show details of construction of the front end of the hand lever;

Figure 3 is a perspective view, parts being broken away to show details of construction, of the bearing member and associated fulcrum;

Figure 4 is a perspective view of the tubular member for securing the hand lever to the stud on the cylinder head; and

Figure 5 is a fragmentary vertical sectional view through the lower end of the tubular member and illustrating the cam lock.

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Specific reference will now be made to the drawings. In the several views, in the accompanying drawings and in the following specification, similar reference characters indicate corresponding elements throughout.

Indicated generally at 10 is a cylinder block to which the head 12 is secured by means of the conventional studs 14. A conventional valve in head 16 is provided including a valve 18, a stem 20, a lock 22 carried at the upper end of the stem, and a spring 24 around the stem interposed between the head and a spring retainer 26.

The tool or device of the instant invention comprises a bearing member 28, preferably in the form of a metallic disk, having a central aperture 30 for receiving the valve stem 20. The disk is further provided with an annular recess 32 for receiving the spring retainer 26 so that the bearing member can be properly positioned thereon and compress the spring 24 with a minimum of endwise movement. The disk 28 further carries a pair of diametrically opposed standards 34 between the tops of which are welded, riveted, or otherwise secured a preferably diamond-shaped lever engaging member 36.

An elongated hand lever 38 is provided having a knurled handle 40 at one end, and intermediate the ends of the lever is a V-notch 42 for receiving the lever engaging member 36. Several notches may be employed to allow for varying distances between the valve and stud.

The end 44 of the lever 38 opposite the knurled handle 40 is releasably and lockingly retained on the stud 14 of the cylinder head in a manner to be described immediately hereinafter. A tubular member 46 is provided having a pair of spaced laterally extending apertured ears 48 at its upper end for pivotally receiving, as at 50, a link 52 pivoted at its other end, as at 54, to the end 44 of the hand lever 38. At its bottom end, the tubular member 46 is provided with a pair of spaced, laterally extending apertured ears 56 which are diametrically opposite the apertured ears 48, and the tubular member 46 is provided with an elongated slot 58 extending between the apertured ears 56. A cam roller 60 is eccentrically pivoted, as at 62, between the ears 56 and is adapted to extend through the slot 58 to frictionally engage the stud 14 and lockingly retain the tubular member 46 on the stud.

In practical operation, the device is assembled on the cylinder head in a manner which will be readily understood by those skilled in the art. When a downward pressure is applied on the handle 40, the end 44 of the lever 38 will urge

the tubular member 46 upwardly and, in so doing, the cam roller 60 will move through the slot 58 and frictionally engage the stud 14. The greater the compression of the handle 40, the tighter will the cam roller bind against the stud and when this occurs the pressure will be applied directly against the engaging member 36, urging the bearing disk 28 against the spring retainer 26 and spring 24 to free the lock 20 so that the latter can be removed and the valve lifted. When the pressure on the handle 40 is released, the cam roller 60 will automatically move into an inoperative position to release the tubular member 46 from the stud 14.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a valve spring compressor including a bearing member adapted to engage the spring, an elongated lever and a member carried by said bearing member and engaging said lever intermediate its ends; the improvement comprising a means for removably and frictionally securing the lever on a cylinder block stud, said means including an elongated vertical tube adapted to slidably receive the stud, spaced lateral ears carried at the upper end of said tube, a second lever pivoted at one of its ends between said ears and at its other end to one end of said first-named lever, said tube having a longitudinal slot adjacent its lower end, and a cam roller eccentrically pivoted to said tube and adapted to extend through said slot and grip the stud in response to a downward pivotal movement of said first-named lever.

2. For use in conjunction with a bearing member adapted to engage and compress a valve spring; a tube adapted to be fitted telescopically over a cylinder block stud, a first lever adapted to rest intermediate its ends on said bearing member, a second lever pivotally joined at one end to said tube and pivotally joined at its opposite end to an adjacent end of said first lever, said tube having a longitudinal slot adjacent its lower end, and a cam eccentrically pivoted to said tube and having a portion extending into said slot.

3. For use in conjunction with a bearing member adapted to engage and compress a valve spring; a tube adapted to be fitted telescopically over a cylinder block stud, a first lever adapted to rest intermediate its ends on said bearing member, a pair of first ears carried at the upper end of said tube, a second lever pivotally joined at one end to said first ears and pivotally joined at its opposite end to an adjacent end of said first lever, said tube having a longitudinal slot in one side diametrically opposite to said first ears and opening through the lower end of said tube, a pair of second ears secured to said one side and disposed in spaced parallelism on opposite sides of said slot, and a cam eccentrically pivoted between said second ears and having a portion extending into side slot.

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