Sept. 12, 1933. G. L. KING 1,926,287

VALVE LOCK INSERTER

Filed May 31, 1932

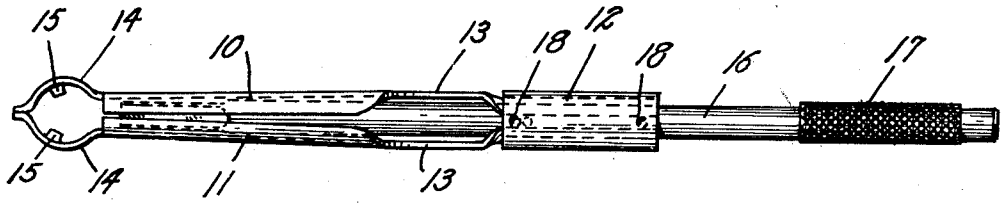


Fig. 1

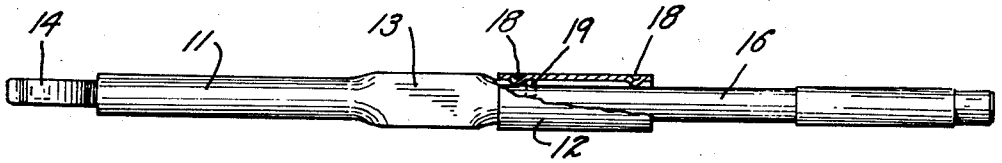


Fig. 2

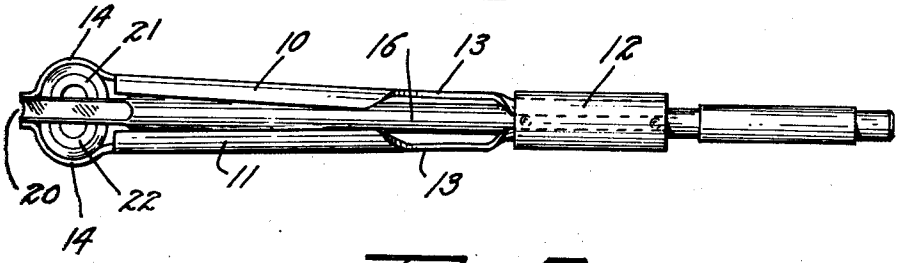


Fig. 3

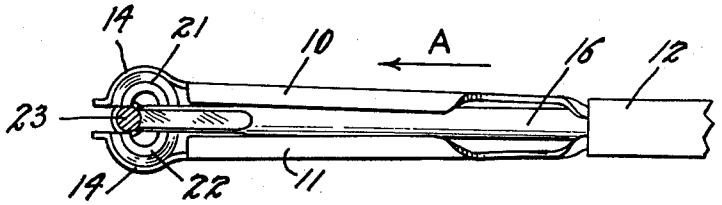


Fig. 4

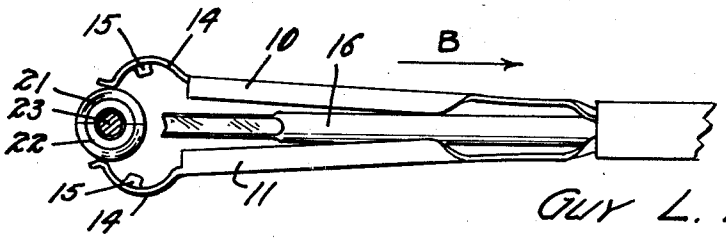


Fig. 5

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## VALVE LOCK INSERTER

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3 Claims. (Cl. 81—3)

In the modern type of automotive vehicle engine, the valve springs are held in place on the valve stems by means of a split cone which passes into the extremity of the spring and engages a groove around the valve stem. It is exceedingly difficult to replace these split cones owing to the close proximity of the valve stems, and other surrounding the mechanism.

This invention relates to a tool for replacing these cones and has for its principal object, the provision of a tool of this character with which the valve spring cone can be easily, quickly and accurately replaced.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

In the drawing:

Fig. 1 is a plan view of the improved valve spring cone replacing tool.

Fig. 2 is a side elevation thereof, partially broken away.

Fig. 3 is a plan view illustrating a valve spring cone in place in the tool.

Fig. 4 is a similar view illustrating the cone being positioned upon a valve stem.

Fig. 5 shows the tool being withdrawn after the cone is in place.

The tool comprises: a pair of oppositely positioned, semi-tubular, spring arms 10 and 11 secured in and projecting from a hollow sleeve 12. The spring arms are flattened intermediate their extremities, as shown at 13 to allow them to flex freely outwardly.

The outer extremities of the spring arms are narrowed and curved to form arcuate cone retaining jaws 14. Adjacent the bottom of each jaw, an inwardly projecting tooth 15 is formed.

A slide rod 16 slides through the sleeve 12 and projects between the spring arms 10 and 11. The slide rod 16 may be provided with a knurled portion 17 to facilitate holding. The tubular extremities of the arms 10 and 11 are separated within the sleeve 12 to leave a longitudinal channel, as indicated by the broken lines in Fig. 3. The forward and back movement of the slide rod is limited by means of two indentations 18 formed in the sleeve 12 so as to project into the channel between the two jaw members 10 and 11. A stud 19 projects from the slide rod into the channel and contacts with these indentations to limit the movement of the rod. The stud 19 also serves to prevent rotation of the rod 16 as it travels in the longitudinal channel between the parallel edges of the spring arms 10 and 11 within the sleeve 12. The forward extremity of the slide rod is square, as illustrated, and its extreme extremity is preferably formed with a vertical concavity as shown at 20.

Two halves of a split, spring-retaining, cone are illustrated at 21 and 22 and a typical valve stem is illustrated in cross section at 23. In use, the two halves 21 and 22 of the cone are placed on each side of the square extremity of the slide rod, which is projected as shown in Fig. 3, so that they will rest in the retaining jaws 14. In this position the two parts of the cone are separated and firmly held so that the tool can be inserted to reach the desired valve stem.

To place the cone upon the stem it is only necessary to place the extremity of the slide rod against the stem 23 as illustrated in Fig. 4. With the push rod firmly held against the valve stem, the sleeve 12, is pushed forwardly as indicated by the arrow "A", Fig. 4. This causes the spring arms to slide the two halves of the cone from the slide rod onto the valve stem. When the cone halves 21 and 22 reach their proper position, the natural resiliency in the spring arms will snap them firmly into place about the stem. The tool will retain the cone in place until the usual valve spring is lowered upon the cone. The valve spring will then lock the cone in place allowing the tool to be easily withdrawn as indicated by the arrow "B", Fig. 5.

The flat sides of the square extremity of the slide rod provide firm resting places for the flat sides of the halves of the split cone so that they can be firmly held thereon by the resiliency of the spring arms 10 and 11. The concavity 20 in the extremity of the slide rod facilitates placing it against the rounded side of the valve stem 23. It will be noted the square extremity of the slide rod is approximately the same thickness as the valve stem so that the cone halves can readily pass from the rod to the stem.

It is desired to call attention to the fact that the tool can be operated with one hand, leaving the other hand free to operate a valve spring retractor. The knurled extremity 17 of the slide rod can be held in the palm of the hand and the sleeve 12 pushed forward with the thumb and fingers.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is climed and desired secured by Letters Patent is:—

1. A tool for replacing split, valve spring retaining cones comprising: a pair of resilient arms; coacting jaws formed on one extremity of said arms; a semi-cylindrical portion formed on the other extremity of said arms; a cylindrical sleeve surrounding and secured to said semi-cylindrical portions so as to form the latter into a tubular member; and a slide rod passing through said tubular member and between said arms.

2. A tool for replacing split, valve spring retaining cones comprising: a pair of resilient arms; coacting jaws formed on one extremity of said arms; a semi-cylindrical portion formed on the other extremity of said arms; a cylindrical sleeve surrounding and secured to said semi-cylindrical portions so as to form the latter into a tubular member; said portions being spaced apart in said sleeve so as to form a longitudinal channel; and a projection on said rod travelling in said channel to prevent said rod from rotating.

3. A tool for replacing split, valve spring retaining cones comprising: a pair of resilient arms; coacting jaws formed on one extremity of said arms; a semi-cylindrical portion formed on the other extremity of said arms; a cylindrical sleeve surrounding and secured to said semi-cylindrical portions so as to form the latter into a tubular member; said portions being spaced apart in said sleeve so as to form a longitudinal channel; and a projection on said rod travelling in said channel to prevent said rod from rotating; and indentations in said sleeve extending into said channel to stop said projection and limit the extreme movement of said slide rod.

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