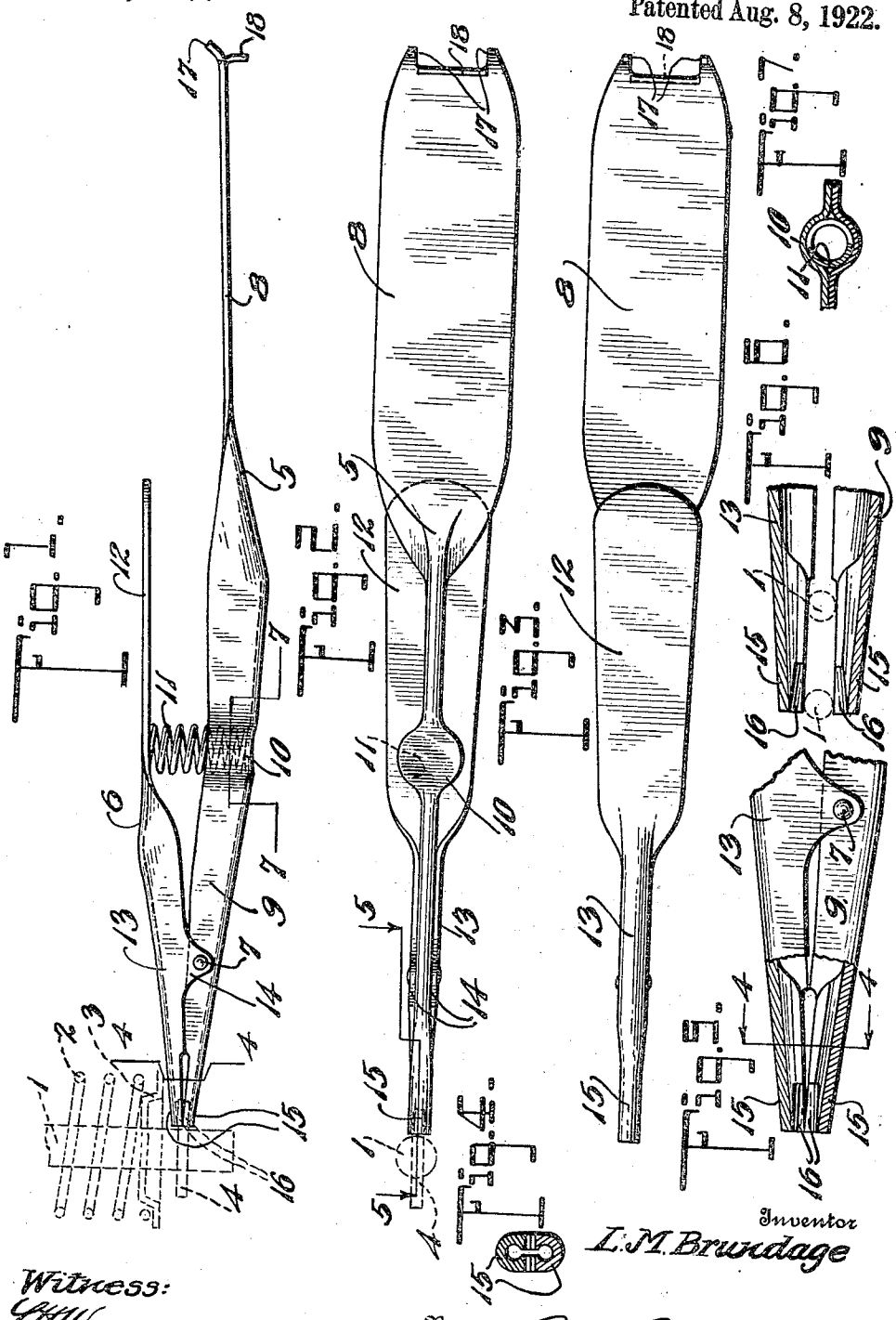
L. M. BRUNDAGE.

PIN INSERTER AND REMOVER.

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1,425,447.

Patented Aug. 8, 1922.



Witness:
E. K. Wagner.

Inventor
L. M. Brundage

By Robb, Robb & Hill
Attorneys

UNITED STATES PATENT OFFICE.

LOWELL M. BRUNDAGE, OF THOMPSON, PENNSYLVANIA.

PIN INSERTER AND REMOVER.

1,425,447. Specification of Letters Patent. Patented Aug. 8, 1922.

Application filed June 7, 1921. Serial No. 475,756.

To all whom it may concern:

Be it known that I, LOWELL M. BRUNDAGE, a citizen of the United States, residing at Thompson, in the county of Susquehanna and State of Pennsylvania, have invented certain new and useful Improvements in Pin Inserters and Removers, of which the following is a specification.

The present invention relates to tools for inserting and removing pins and has for its object to provide an improved tool of this character particularly adapted to the use of inserting and removing the valve stem pins of internal combustion engines, although it will be readily apparent that it is adapted for other uses such as removing and inserting cotter pins and the like.

This and such other objects as may hereinafter appear are attained by the novel construction, combination and arrangement of parts to be hereinafter specifically described and claimed. Reference will now be had to the accompanying drawings forming a part of this specification, wherein:

Figure 1 is a side elevation of my improved tool showing its application for removing a valve stem pin.

Figure 2 is a bottom plan view.

Figure 3 is a top plan view.

Figure 4 is a sectional view on the line 4—4 of Figure 1, looking in the direction of the arrows.

Figure 5 is a sectional view on the line 5—5 of Figure 2 looking in the direction of the arrows.

Figure 6 is a fragmentary sectional view of the end portions of the jaws showing them open and showing a pin in dotted lines extending transversely of the jaws, and

Figure 7 is a sectional view taken on the line 7—7 of Figure 1.

Throughout the following detailed description and on the several figures of the drawings, similar parts are referred to by like reference characters:

Referring to the drawings, the reference numeral 1 indicates a portion of a valve stem, 2 the spring surrounding the same, 3 the washer upon which the spring rests, and 4 the pin which cooperates with the washer to hold the spring assembled with the valve and for the insertion and removal of which my improved tool is especially designed.

The tool comprises a pair of sheet metal members 5 and 6 pivoted intermediate their ends at 7. The member 5 is formed from a flat strip of sheet metal of substantially uniform width from one end to about the middle of its length to form a handle portion 8 and then tapering to its other end. The tapered portion of the member 5 is folded upon itself to form a jaw 9 of double thickness and lying in a plane at right angles to the plane of the handle portion 8. The jaw 9 is so formed as to provide intermediate its ends a substantially cylindrical socket 10 for the reception of a strong coil spring 11.

The member 6 is shorter than the member 5, being of substantially the length of the jaw 9, and is also formed from a flat blank of sheet metal tapering from one end to the other and comprises a flat portion 12 corresponding to the handle portion 8 and a jaw 13 corresponding to the jaw 9 but only about half the length of the latter. The jaw 13 is provided intermediate its ends with integral lugs 14 and in forming the jaw the metal of the blank is not folded so that the sides of the jaw lie in contact with each other as in forming the jaw 9, but is so folded as to provide a sufficient space between the lugs 14 to receive the jaw 9. The pivot pin 7 extending through the lugs 14 and the jaw 9 forms a pivotal connection between the jaws. The flat portion 12 of the member 6 overlies the rear portion of the jaw 9 of the member 5 and its underside is engaged by one end of the coil spring 11 which normally maintains the tapered ends 15 of the jaws in contact with each other. These tapered ends terminate flush with each other and are reamed out so as to form substantially semi-cylindrical gripping surfaces 16. These gripping surfaces are preferably of a length to permit the jaws to take hold of just enough of the length of the valve stem pin so that when the pin is inserted in the valve stem by

means of the tool and the end of the latter comes into contact with the valve stem the pin will be substantially centered with respect thereto as clearly shown in Figure 1.

The end of the handle portion 8 of the member 5 is preferably formed with spaced lugs 17 and intermediate lug 18 formed by slitting the end of the handle portion 8 and bending the portion 17 in one direction and the portion 18 in the opposite direction. The lugs 17 are useful for engagement with the spaced recesses and the lug 18 for engagement in the groove or slot formed in the valve heads. The lug 18 also adapts the tool to function as a screw-driver.

In using the device the user will grasp the handle portion 8 and with his thumb will depress the portion 12 thus moving the tapered ends 15 of the jaws 9 and 13 away from each other in order to receive the end of a valve stem pin, cotter pin or the like between them. The user will then remove the pressure of his thumb against the portion 12 and allow the strong coil spring 11 to move the jaws into firm engagement with the pin to be inserted or removed. The semi-cylindrical pin-engaging surfaces adapt the tool to engage the end of a valve stem pin as illustrated in Figure 1, but the pin may readily be gripped between the jaws in the manner illustrated in Figure 6 with the pin extending transversely thereof.

If it is desired to grind valves my improved tool forms a convenient device for turning the valves. For this operation the user will insert the lugs 17 or 18 in the recesses or groove usually provided in the head of the valve and will use the jaw end of the tool as a handle portion.

It will be seen that by reason of the unique manner in which the jaws are formed by the folding of the metal that I have provided a tool of unusual strength. At the same time my improved tool is extremely simple in its construction, consisting of but the four elements, namely, the two sheet metal strips, the coil spring, and the pivot pin, and therefore is capable of manufacture at a relatively low cost.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A tool of the class described, comprising a pair of jaws pivotally connected intermediate their ends and having cooperating gripping surfaces at one end, each of said jaws having a flat portion integrally connected with the opposite end thereof and in a plane at right angles to the plane of said jaw, one of said jaws being longer than the other, the flat portion of the longer jaw forming a handle and the flat portion of the shorter jaw overlying the longer jaw and adapted to be moved towards the latter by pressure of the thumb, and a spring interposed between the longer jaw and the flat portion of the shorter jaw for urging said gripping surfaces towards each other.

2. A tool of the class described, comprising a pair of members formed from flat strips of sheet metal of unequal length, each of said members comprising a flat end portion and the metal of the other end portion of each member being folded upon itself to form a jaw, said jaws being pivotally connected intermediate their ends, the free ends of said jaws terminating flush with each other and provided with co-operating gripping surfaces, the flat portion of the longer member forming a handle portion and the flat portion of the shorter member overlying a portion of the jaw of the longer member, the jaw of the longer member being formed with a socket, and a coil spring located in said socket and abutting the under surface of the flat portion of the shorter member.

3. A tool of the class described, comprising a pair of members formed from flat strips of sheet metal of unequal length, each of said members comprising a flat end portion and the other end portion being folded to form a jaw lying in a plane at substantially right angles to the plane of the flat portion, the jaw of the longer member being formed with a socket and the jaw of the shorter member having spaced integral lugs to receive the jaw of the longer member between them, a pivot pin extending through said lugs and the jaw of the longer member, the flat portion of the shorter member overlying a portion of the jaw of the longer member, and a coil spring in said socket and abutting the under surface of the flat portion of the shorter member, the free ends of said jaws terminating flush with each other and being formed with cooperating gripping surfaces, the flat portion of the longer member forming a handle and the flat portion of the shorter member being operable by the thumb to move the gripping surfaces apart.

4. A tool of the class described, comprising a pair of members of unequal length pivotally connected intermediate their ends, said members being co-terminus at one end, said co-terminus end portions being formed with cooperating gripping surfaces, one of said members being provided with a socket, and a coil spring located in said socket and engaging the other of said members for urging said gripping surfaces towards each other, the end portion of the longer member extending beyond the shorter member forming a handle to be grasped by the fingers, and the corresponding end portion of the shorter member being operable by the thumb to move the gripping surfaces away from each other.

5. In a tool of the class described, a pair of jaws of unequal length, each U-shaped in

cross section and pivotally connected intermediate their ends, said jaws being co-terminus at one end, said co-terminus end portions being provided with cooperating gripping surfaces, each of said jaws being provided with a flat extension integrally connected with its opposite end and lying in a plane at substantially right angles to the plane of the jaw, and a coil spring interposed between the longer jaw and the flat extension of the shorter jaw for yieldingly holding said co-terminus end portions in contact with each other.

In testimony whereof I affix my signature.

LOWELL M. BRUNDAGE.