May 22, 1923. 1,456,007

F. C. HARTSON ET AL

VALVE STEM KEY TOOL

Filed April 28, 1921

Fig 1

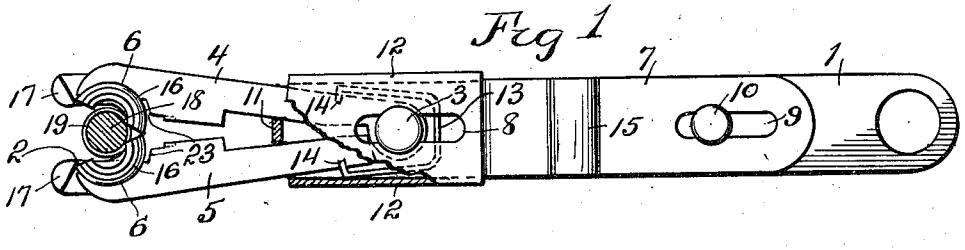


Fig 2

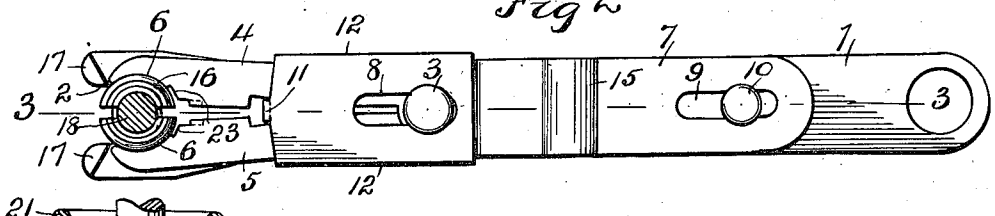


Fig 3

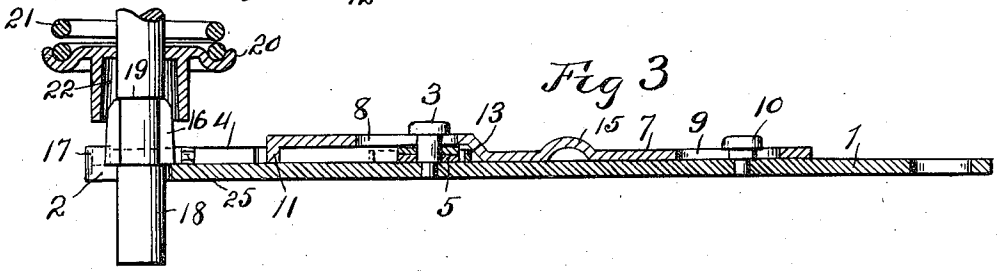


Fig 4

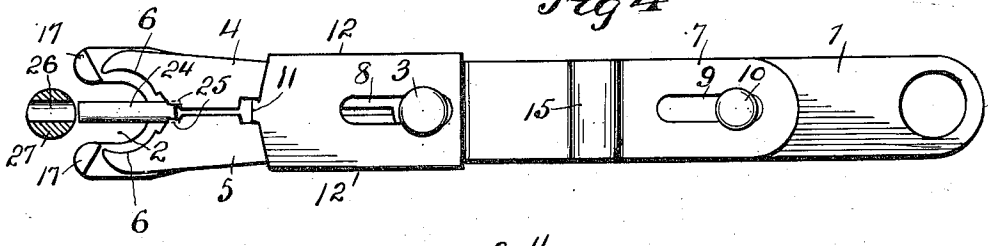


Fig 5

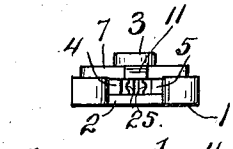
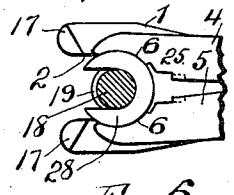


Fig 6



Witness:

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UNITED STATES PATENT OFFICE.

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VALVE-STEM-KEY TOOL.

Application filed April 28, 1921. Serial No. 465,307.

To all whom it may concern:

Be it known that we, FREDERICK C. HARTSON and GEORGE A. DONATH, citizens of the United States, residing, respectively, in Rosedale, in the county of Wyandotte and State of Kansas, and Kansas City, in the county of Jackson and State of Missouri, have invented a certain new and useful Improvement in Valve-Stem-Key Tools, of which the following is a specification.

Our invention relates to improvements in valve stem key tools.

The object of our invention is to provide a novel tool with which valve stem keys may be held and quickly removed from or applied to the stems of poppet valves, such as are in general use on automobile engines.

A further object of our invention, is to provide a tool of the kind described which is simple in construction, cheap to make, durable, not liable to get out of order, and which may be used to apply different kinds and shapes of keys to valve stems.

The novel features of our invention are hereinafter fully described and claimed.

In the accompanying drawing, which illustrates the preferred embodiment of our invention,

Fig. 1 is a plan view, partly broken away, of our improved tool, showing the jaws in the open position holding two members of a key in position to be applied to a valve stem, the latter being shown in cross section.

Fig. 2 is a view similar to Fig. 1, showing the jaws closed and the key members applied to the valve stem.

Fig. 3 is a vertical sectional view of the tool on the line 3—3 of Fig. 2, the lower spring seat, a portion of the spring, and a part of the stem and key being shown in operative relation-ship to the tool.

Fig. 4 is a view similar to Fig. 2, showing the jaws gripping a pin key, the stem for receiving the pin being shown in cross section.

Fig. 5 is a front end elevation of the tool.

Fig. 6 is a plan view of a portion of the tool, shown holding a key of the U-shape type applied to a stem which is shown in cross section.

Similar reference characters designate similar parts in the different views.

1 designates the shank of the tool, comprising a flat plate having at its front end a notch 2 adapted to receive a valve stem 18, Figs. 1, 2, 3 and 6.

Rigidly secured in the shank 1, is a pin 3, on which are pivoted two jaws 4 and 5, each of which is provided at its front and inner edge with an arcuate notch 6, adapted to receive and grip a valve stem key.

Longitudinally and slidably mounted on the shank 1, is a plate 7, having two longitudinal slots 8 and 9, through which respectively extend the pin 3 and a pin 10, which is rigidly secured in the plate 1. The heads of the pins 3 and 10 are wider than the slots 8 and 9 respectively and are disposed at the outer side of the slidable plate 7.

The front end of the plate 7, is provided with an inwardly extending projection 11, which slidably engages the inner edges of the jaws 4 and 5. When the plate 7 is slid rearwardly, the projection 11, which is forward of the pin 3, forces the jaws open.

For closing the jaws 4 and 5, opposite edges of the front portion of the plate 7 are provided respectively, with two flanges 12 which respectively slidably engage the outer edges of the jaws 4 and 5. By sliding the plate 7 forwardly, the flanges 12 force the jaws to the closed position so as to make the latter grip the valve key.

In order to assist the closing movement of the jaws, there may be provided a U-shaped spring 13 mounted between the shank 1 and plate 7, between the flanges 12, the arms of the spring being respectively provided with inwardly turned projections 14, Fig. 1, respectively mounted in slots provided therefor in the outer edges of the jaws 4 and 5.

For facilitating the sliding of the plate 7, it may have a raised portion 15 provided at any suitable place, as between the pins 3 and 10. By having the plate 7 slidable longitudinally of the shank 1, quick action of the jaws is obtained.

In order that a two part key, comprising two semi-circular members 16, such as is shown in Figs. 1 to 3, may be held while it is being applied to a stem, one side of the shank 1 is provided at opposite sides of the notch 2 with two projections 17, which extend laterally from one side of the shank and against which the key members 16 are adapted to bear, said members being supported also upon the shank 1, as shown in Figs. 1 to 3.

In applying the members 16, they are placed as shown in Fig. 1, with their rear edges bearing against each other and with their forward edges bearing respectively against the projections 17. The plate 7 is slid forwardly so as to close the jaws against the members 16, after which the tool is applied to the stem 18, which is provided with the usual peripheral groove 19 for receiving the members 16. The tool is forced forwardly until the stem 18 striking the members 16, and the plate 7 being pushed forwardly, causes the members 16 to be forced into the groove 19, as shown in Figs. 2 and 3.

The spring seat 20, Fig. 3, which has been previously lifted so as to compress the valve spring 21, to permit the insertion of the members 16, is then permitted to descend until the members 16 enter the recess 22, which is provided therefor in the under side of the seat 20, The latter being forced downwardly by the spring 21 will press downwardly the jaws 4 and 5, together with the shank 1, thereby forcing the members 16 out of the jaws, upon which the tool can then be withdrawn.

In order to permit the stem 18 to force the key members 16, from the open position shown in Fig. 1, to their operative position shown in Fig. 2, the inner edges of the jaws at the rear of the curved recesses 6, may be cut away as designated by 23.

In order that the jaws 4 and 5, may hold a key pin 24, Fig. 4, said jaws are respectively provided on their forward portions and inner edges, respectively, with two curved notches 25, Figs. 3 and 5, which notches are adapted to receive one end of the pin 24, as shown in Fig. 4. The other end of the pin may then be inserted into a transverse hole 26 provided in the valve stem 27, upon which the plate 7 is drawn rearwardly to release the pin from the jaws.

In Fig. 6, the tool is shown engaging a key 28 of the U-shape type, which is held upon the shank 1 by the curved portions 6 of the jaws, the jaws having been closed upon the key by forcing the plate 7 forwardly in the manner already described. After the key 28 has been mounted in the recess or groove 19, the spring seat is released so as to force the tool out of engagement with the key 28 in the manner already described with reference to the dislodgment of the key members 16, from the jaws.

We do not limit our invention to the structure shown and described, as many modifications within the scope of the appended claims may be made without departing from the spirit of our invention.

What we claim is:—

1. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem, two jaws pivoted to said shank and having means for gripping a valve key and applying it to a valve stem disposed in said notch, and means for opening and closing said jaws, substantially as set forth.

2. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem, two jaws pivoted to said shank and having means for gripping a valve key and applying it to a valve stem located in said notch, and a member slidable on the shank and arranged to open and close said jaws when said member is reciprocated on said shank, substantially as set forth.

3. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem, two jaws pivoted to said shank and adapted to grip a valve key and apply it to a valve stem located in said notch, and a member slidable longitudinally on the shank and engaging the inner and outer edges of said jaws, whereby the jaws are opened and closed when the member is reciprocated on the shank, substantially as set forth.

4. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem, the shank being adapted to support a valve key adjacent to said notch, two jaws pivoted to the shank and adapted to grip said key and apply it to a valve stem located in said notch, and means slidable on said shank and engaging said jaws for forcing the latter to the closed position, substantially as set forth.

5. A valve stem key tool comprising a shank having in one end a notch adapted to receive therein a valve stem, the shank being adapted to support a valve key adjacent to said notch, two jaws pivoted to the shank and adapted to grip said key and apply it to a valve stem, and a member slidable on the shank and having two flanges respectively slidably engaging the outer edges of said jaws, and having a projection slidably engaging the inner edges of said jaws, substantially as set forth.

6. A valve stem key tool comprising a shank having means for engaging a valve stem, two jaws pivoted thereto and adapted to grip a valve key and apply it to a valve stem, and means slidable lengthwise of the shank for swinging said jaws in one direction, substantially as set forth.

7. A valve stem key tool comprising a shank having means for engaging a valve stem, two jaws pivoted thereto and adapted to grip a valve key and apply it to a valve stem, and means slidable lengthwise of the shank for opening and closing said jaws, substantially as set forth.

8. A valve stem key tool comprising a shank having means for engaging a valve stem, two jaws pivoted thereto and adapted to grip a valve key and apply it to a valve

stem, and a member slidable lengthwise of the shank and slidably engaging the outer edges of the jaws, substantially as set forth.

9. A valve stem key tool comprising a shank, two jaws pivoted thereto and adapted to grip a valve key and apply it to a valve stem, and a member slidable lengthwise of the shank and slidably engaging the inner edges of said jaws, substantially as set forth.

10. A valve stem key tool comprising a shank, two jaws pivoted thereto and adapted to grip a valve key and apply it to a valve stem, and a member slidable lengthwise of the shank and slidably engaging the inner and outer edges of said jaws, substantially as set forth.

11. A valve stem key tool comprising a shank, having in one end a notch adapted to receive a valve stem and having on one side at opposite sides respectively of said notch two projections adapted to respectively engage two members of a valve key, two jaws pivoted to said shank and adapted to grip said two key members, and means for opening and closing said jaws, substantially as set forth.

12. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem and having on one side at opposite sides respectively of said notch two projections adapted to respectively engage two members of a valve key, two jaws pivoted to said shank adapted to grip said two members, and means slidable on the shank for closing said jaws, substantially as set forth.

13. A valve stem key tool comprising a shank having in one end a notch adapted to receive a valve stem and having on one side at opposite sides respectively of said notch two projections adapted to respectively engage two members of a valve key, two jaws pivoted to said shank adapted to grip said two members and apply them to the valve stem, and means slidably engaging the shank and the inner and outer edges of said jaws for opening and closing the jaws, substantially as set forth.

In testimony whereof we have signed our names to this specification.

FREDERICK C. HARTSON.
GEORGE A. DONATH.