

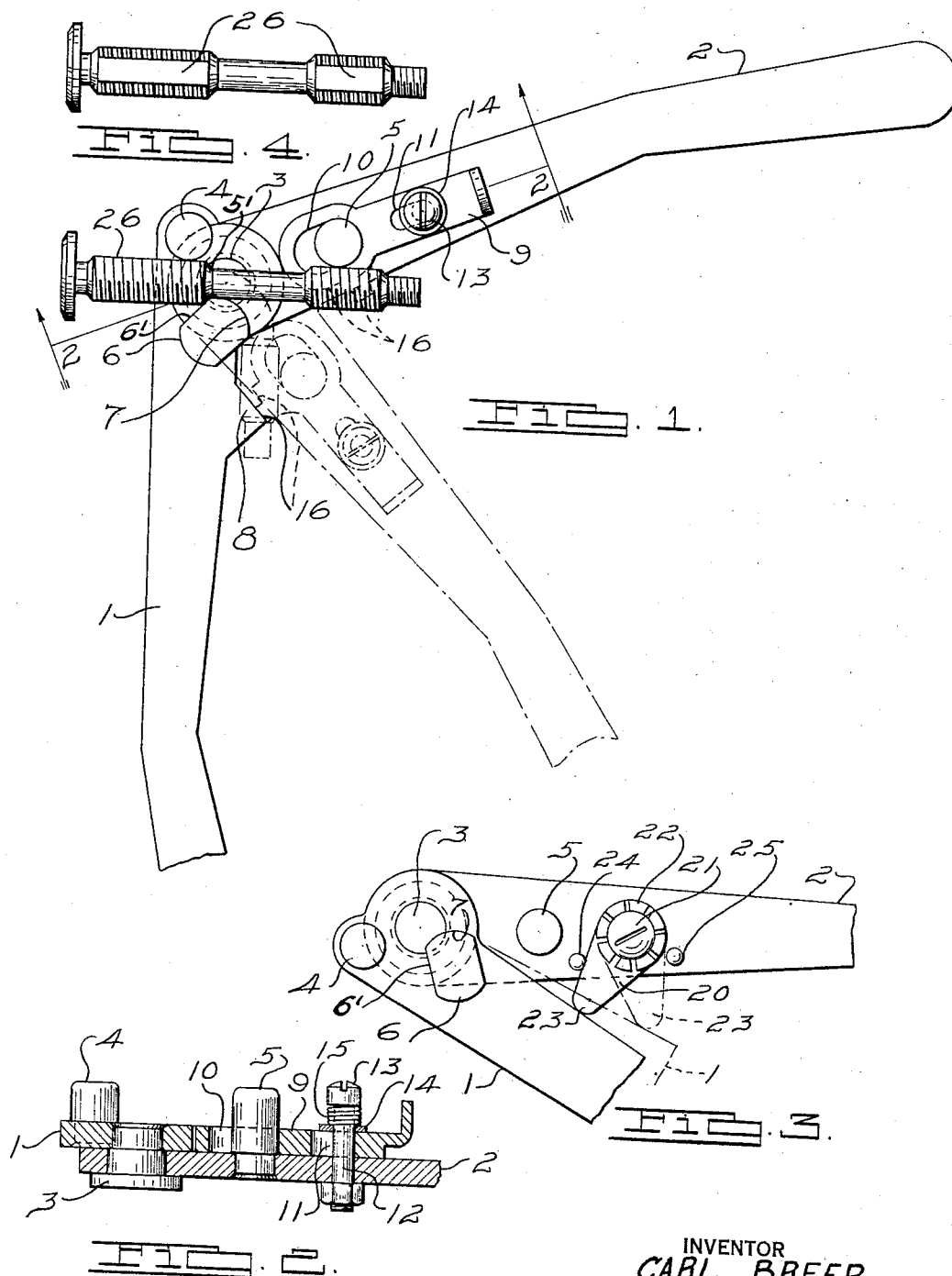
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BENDING TOOL

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BENDING TOOL

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This invention relates to a tool or accessory of the connection shown in my co-pending application Serial #454,485, filed May 21, 1930 which will enable dealers to bend a valve stem from a straight to an angular form, if required by the consumer.

It is desirable that tire dealers, to meet the demands of the trade, be equipped with a tool for bending a straight valve stem to an angular form. The introduction of the disk wheel, for reasons not necessary to enumerate, has brought about this requirement, the main essential being that the user be able to locate the valve stem in a position accessible for inflation purposes from the outside of the wheel. To avoid the necessity of supplying the dealer with two complete sets of inner tubes and tying up capital without increase of return, the present invention provides a tool for readily bending straight valve stems that have been secured to the inner tube previously, usually at the factory, from the straight form to an angular form, as occasion may require. It aims to provide a practical, efficient and inexpensive tool for such bending of valve stems without requiring their removal from the inner tubes; one that may be operated manually, at least by preference, and is accurate and reliable in service.

An embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a plan view of the tool, showing in solid lines the position of the arms with a straight valve stem ready to be bent, and in dotted lines the position of the parts after the valve stem has been bent, the inner tube being omitted for the sake of clearness;

Fig. 2 is a cross section through the tool on the line 2—2, Fig. 1;

Fig. 3 is a plan view of a modification;

Fig. 4 is a plan view of a usual form of straight valve stem, showing one of its two slabbed faces.

As shown in the drawing, the tool com-

prises a pair of arms 1 and 2, which are pivoted or fulcrumed, as indicated at 3, the remote ends of the arms being free for manual manipulation. On the arm 1, in one direction from the pivot or fulcrum pin 3, is located a lug or pin 4, projecting laterally therefrom. A similar upstanding lug or pin 5 is fixed to the arm 2, in a direction opposite from the fulcrum 3. That is to say, the pivot or fulcrum pin 3 is nearer the free ends of the arms 1 and 2 than the lug 4, but farther than the second lug 5. These lugs are preferably, but not necessarily, rounded, as shown, and may be fixed to the arms in any suitable manner. Of course, if desired, the lugs 4 and 5 may be in the form of rolls. On the arm 1, adjacent the pivot 3, is located a lug or arbor 6, preferably having a curved face 7 approximating the bend that is to be made in the valve stem. This arbor lug may be fixed in any suitable manner to the arm 1.

Means are preferably provided to limit or stop the approach of the arms 1 and 2. Any suitable devices may be employed. In the drawing, in Figs. 1 and 3, respectively, two forms of a stop are disclosed.

Referring for the present to Fig. 1, the arm 1 is shown provided with a projection or offset 8, and the arm 2 with a plate 9, provided with slots 10 and 11, the former of which embraces the lug 5, and the latter of which encloses the shank of a bolt 12, between the head 13 of which bolt and a washer 14, is confined a spring 15 under tension and thereby frictionally holding the plate 9 in any adjusted position. When the plate 9 has been shifted as far in one direction as the slots 10 and 11 permit, one of the abutment faces 16 is presented for cooperation with the offset 8, and when the plate 9 is moved to the opposite extreme, the other of the faces 16 is presented for cooperation with the portion 8 on the arm 1.

In Fig. 3 of the drawing, another and simpler construction of stop is illustrated.

As seen by a scrutiny of this figure of the drawing, it comprises a plate 20, fulcrumed about the axis of the screw 21, between the head of which screw and the plate 20 is interposed a spring or friction washer 22. The plate 20 may be moved in either direction about its fulcrum pin 21 so as to locate its nose 23 in either of the positions indicated in Fig. 3 and in the path of the other arm, such location being determined by the position of the pins 24 and 25, flanking the plate 20. In this modified form of construction, as in the other, the tool is adapted to bend either of the two sizes or types of valve stems that are in general use at the present time. Obviously, the principle of these stops limiting movement of the arms 1 and 2 toward each other might be extended to permit of stopping the movements of the arms in any number of desired positions relative one to another.

The manner of using the device is obvious from the drawing.

The tool of the present invention is intended for bending valve stems which have been previously reduced intermediately by machining off the central portion of their threads, as indicated in the drawing, or are provided with threads only in the immediate vicinity of the junction of the valve stem with the inner tube. Usually, the valve stems are lengthwise slabbed off to form a pair of oppositely disposed flat faces 26.

In operation, the valve stem is inserted between the lugs 4 and 6 and positioned so that the peripheral face of the lug 4 engages the flat face 26 of the threaded shank of the valve stem and the planular side 6' of the lug 6 engages the inclined shoulder 5' of the valve stem. The rounded extremity 7 of the lug 6 bears against the reduced intermediate portion of the valve stem at a point adjacent the shoulder 5'. The lugs 4 and 6 are thus located on the respectively opposite sides of the valve stem and the lug 5 of the arm 2 engages only the upper side of the valve as shown in Fig. 1. As the arms 1 and 2 are brought together, the lug 5 bends the reduced intermediate portion of the valve stem around the rounded extremity 7 of the lug 6. During this bending operation the planular face 6' of the lug 6 secures the valve stem against axial movement and the engagement between the flat side face 26 and the lug 4 prevents the valve stem from rotating.

With the above construction, the threads of the valve stem are protected during the bending operation and the outer part of the valve stem is bent in a predetermined direction with respect to the flat side faces on the respectively opposite sides of the valve stem.

It will be understood that the invention is capable of application in wide variety of forms other than those disclosed in the drawing and that it is not intended to be limited

to details hereinbefore described and illustrated. Reference should therefore be made to the accompanying claims for an understanding of the scope of the invention.

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

1. In a tool for bending threaded valve stems which have a longitudinal flat side face and a peripheral shoulder, a pair of pivotally connected arms, a pair of lugs on one of said arms, one having a flat side for engaging said shoulder at a point opposite from said flat face and a rounded extremity for engaging the intermediate portion of said valve stem, the other lug having a side arranged for receiving said flat face, and means on the other arm for engaging said valve stem only on one side so as to bend the latter upon said rounded extremity.

2. In a tool for bending threaded valve stems which have a longitudinal flat face and a peripheral shoulder inclined with respect to said flat face, a pair of pivotally connected arms, a pair of lugs on one of said arms, one lug having an edge for receiving said flat face, the other lug having a flat side inclined with respect to said edge and having a rounded extremity for engaging the intermediate portion of said valve stem, and means on the other arm for engaging said valve stem on one side so as to bend the latter upon said rounded extremity.

3. In a tool for bending threaded valve stems which have a longitudinal flat side face and a peripheral shoulder, a pair of pivotally connected arms, a pair of lugs on one of said arms, one lug having a flat side for engaging said shoulder at a point opposite from said flat face and a rounded extremity for engaging the intermediate portion of said valve stem, the other lug having a side arranged for receiving said flat face, and means on the other arm for coacting with said valve stem so as to bend the latter upon said rounded extremity.

4. The method of bending a tire valve stem having a threaded shank portion provided with longitudinal, opposite flat faces, a reduced portion and a shoulder at the junction of said portions, said method comprising disposing said shank portion between a pair of jaws, engaging the shoulder on the valve stem to secure it against axial movement in one direction, engaging the valve stem at a location spaced from the shank portion and applying force to the valve stem at said location to bend the valve stem around the shoulder-engaging point as a fulcrum.

5. The method of bending a tire valve stem having a threaded shank portion provided with longitudinal, opposite flat faces, a reduced portion and a tapered shoulder between said portions, said method comprising en-

gaging said shank portion at its flat sides to prevent rotational movement of the valve stem about its axis, engaging the tapered shoulder on the valve stem to secure the valve stem against axial movement in one direction, engaging the valve stem at a location spaced from the shank portion beyond the tapered shoulder and applying force to the valve stem at said location to bend it around the shoulder-engaging point as a fulcrum.

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