March 28, 1933. G. A. MORGAN 1,902,881

VALVE BENDING TOOL

Filed Sept. 10, 1930

Fig. 1.

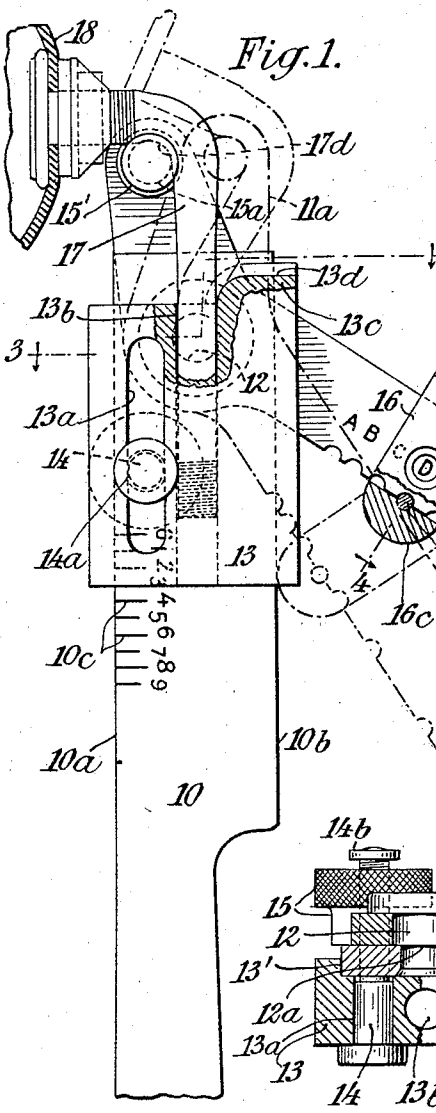


Fig. 4.

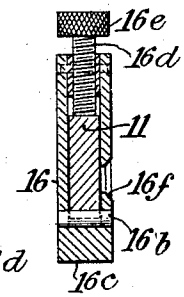


Fig. 2.

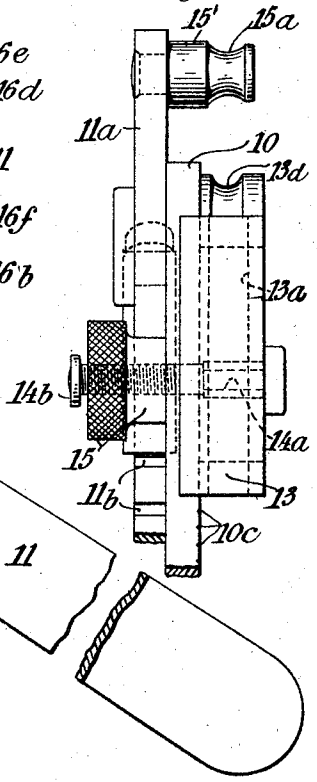


Fig. 3.

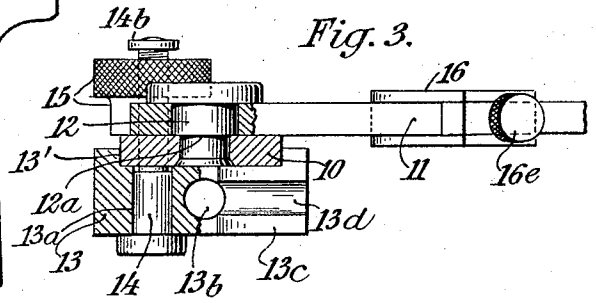
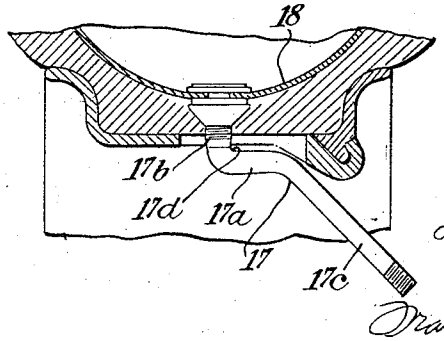


Fig. 5.



INVENTOR :

Gerry A. Morgan,

By Attorneys,

Fraser, Myers & Manley.

Patented Mar. 28, 1933 1,902,881

UNITED STATES PATENT OFFICE

GERRY A. MORGAN, OF GARDEN CITY, NEW YORK, ASSIGNOR TO A. SCHRADER'S SON, INCORPORATED, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK

VALVE BENDING TOOL

Application filed September 10, 1930. Serial No. 480,858.

The present invention relates to valve stem bending tools and aims to provide certain improvements therein.

It is well known that certain vehicle wheels and certain types of tire rims require the tire mounted thereon to have a special bend or angle valve stem in order that the tire may be conveniently inflated, deflated and gauged. It is also well known that it is impracticable for tire dealers and service stations to carry complete lines of tires with such bent stems, hence the difficulty and inconvenience frequently experienced by motorists in obtaining quick replacement of inner tubes having bent valve stems. This is particularly true with respect to inner tubes, the valve stems of which have a double bend.

To overcome this difficulty and inconvenience it has been proposed that the tire manufacturer equip the inner tube with a short valve stem or spud and that the dealers and service stations carry in stock a supply of extensions—straight and bent—for cooperation with said spuds, whereby any desired size of tube can be supplied with any desired length and shape of valve stem. It has also been proposed that the tire manufacturers equip the inner tubes with straight stems and that dealers and service stations be supplied with tools for bending these stems to desired shapes. The tools heretofore proposed for bending valve stems with which I am familiar, are not capable of imparting a double bend to a valve stem, nor are they of such construction as would lend themselves to modifications for accomplishing this end. This is particularly so because of the necessity of providing, in addition to a bend of definite angle, an offset portion which will have a different length from the first bend for different rims.

According to the present invention I provide a valve bending tool which is adapted for forming the second bend in a valve stem. Preferably, however, the tool is intended for use on valve stems which already have a substantially right-angle bend in proximity to the tube-engaging end of the stem, said tool having adjustable means for governing both the length of the offset portion and the angle of the second bend. The invention also contemplates other features of novelty which will be understood from the detailed description which follows.

In the accompanying drawing I have illustrated a preferred embodiment of my invention, wherein

Figure 1 is an elevation of a valve bending tool according to the present invention showing the manner of its operation upon a valve stem, certain parts of the construction being shown in section.

Fig. 2 is a fractional side elevation of the tool when viewed from the left of Fig. 1.

Fig. 3 is a section taken substantially along the broken line 3—3 of Fig. 1.

Fig. 4 is a transverse section taken substantially along the line 4—4 of Fig. 1.

Fig. 5 is a fractional transverse section of a tire and rim, the inner tube of the tire having a double bent valve fitted thereto.

Referring to the drawing, the tool illustrated, which is in the form of a portable tool, comprises a pair of operating, flat arms or members 10 and 11 which are pivotally connected together in proximity to their adjacent ends through the medium of a rivet 12, said rivet having a shoulder 12*a* bearing against one face of the member 10 whereby to provide a guide for insuring relative movement of the members in a definite plane.

The member 10 near its pivoted end is provided with parallel sides 10*a* and 10*b* and slidably mounted over the top face of said member is a block 13, the inner face of which is grooved, as shown at 13′, to engage the sides 10*a* and 10*b*. The block 13 is formed with a longitudinal slot 13*a* therein through which extends a headed bolt 14 having its shank below its head provided with opposite flat faces 14*a* which hold the bolt against rotation within said slot. The bolt 14 passes through a hole in the member 10 and screw-threadedly carries a knurled clamping nut 15, the inner face of which is adapted to engage the flat face of the member 10 opposite to that upon which

the slide 13 is movable. To prevent loss or separation of the knurled nut 15 from the threaded end of the bolt 14, said end is upset or enlarged, as shown at 14*b*. Tightening of the knurled nut 15 upon the bolt 14 will clamp the slide block 13 against movement on the member 10. The elongated slot 13*a* in the slide block will limit the extent of the movement or adjustment of the slide block with respect to the member 10. The slide block 13 is also provided with an opening 13*b* extending longitudinally therethrough and parallel to the slot 13*a*. At the top of the block 13 at one side of the opening 13*b* is a projection 13*c* having in its top a grooved, curved surface 13*d* leading from the opening 13*b*, the cross-section of said curved surface being substantially semi-circular in form. The opening 13*b* is adapted to accommodate the inflating end of a valve stem which is to be bent, and the surface 13*d* is adapted to function as the bending surface or template over which said stem is to be bent, as will be presently made apparent.

The member 11 at it pivoted end is formed with an offset portion 11*a* and is provided with a cylindrical lug 15′ which projects inwardly over the member 10, as best shown in Fig. 2. The lug 15′ is provided with an annular groove 15*a* of arcuate cross-section which is complementary to the groove 13*d*, and the middle portions thereof lie in the same plane.

Slidably mounted upon the member 11 and adapted for adjustment at various positions thereon is a rider 16. This rider, as shown, is in the form of a block having a rectangular opening 16*a* through which the member 11 passes, the lower wall of said opening being traversed at its middle point by a pin 16*b*. The lower end of the block is curved, as indicated at 16*c*, and the top of said block is provided with a central screw-threaded opening in which is threaded a thumbscrew 16*d* having a knurled head 16*e*. For setting the rider at predetermined points along the member 11 the latter is provided at its edge adjacent to the member 10 with spaced recesses or detents 11*b* in which the pin 16*c* is adapted to engage, and when in such engagement can be locked upon the member 11 by turning the thumbscrew 16*d* into engagement with the opposite edge of the member 11. For facilitating such setting of the rider upon the member 11, the latter has alphabetical indicia above each of the detents 11*b*, and the rider is provided with a sight opening 16*f* through which said indicia are visible. It will be apparent that at different settings of the rider along the member 11 the inner end 16*c* thereof will engage the edge 10*b* of the member 10 at different points in its length and thus limit to varying degrees the extent to which said arms 10 and 11 may be brought together.

As hereinbefore stated, the slide block 13 is adjustable longitudinally along the member 10, and for indicating such adjustment the member 10 is provided with numerical indicia 10*c* along one edge thereof for cooperation with the lower edge of the slide block. It will thus be apparent that the rounded shoulder 13*d* is adjustable with respect to the lug 15′ to vary the distance therebetween, which distance, as will be presently understood, determines the length of the offset to be made in a valve stem between the two bends thereof.

The tool is primarily intended for imparting a second bend into a valve stem which already has one bend therein and preferably a right-angle bend, and in use its operation is as follows: Assuming it is desired to impart in an angular valve stem 17 fitted to an inner tube 18 by the usual clamping means, a second bend which forms a definite angle with either the offset portion 17*a* or the straight tube-engaging portion 17*b*. The slide block 13 and the rider 16 are set to definite points on their respective carrying members as provided for in a table which would govern the formation of bends for the particular character of valve stem being operated upon. The inflating end of the stem 17*c* is then inserted into the opening 13*b* in the slide block and the lug 15′ brought around into engagement with the bight 17*d* of the right-angle bend in the stem. The members 10 and 11 are then moved together, in the course of which pressure will be applied through the lug 15′ upon the stem 17 to bend the same around the surface 13*d*, and said bending operation is continued until the end 16*c* of the rider contacts with the edge 10*b* of the member 10, as illustrated in dot and dash lines in Fig. 1. The complemental grooves 13*d* and 15*a* will initially guide and maintain the various portions of the valve stem in the same plane during the bending operation.

It will be appreciated that by varying either adjustment of the slide block or of the rider for a given valve stem the angle to be bent will be changed. Said angle will also be different if the initial bend in the valve stem is other than a right-angle. Accordingly, in the operation of the present tool recourse will have to be had to a chart designating the proper settings for the slide block and the rider for obtaining a second bend in the valve stem which has a definite offset and angle.

While I have shown and described a preferred embodiment of my invention I do not wish to be limited to the details of construction herein disclosed as it will be understood that the same may be modified without departing from the spirit of the invention.

What I claim is:

1. A tire valve bending tool comprising a pair of pivotally connected arms, a slide-block longitudinally adjustable on one of said arms, said slide-block having a socket for receiving the inflating end of a valve stem and a curved surface over which said valve stem can be bent, and means on the other of said arms for engaging the valve stem to bend it over said curved surface as the pivoted arms are moved relatively to each other.

2. A tire valve bending tool comprising a pair of pivotally connected arms, a slide-block on one of said arms having a socket for receiving the inflating end of a valve stem and a curved surface over which said valve stem can be bent, and the other of said arms having a lug for engaging the valve stem at a point above the curved surface on the slide-block for bending said valve stem over said curved surface as the pivoted arms are moved relatively to each other, said slide-block being longitudinally adjustable on the first arm to vary the distance between the curved surface on the slide-block and the lug.

3. A bending tool for valve stems already provided with a bend in proximity to the tube engaging end thereof, comprising a pair of pivotally connected arms, one of said arms having a lug engageable in the bight of the bend, the other of said arms having means for engaging the stem on the same side as the bight in longitudinally spaced relation to said bight, and means for engaging the diametrically opposite side of the stem intermediate the lug and the other engaging means, said second named engaging means serving as a shoulder around which the stem can be bent when the pivoted arms are moved toward each other, said last named means being adjustable to vary the distance from the bight in the valve stem at which the second bend therein is to be made.

4. A bending tool for valve stems already provided with a bend in proximity to the tube-engaging end thereof, comprising a pair of pivotally connected arms, one of said arms having a lug engageable in the bight of the bend, the other of said arms having a slidable, adjustable block thereon, said block having a longitudinally extending opening therein for receiving the inflating end of the valve stem and a curved shoulder for engaging the side of the valve stem opposite to that engageable by the lug, said shoulder serving as a point around which the stem can be bent when the pivoted arms are moved toward each other, and indicia on said arm for setting the adjustable block thereon.

5. A bending tool for valve stems already provided with a bend in proximity to the tube-engaging end thereof, comprising a pair of pivotally connected arms, one of said arms having a lug engageable in the bight of the bend, the other of said arms having a slidable, adjustable block thereon, said block having a longitudinally extending opening therein for receiving the inflating end of the valve stem and a curved shoulder for engaging the side of the valve stem opposite to that engageable by the lug, said shoulder serving as a point around which the stem can be bent when the pivoted arms are moved toward each other, indicia for setting the adjustable block on its supporting arm, adjustable means for varying the extent of movement of the arms toward each other, and indicia for setting said adjustable means.

6. A bending tool for imparting a second bend in a tire valve stem already having a substantially right-angle bend therein in proximity to the tube-engaging end thereof, comprising a pair of pivotally connected arms, one of said arms having means adjustable longitudinally thereof for governing the offset distance from the first bend at which the second bend is to be made, and the other arm having adjustable means for cooperative engagement with the first arm for controlling the angle to be formed at said second bend.

In witness whereof, I have hereunto signed my name.

GERRY A. MORGAN.