Sept. 27, 1932. C. BREER 1,879,869

BENDING TOOL

Filed May 21, 1930

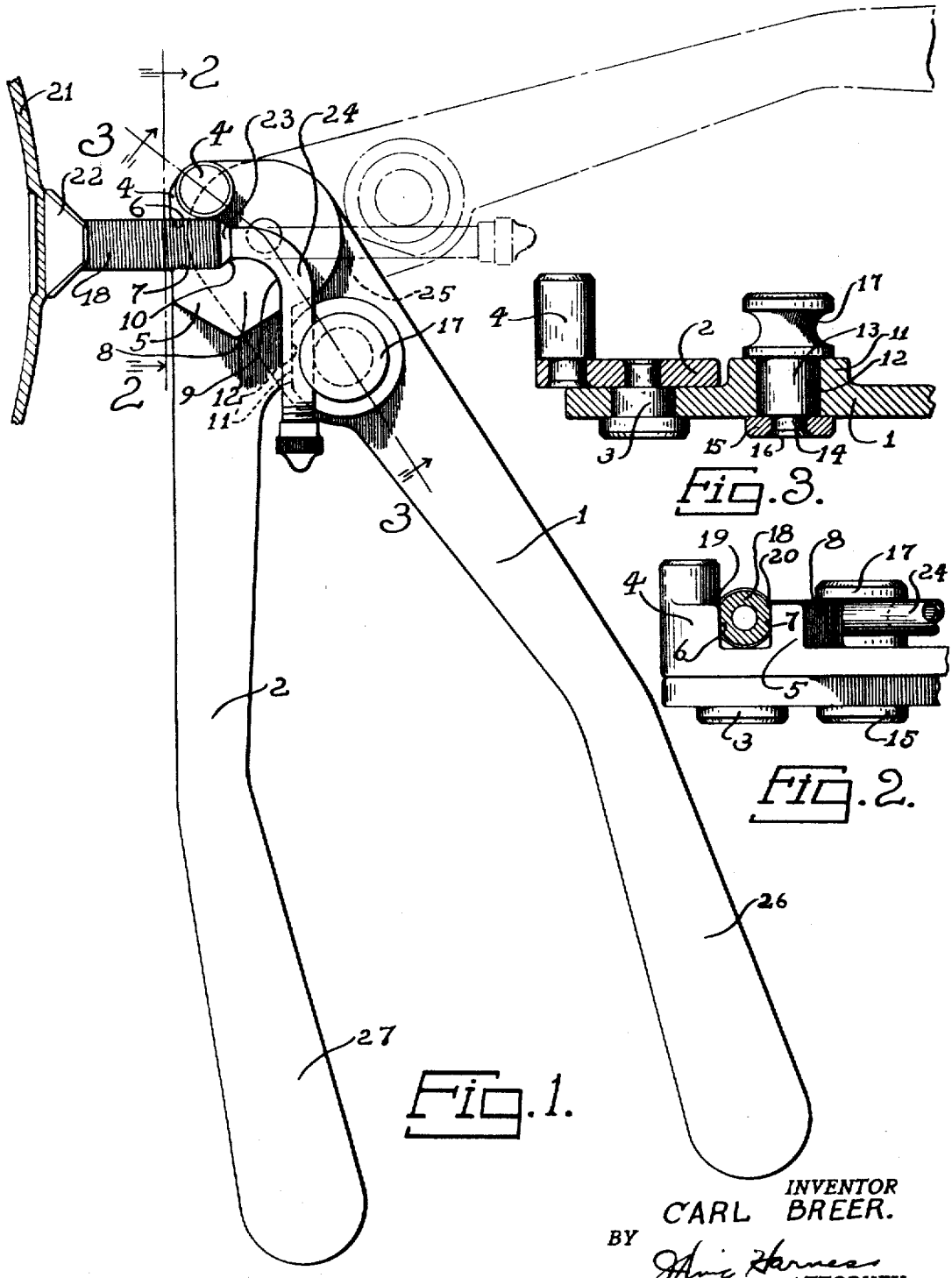

Fig. 1.

Fig. 3.

Fig. 2.

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BENDING TOOL

Application filed May 21, 1930. Serial No. 454,458.

This invention relates to an improved tire valve bending tool of the type shown in my co-pending application, Serial #399,220, filed October 12, 1929.

Vehicle wheels of various types, such as spoke, wire and disc wheels, each require valve stems of different shapes in order that they may conveniently be accessible for inflating the tire. As these valves are generally installed in the inner tubes at the citus of the manufacturer, it is advantageous for dealers to stock only tubes having substantially straight valve stems and then bend the stems to conform with the requirements of the wheels for which the tubes are purchased.

The stem of a tire valve of conventional construction has a threaded shank having substantially diametrically opposite flat side faces which hold the valve against rotation relative to the external clamping member that secures it to the inner tube and which is normally located so that its longitudinal axis lies substantially on a cord of the inner circumference of the tube when inflated. The comparatively fixed relation between the valve clamping member which has a definite position in the tire assembly and the valve stem, requires the latter to be bent in one of the two diametrically opposite directions so as to bring the stem into registration with an aperture in a wheel felloe or disc without twisting or otherwise distorting the inner tube.

The main objects of this invention are to provide a tool which is adapted to bend one end portion of a valve stem in a predetermined direction with respect to the other end portion of the stem and with respect to a clamping member thereon; to provide means on a bending tool of this kind for properly locating the valve stem with respect to the tool so as to form the bend at a predetermined intermediate portion of the stem and for securing a valve stem against both axial movement and rotation during the bending operation; and to provide a pair of jaws on a bending tool between which a valve stem of conventional construction can be inserted only when the flat side faces of the threaded shank of the stem are in registration with the adjacent faces of the jaws.

An illustrative embodiment of this invention is shown in the accompanying drawing, in which:

Fig. 1 is a plan view of a valve stem bending tool illustrating a bending operation.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 is a section taken on line 3—3 of Fig. 1.

In the form shown, the tool includes a pair of arms 1 and 2 which are pivotally connected together at their forward extremities by a rivet 3. Formed on the arm 2 is a pair of spaced jaws or lugs 4 and 5 having adjacent flat side faces 6 and 7 respectively which are substantially parallel to each other.

The lower lug 5, shown in Fig. 1, has an enlarged end extremity 8 on which is formed a rounded or arcuate side face 9. A shoulder 10 is provided at the junction of the flat side face 7 and the arcuate side face 9.

The arm 1 has a boss 11 on one side having an aperture 12 extending therethrough and through the arm 1. Journaled in the aperture 12 is a roller 13 having a reduced lower end portion 14 extending beyond the arm 1, on which a washer 15 is mounted. The outer extremity of the reduced portion 14 is peened over in the countersunk end 16 of the aperture in the washer. The upper end of the roller is provided with a peripheral groove 17. The boss 11 has a flat side 11′ which registers with a substantially straight edge portion 12′ on the arm 2 so as to limit the pivotal movement of the arms 1 and 2 towards each other.

The above tool is particularly adapted for bending valve stems of conventional construction which have a threaded shank portion 18 on the diametrically opposite sides of which are formed flat, substantially parallel side faces 19 and 20. Valves of this kind are usually secured to an inner tube 21 by a clamping member or plate 22 which is located so that its longitudinal axis lies substantially upon a cord of the inner circumference of the inner tube. The threaded shank portion of the valve stem has a shoulder 23 located at

the junction of the latter and a neck portion 24 which has a somewhat reduced diameter.

In operation, the threaded shank 18 of the valve stem is inserted between the lugs 4 and 5 with the side faces 19 and 20 of the stem adjacent the side faces 6 and 7 respectively, of the jaws, the distance between the side faces 6 and 7 of the jaws being slightly greater than the distance between the side faces 19 and 20 of the stem but less than the true diameter of the stem. With this construction, the valve stem 18 cannot be incorrectly placed between the jaws nor can it be rotated during the bending operation. The shoulder 23 of the valve stem abuts the shoulder 10 on the lug 5 when the valve is located between the lugs 4 and 5, thereby holding the valve stem against axial movement to the right as viewed in Fig. 1.

When the valve is in the position illustrated by dotted lines 25 in Fig. 1, the originally straight neck portion 24 extends in advance of the rounded side face 9 on the enlarged end extremity 8 of the lug 5. The neck 24 is received in the groove 17 of the roller 13 as the arms 1 and 2 are manually swung together by manipulation of their handle ends 26 and 27 of the arms. As the handles are moved from an open position towards a closed position, the neck of the valve is bent around the rounded side face 9.

With the above construction, the flat side faces 19 and 20 of the stem are in a fixed relation to the longitudinal axis of the clamping plate 22 and as the threaded shank 18 of the valve stem is received between the lugs 4 and 5 only when the corresponding flat sides of the shank and lugs are in registration with each other, the stem is always located on the tool in a position in which the neck portion 24 of the stem will be bent at right angles to the longitudinal axis of the plate 22 on either one side or the other side thereof. As the plate 22 is positioned so that its longitudinal axis lies on a cord of the inner circumference of the tube, the bending operation forms the neck 24 so that it extends outwardly, substantially normal to a radius of the inner periphery of the tube.

Although but one specific embodiment of this invention has herein been shown and described, it will be understood that various changes including the size, shape and arrangement of parts may be made without departing from the spirit of my invention, and it is not my intention to limit its scope other than by the terms of the appended claims.

I claim:

1. In a portable tool for bending valve stems, a plier-like member including a pair of pivotally connected arms, a pair of spaced jaws on one of said arms having adjacent substantially parallel flat side faces for holding one end of a valve stem, and a lug on the other member for bending said piece of work upon an extremity of one of said jaws.

2. A valve stem bending tool including a pair of pivotally connected members, a pair of spaced jaws on one of said members having extremities located substantially in alignment with an outermost edge of said member and having registering adjacent faces, and a lug on the other member for bending a piece of work around an extremity of one of said jaws.

3. In a portable tool for bending valve stems, a plier-like member including a pair of pivotally connected arms, a pair of jaws on one of said arms having registering adjacent faces, the face of one of said jaws being rounded at its extremity, and a lug on the other arm for bending said valve stem upon said rounded face extremity.

4. In a portable tool for bending a tire tube valve stem having flat opposite side faces, a plier-like member including a pair of pivotally connected arms, a pair of spaced jaws on one of said members having registering adjacent side faces for receiving the side faces of said stem, the extremities of said jaws being located substantially in alignment with the extremity of the outermost portion of said member so as to permit bending of a valve stem while the latter is fixed on a tire tube and means on the other member for engaging an end portion of said stem so as to bend the intermediate portion thereof upon an extremity of one of said jaws during relative rotation of said members.

5. In a tool for bending a tire tube valve stem having flat side faces, a pair of pivotally connected members, a pair of jaws on one member having extremities at the forward edge thereof and each having a substantially flat face, the side faces of said jaws being spaced relative to each other sufficiently to permit insertion of said valve stem therebetween only when the side faces of the latter are adjacent the side faces of said jaws, and a lug on the other member engageable with one end of said valve stem for bending the latter upon relative rotation of said members.

6. In a tool for bending a tire tube valve stem having diametrically opposite flat side faces, a pair of pivotally connected members, a pair of spaced jaws on one of said members, adjacent registering side faces on said jaws, the side faces of said jaws being spaced apart sufficiently to permit insertion of said valve stem between said jaws only when the side faces of said stem are in registration, respectively, with the side faces of said jaws, and a roller journaled on the other member having a peripheral groove for receiving one end of said valve stem so as to bend the latter upon relative rotation of said members.

7. In a tool for bending a tire tube valve stem having flat side faces, a pair of pivotally connected members, a pair of jaws on

one of said members extending inwardly from the outermost edge thereof and having registering flat side faces for receiving the side faces of said valve stem, means on an extremity of one of said jaws having a rounded side face, and means on the other member for bending said valve stem upon said rounded side face.

8. In a tool for bending a tire tube valve stem having flat side faces and a shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, an enlarged end portion on one of said lugs having a shoulder for abutting the shoulder of said stem so as to hold the latter against axial movement in one direction, and means on the other arm for bending said stem upon said enlarged end portion.

9. In a tool for bending a tire tube valve stem having flat side faces and a shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, an enlarged end portion on one of said lugs having a shoulder for abutting the shoulder of said stem so as to hold the latter against axial movement in one direction and having a rounded outer extremity, and means on the other arm for bending said stem upon the rounded extremity of said enlarged end portion.

10. In a tool for bending a tire tube valve stem having flat side faces and an inclined shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, one lug having a flat side and a spaced enlarged end portion and an intermediate inclined shoulder for abutting the inclined shoulder of said valve stem in parallel relationship, and means on the other arm for bending said stem upon said enlarged end portion.

CARL BREER.

CERTIFICATE OF CORRECTION.

Patent No. 1,879,869. September 27, 1932.

CARL BREER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 66, claim 1, for "piece of work" read "valve stem"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of February, A. D. 1933.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)

one of said members extending inwardly from the outermost edge thereof and having registering flat side faces for receiving the side faces of said valve stem, means on an extremity of one of said jaws having a rounded side face, and means on the other member for bending said valve stem upon said rounded side face.

8. In a tool for bending a tire tube valve stem having flat side faces and a shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, an enlarged end portion on one of said lugs having a shoulder for abutting the shoulder of said stem so as to hold the latter against axial movement in one direction, and means on the other arm for bending said stem upon said enlarged end portion.

9. In a tool for bending a tire tube valve stem having flat side faces and a shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, an enlarged end portion on one of said lugs having a shoulder for abutting the shoulder of said stem so as to hold the latter against axial movement in one direction and having a rounded outer extremity, and means on the other arm for bending said stem upon the rounded extremity of said enlarged end portion.

10. In a tool for bending a tire tube valve stem having flat side faces and an inclined shoulder at the extremities thereof, a pair of pivotally connected arms, a pair of lugs on one of said arms having substantially flat side faces for receiving the side faces of said valve stem, one lug having a flat side and a spaced enlarged end portion and an intermediate inclined shoulder for abutting the inclined shoulder of said valve stem in parallel relationship, and means on the other arm for bending said stem upon said enlarged end portion.

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