Jan. 24, 1961 W. ZIEROLD 2,968,980

WRENCH WITH A VERTICALLY ADJUSTABLE CROSSARM

Filed March 3, 1959

FIG. 9

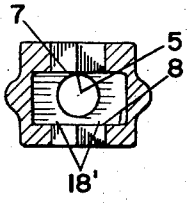


FIG. 6

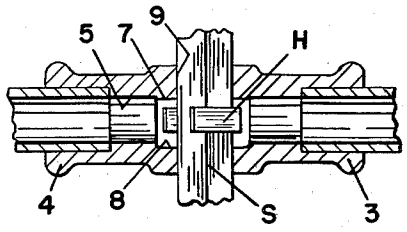


FIG. 1

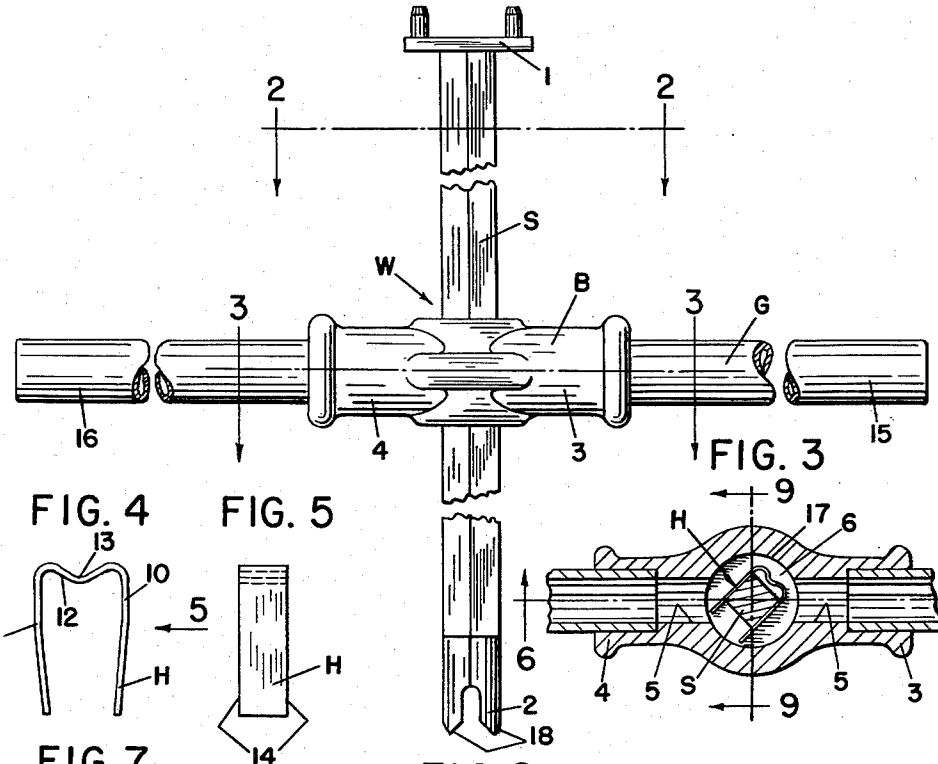


FIG. 3

FIG. 4

FIG. 5

FIG. 7

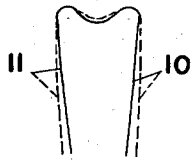


FIG. 2

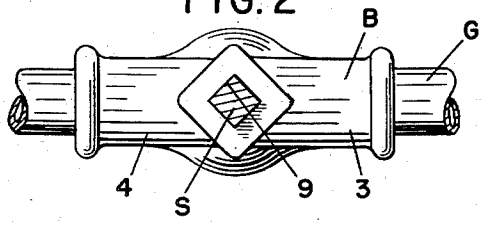
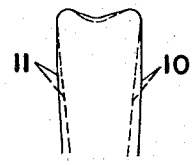


FIG. 8



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United States Patent Office 2,968,980
Patented Jan. 24, 1961

2,968,980

WRENCH WITH A VERTICALLY ADJUSTABLE CROSSARM

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Filed Mar. 3, 1959, Ser. No. 796,845

6 Claims. (Cl. 81—177)

This invention relates to wrenches of the type adapted more particularly for use with underground valves such as are used, for instance, on water and gas pipes.

Valves of the type mentioned are likely to be located at different distances below the street surface and it is the general object of the invention to provide a wrench which can be adjusted readily to valves at varying depths below the street level.

It is a further object of the invention to provide a simple adjusting means for holding the wrench at different distances along the shank of the wrench to adapt the latter for use with cutoff valves located at different distances below the surface.

It is a further object of the invention to provide a wrench assembly including a handle formed with a pocket or chamber to receive a friction holding means, such as a spring, to grip a wrench shank passing through the handle. The holding means normally holds the handle and shank in fixed position but can yield to permit the handle to slide along the shank. The shank is preferably an elongated bar of noncircular cross section and may have a valve grip at each end thereof, the wrench being invertible and the holding means serving to maintain the handle and shank in operative relation whichever end of the shank is being used.

The holding means is preferably a U-shaped spring made of flat stock and made with two more or less parallel arms to grip the shank with sufficient force to support the handle, when the shank is upright. The two arms are joined by a curved part of the spring which permits adjustment of the distance between the arms to adapt the holding means to proper holding relation with respect to the shank.

It is still a further object of the invention to provide a wrench handle having a central body or pocket member formed with the aforesaid chamber and having hollow handle holds, such as pipe, of sufficient inside diameter to allow insertion of the holding means through a hand hold into the chamber.

In the accompanying drawing, which shows a convenient embodiment of the invention,

Fig. 1 is a side elevation of the wrench forming the subject matter of the invention, parts being broken away,

Fig. 2 and 3 are horizontal sections on lines 2—2 and 3—3 respectively, Fig. 1,

Fig. 4 is an enlarged plan view of the spring holding means or member shown in Fig. 3,

Fig. 5 is a side elevation of the holding member looking in the direction of arrow 5, Fig. 4,

Fig. 6 is a vertical section on line 6—6, Fig. 3,

Fig. 7 is a diagrammatic view of the spring holding member showing how it can be altered to increase the distance between the holding arms,

Fig. 8 is a view similar to Fig. 7 but showing how the distance between the arms can be reduced, and

Fig. 9 is a vertical section on line 9—9, Fig. 3, with the shank removed.

Referring to the drawing, the wrench, designated generally at W, includes a shank S, a body or pocket member B, hollow handholds or grips G, and a spring holding member H.

The shank S is elongated and of noncircular cross-section shown here as square, and has a valve turning wrench means at each end thereof, the upper means 1 being of one form to fit one type of valve and the lower means 2 being of a different form to fit another type of valve. The means 1 and 2 are preferably welded to their respective ends of the shank after the parts have been assembled, as will be described. One, or both, of these means can, however, be made detachable if desired and attached to the shank by any convenient attaching means. The shank is preferably of uniform cross-section throughout its length and can be a steel rod.

The body or socket member B is preferably made as a metal casting, as of cast iron, and has right and left-hand hollow ends 3 and 4, respectively, formed with bores 5 which communicate with a central chamber 6 which, as shown in Fig. 6, is formed with flat preferably parallel top and bottom surfaces 7 and 8 respectively, which are at right angles with the shank S. Extending vertically through the body B and through the chamber 6 is a hole 9 formed to have a sliding fit with the shank. The hole is in effect in upper and lower aligned parts and has a cross-section of similar form, though slightly larger, to that of the shank. The chamber 6 is of cylindrical form on its sides, see Fig. 3, except where it communicates with the bores 5.

The holder member H is made from flat sheet steel stock bent to the form shown in Fig. 4. It has right and left-hand arms 10 and 11 respectively, joined by a cross-connecting part 12 having a rounded in-bent central position 13. If it is desired to increase the distance between the arms 10 and 11 the bent portion 13 can be struck with an appropriate tool to the dotted line position shown in Fig. 7, resulting in a spreading of the arms as shown in dotted lines. If, on the other hand, it is desired to reduce the distance between the arms holder H can be laid with one of its arms on a hard surface and the other arm struck with a hammer which will increase the amount of the in-bend 13 and draw the arms toward each other as shown in dotted lines, Fig. 8. The reason for these adjustments of the arms is to enable them to lie flat along opposite sides of the shank and establish a firm grip on it. The member H is tempered and normally of the form shown in Fig. 4, but when in use the arms spread somewhat to the form shown in Fig. 3. The width of the spring member is slightly less than the distance between the top and bottom surfaces 7 and 8 of the chamber 6 and the edges of the arms are preferably parallel to each other and to the surfaces 7 and 8 when assembled for use.

The handholds or grips G comprise hollow elements 15 and 16 at the right and left of the body member B and in effect are pipes which fit into the bores 5 and are permanently secured to their corresponding ends 3 and 4 of the member B, as by welding, soldering, or in any other approved manner. At least one of the pipes 15—16 will have an internal bore sufficiently large to enable the spring holding member H to be slid from one end thereof through the pipe and into the chamber 6.

In assembling the parts of the wrench the holding member will be inserted into the outer end of one of the handholds and the latter is then tipped to cause the member H to slide along the interior of the handhold and into the chamber 6. By referring to Fig. 9 it will be seen that the cylindrical side wall of chamber 6, identified at 17 in Figs. 3 and 9, has areas 18' at the sides of the bore 5 which will serve to engage the advancing parts of the holding member H as it drops on surface 8 enter-

ing chamber 6, thus arresting motion of member H in the chamber. To insure this result the diameter of the bores 5 is somewhat less than the distance between surfaces 7 and 8.

After member H is in the chamber 6 it will be centered, approximating parallelism with opposite sides of the lower part of hole 9. An end of the shank having slightly tapered sides, as at 18 in Fig. 1, is then pushed down through the upper part of hole 9 into the chamber 6 and against the arms 10 and 11 to spread them apart to establish the gripping relation shown in Fig. 3. The shank is then pushed further through the lower part of hole 9 and along the holder H to any declared position. The wrench ends, 1 and 2, or other ends of selected form, are then welded to the ends of the shank. In Fig. 1 the tapered sides 18 are shown on wrench end 2, but similar tapers can be formed directly on an end of the shank and thereafter wrench ends not suitable for taper, as end 1, be welded in place.

An important feature of the spring holder grows out of its normal form shown in full lines in Figs. 7 and 8. In the unstressed condition of the spring the arms are relatively bent toward each other so that the distance between those parts of the arms 10 and 11 which are to engage opposite sides of the shank will be less than the distance between said sides. Then as the shank spreads the arms they will lie along the aforesaid opposite sides to establish a firm hold on the shank. The inbent part of the spring yields somewhat to permit this adjustment of the arms to the shank.

In use the wrench may be employed to turn underground valves in water, oil, or gas or similar pipe lines. An end of the shank will be inserted into a hole leading to the valve and the handle, formed of parts B, G, H, slid along the shank to the appropriate position, and the handle will remain in this position due to the grip the spring holding member exerts on the shank. If the wrench needs to be inverted for use with a different type of valve the spring holding member will be equally effective in supporting the handle even though inverted.

It is apparent from Fig. 3 that the diameter of the chamber is considerably less than the width of the shank plus the length of the spring holding member H and that the latter is disposed at an angle, such as 45 degrees, to the common axis of the bores 5, so that even though member H should become loose on the shank it cannot fall out of chamber 6 as long as the shank is in place.

From the foregoing it will be seen that the wrench set forth herein includes an elongated shank having at least one wrench head, 1 and or 2, and of noncircular cross-section, preferably rectangular, to cooperate with the spring holding member which is located in a cavity formed in the body of the handle disposed transversely of the shank. The handle can be slid along the shank but the holding member will be strong enough to support the handle in any position it can assume along the shank. Also, the holding member is strong enough to support the shank from the handle when the shank is being lowered to operating position.

What I claim is:

1. In a wrench, an elongated shank of non-circular cross-section having a wrench head on at least one end thereof, a handle transverse of the shank including a body having therein a hole with a cross-section approximately that of said shank and through which the latter passes, said body having a cavity therein merging with the hole and through which the shank passes, and a resilient holding member comprising a spring confined within the cavity formed with integral arms having frictional holding relation with opposite sides of the shank enabling the shank and handle to have relative motion lengthwise of the shank but normally effective by engagement with part of said body to prevent relative motion of the shank and handle due solely to their weight, said spring being made of flat stock and said arms being joined by a cross piece having a bend therein the curvature of which can be reduced to spread the arms apart or increased to lessen the distance between the arms.

2. In a wrench, an elongated shank of non-circular cross-section having a wrench head on at least one end thereof, a handle transverse of the shank including a body having therein a hole with a cross-section approximately that of said shank and through which the latter passes, said body having a cavity therein merging with the hole and through which the shank passes, and a resilient holding member comprising a spring confined within the cavity formed with integral arms having frictional holding relation with opposite sides of the shank enabling the shank and handle to have relative motion lengthwise of the shank but normally effective by engagement with part of said body to prevent relative motion of the shank and handle due solely to their weight, said handle having a bore therein communicating with said cavity and the spring being slidable through the bore into the cavity.

3. The wrench set forth in claim 2 wherein the cavity has a lower surface below the bore onto which the spring drops and along which it can slide into engagement with a wall of the cavity and be prevented by said wall from sliding out of the cavity.

4. The wrench set forth in claim 3 wherein the distance between the shank and the wall of the cavity is less than the length of the arms to prevent the latter from slipping off the shank.

5. In a wrench, an elongated shank of non-circular cross-section having a wrench head on at least one end thereof, a handle transverse of the shank including a body having therein a hole with a cross-section approximately that of said shank and through which the latter passes, said body having a cavity therein merging with the hole and through which the shank passes, and a resilient holding member comprising a spring confined within the cavity formed with integral arms having frictional holding relation with opposite sides of the shank enabling the shank and handle to have relative motion lengthwise of the shank but normally effective by engagement with part of said body to prevent relative motion of the shank and handle due solely to their weight, said spring when in the normal condition thereof having the arms thereof bent relatively toward each other to be closer to each other than the distance between the sides of the shank they are to engage.

6. The wrench set forth in claim 5 wherein the spring is U-shaped and the arms are joined by an inbent part of the spring which yields when the arms are spread apart incident to gripping the shank.

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