Feb. 7, 1928.

1,658,075

H. G. BUTT

PIPE WRENCH

Filed Feb. 26, 1927

Fig. 1.

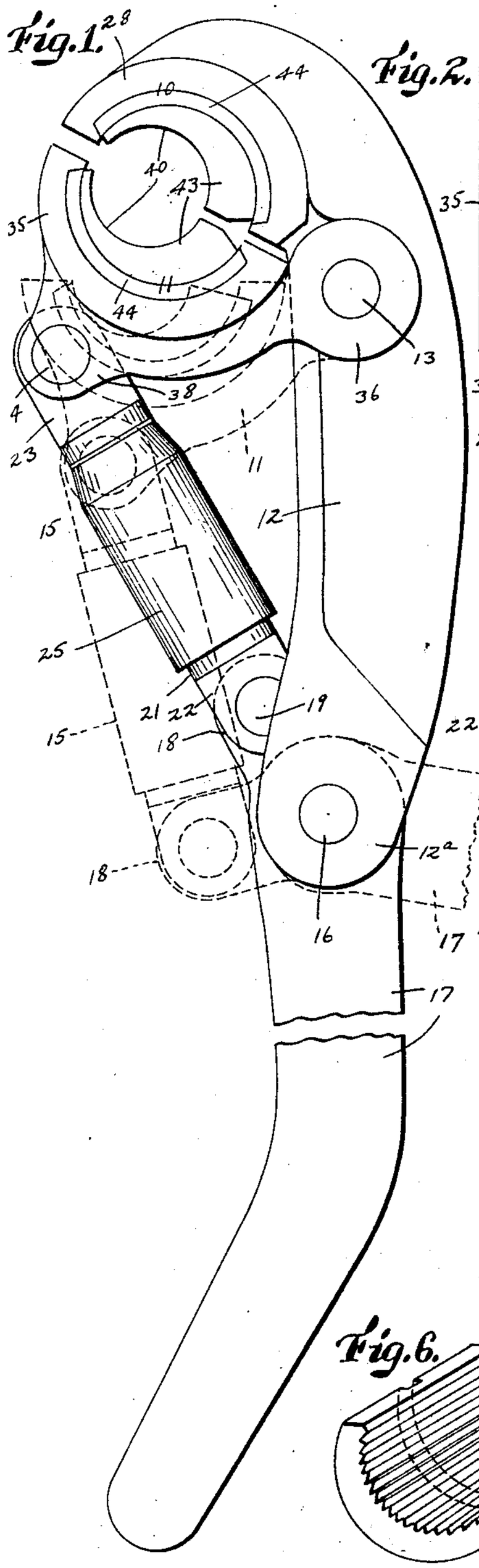


Fig. 2.

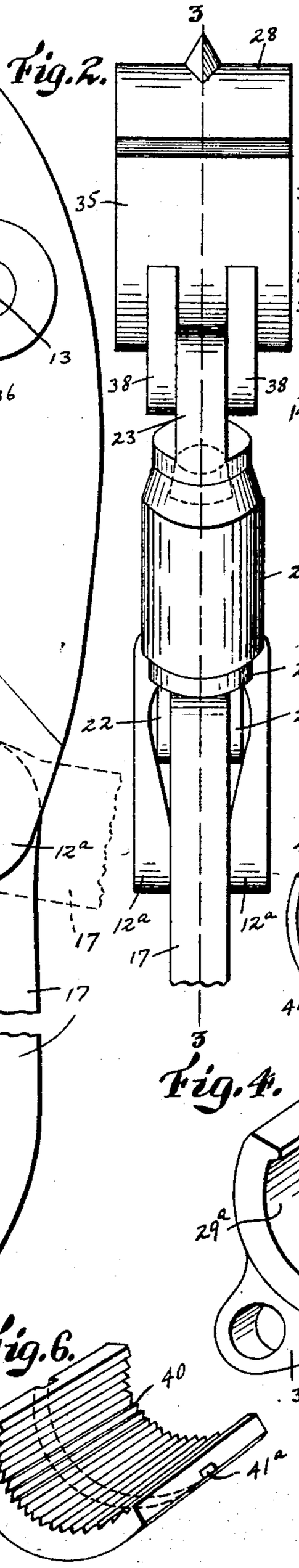


Fig. 3.

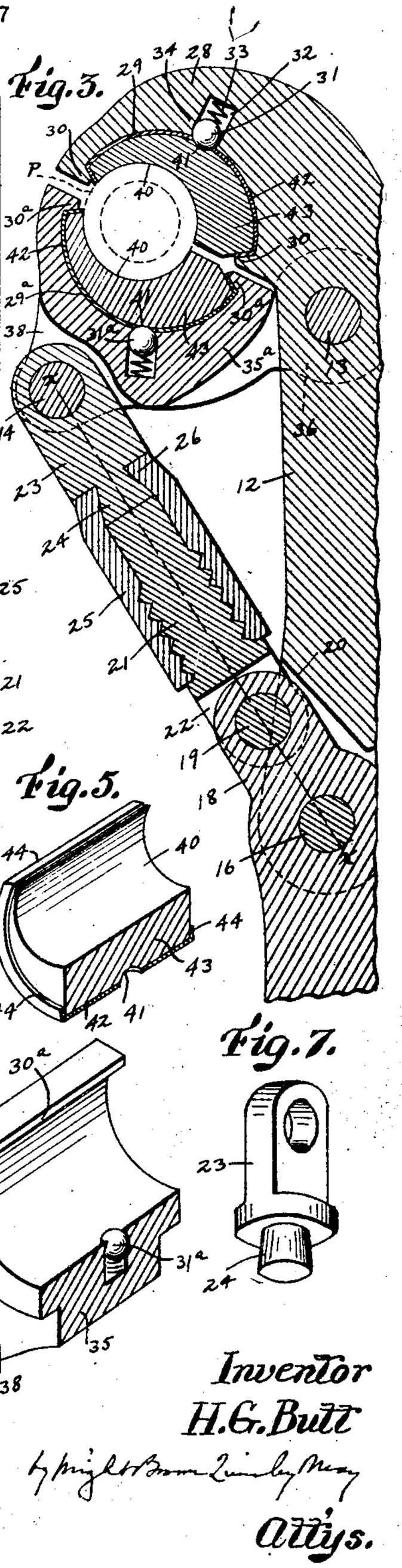


Fig. 5.

Fig. 7.

Fig. 4.

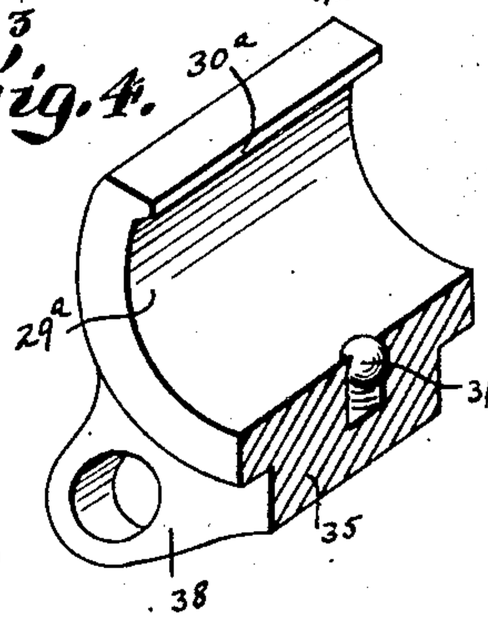
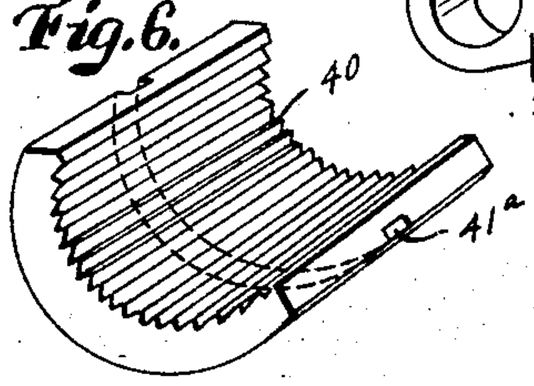


Fig. 6.



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UNITED STATES PATENT OFFICE.

HERBERT G. BUTT, OF WINTHROP, MASSACHUSETTS.

PIPE WRENCH.

Application filed February 26, 1927. Serial No. 171,110.

This application is a continuation in part of my application filed September 16, 1925, Serial No. 56,629.

One object of the invention is to provide a pipe wrench including opposed jaws, one relatively fixed, and the other relatively movable, the jaws being adapted to grasp and turn a cylindrical body, such as a pipe length, and manually operable mechanism adapted to close the movable jaw on a pipe supported by the fixed jaw, and to automatically lock the movable jaw in its closed position, so that the operator is not required to manually hold the movable jaw in said position, said mechanism including a turnbuckle element which is adjustable, to enable the jaws to grip pipes of different diameters and permit the locking of the movable jaw, when it is closed on a pipe of any diameter which the wrench is capable of engaging.

Another object is to provide a turnbuckle of improved construction, constituting an element of said mechanism.

Another object is to provide an improved construction of the jaws, whereby different gripping faces may be used interchangeably, and quickly and conveniently interchanged.

Other objects will hereinafter appear.

Of the accompanying drawings forming a part of this specification—

Figure 1 is a side view of a pipe wrench embodying the invention.

Figure 2 is an edge view of the same, a portion of the operating lever being broken away.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a perspective sectional view, showing a part of the body member of the inner jaw, and a detent associated therewith.

Figure 5 is a perspective sectional view, showing a part of the facing member of the inner jaw, and the detent-receiving recess therein.

Figure 6 is a perspective view of a differently constructed facing member, adapted to be used with the body member shown by Figure 4.

Figure 7 is a perspective view, showing the outer member of the turnbuckle shown by Figures 1, 2 and 3.

The same reference characters indicate the same parts in all of the figures.

A pipe wrench embodying the invention includes an outer jaw designated as a whole by 10, (Figure 1), having a gripping face conforming to one side of a pipe length, an elongated shank 12 supporting the outer jaw, the gripping face overhanging one side of the shank, an inner jaw, designated as a whole by 11 (Figure 1), having a gripping face opposed to the gripping face of the outer jaw and conforming to the opposite side of the pipe, the inner jaw having a short shank hereinafter described, projecting from the inner end of the gripping face and connected by a pivot stud 13 with the shank 12 of the outer jaw, and a toggle ear hereinafter described, spaced outwardly from the short shank of the inner jaw and connected by a pivot stud 14 with one end of the turnbuckle, designated as a whole by 15 (Figure 1), constituting an element of the manually operable mechanism, whereby the inner jaw is closed on a pipe P (Figure 3) supported by the outer jaw.

The inner jaw is adapted to swing toward and from the outer jaw, to cause the faces of said jaws to grip the interposed pipe. The above mentioned operating mechanism includes also a two-armed operating lever connected by a fulcrum stud 16, with one end of the longer shank 12, said end being bifurcated to form two ears 12ª. The lever includes a longer arm 17, constituting a handle, and a shorter arm 18, constituting a toggle member, and connected by a toggle stud 19 with the turnbuckle member 15.

The length of the turnbuckle member is variable, to permit the gripping faces of the jaws to grip pipes of different diameters, and the arrangement is such that when the turnbuckle is adjusted to adapt the jaw faces to a pipe of given diameter, and the said faces are caused to grip the pipe, the axes of the fulcrum stud 16, and of the two toggle studs 14 and 19, are in substantially a common plane, indicated by the line x, x (Figure 3), so that the toggle formed by the shorter arm 18 and the turnbuckle 15 is locked and maintains the jaws in gripping engagement with the pipe without effort on the part of the operator.

The shank 12 supporting the outer jaw, is provided with a stop 20 (Figure 3) arranged to cooperate with the shorter lever arm 18 in limiting the movement of said arm to its jaw-closing position, and maintaining the locking of the jaws by preventing movement of the toggle stud 19 to the right from the position shown by Figure 3. In other words, the stop 20 prevents the stud 19 from

being moved out of alinement with the studs 14 and 16 by a continuation of the inner-jaw-closing movement of the lever. This is true when the turnbuckle is at any length to which it is capable of being adjusted.

The turnbuckle element is preferably constructed as shown by Figure 3, and is composed of an externally threaded inner member 21, having ears 22, engaged with the toggle stud 19, an outer member 23, engaged with the toggle stud 14, and provided with a fixed tapered swivel stud 24, and an internally threaded intermediate tubular member 25, engaged with the external thread of the inner member 21, and having a contracted end portion forming a tapering socket 26 (Figure 3), interengaged with and adapted to turn on the stud 24, so that the intermediate member has an inseparable swivel connection with the outer member. When the intermediate member 25 is rotated, the turnbuckle is lengthened, or shortened, as the case may be. The turnbuckle is of extremely simple, strong and durable construction, and has only one external and one internal screw thread. These may be relatively coarse as indicated by Figure 3, and therefore stronger and more durable than finer threads.

I will now describe the preferred construction of the outer and inner jaws. The outer jaw includes a body portion 28, integral with the shank 12, and provided with a reentrant seat 29, preferably substantially semi-circular, guiding ribs 30, at opposite edges of the seat, and a spring-pressed detent yieldingly projecting from the seat between the guiding ribs, the detent being preferably a ball 31, inserted in a socket 32, formed in the body portion 28, and backed by a spring 33. The mouth of the socket is slightly contracted at 34, after the insertion of the spring and ball, so that the ball cannot leave the socket.

The inner jaw includes a body portion 35, on the inner end of which are formed ears 36 (Figures 1 and 3) bearing on opposite sides of the upper jaw shank 12, and engaged with the pivot stud 13. One of said ears is shown by full lines in Figure 1, and the other by dotted lines in Figure 3. Said ears collectively constitute the above-mentioned short inner shank of the inner jaw. The body portion 35 of the inner jaw is provided with toggle ears 38, bearing on opposite sides of the turnbuckle member 23, and engaged with the pivot stud 14. The body portion 35 is provided also with a reentrant seat 29^a, guiding ribs 30^a, and a spring-pressed detent 31^a, corresponding to the seat 29, ribs 30, and detent 31, of the body portion of the upper jaw. Each jaw includes a facing member, having a salient back fitting the reentrant seat, a reentrant gripping face 40, conforming to a side portion of a cylindrical pipe, longitudinal edge faces slidable between and guided by the guiding ribs 30, and a recess 41, in the salient face, arranged to receive the projecting portion of the detent 31, when the facing member is in its operative position, the detent being displaceable by an endwise movement of the facing member, so that each facing member may be pushed to place, engaged by the detent, and pushed out of place and removed from the body portion.

Differently constructed facing members adapted to be used interchangeably are shown by the drawings. Each facing member shown by Figures 1, 3 and 5, includes a sheet metal shell 42, constituting the salient back, and containing the recess 41, and an inner portion 43 of non-abrasive material on which the gripping face 40 is formed, the nature of said material being such that it is not liable to mar polished surfaces. The shell is provided with flanges 44, overlapping the longitudinal edges and the ends of the inner portion 43. Said inner portion may be made of seasoned hard wood, as oak, or other non-metallic material, such as bakelite. It may also be made of brass, or other metallic alloy. Figures 2, 3 and 5 show the gripping faces 40, eccentrically arranged relative to the salient backs of the facing members. The object of this arrangement is to adapt said faces to grasp a pipe which is located in close proximity to a wall, or other obstructing surface. The gripping faces 40 may be concentric with the backs of the inner members 43, if desired.

Figure 6 shows a facing member, the gripping face 40 of which is corrugated, this member being of hard metal. The detent-receiving recess in this instance, provided by cutting a transverse groove 41^a in the salient back of the facing member, the detent engaging the central portion of the groove.

The inner jaw is separable from the outer jaw, as indicated by dotted lines in Figure 1, by swinging the operating lever.

I claim:

1. A pipe wrench comprising an outer jaw having a gripping face and an elongated shank projecting therefrom, said gripping face overhanging the inner side of the shank, an inner jaw having a gripping face opposed to the gripping face of the outer jaw, and having a short inner shank projecting from the inner end of said gripping face, and connected by a pivot stud with the outer jaw shank, and a toggle ear spaced outwardly from said inner shank, the arrangement being such that the inner jaw is adapted to swing on the pivot stud to cause the said faces to grip an interposed pipe, a two-armed lever connected by a fulcrum stud with the end of the outer jaw shank, and including a longer arm constituting a handle,

and a shorter arm constituting a toggle member, and a turnbuckle toggle member connected at its opposite ends by toggle studs with the shorter arm and with the toggle ear of the inner jaw, the length of the turnbuckle member being variable to permit the gripping faces to grip pipes of different diameters, the arrangement being such that when the turnbuckle is adjusted to adapt the jaw faces to a pipe of a given diameter, and said faces are caused to grip the pipe, the axes of the fulcrum stud and of the two toggle studs are substantially in a common plane, so that the toggle formed by the shorter arm and the turnbuckle is locked.

2. A pipe wrench as specified by claim 1, the shank of the outer jaw being provided with a stop arranged to cooperate with the shorter lever arm in limiting the movement of said arm to its jaw-closing position, and maintaining the locking of the toggle.

3. A pipe wrench as specified by claim 1, the turnbuckle being composed of an externally threaded inner member pivoted to the shorter lever arm, an outer member pivoted to the fulcrum ear of the inner jaw and provided with a tapered swivel stud, and an internally threaded rotatable intermediate tubular member, engaged with the external thread of the inner member and having a contracted end portion forming a tapered socket interengaged with and adapted to turn on the swivel stud, so that the intermediate member has an inseparable swivel connection with the outer member.

4. A pipe wrench comprising an outer jaw, an inner jaw movably connected with the outer jaw, and movable toward and from the latter, and manually operable mechanism for moving the inner jaw, each jaw including a body portion having a reentrant seat, guiding ribs at opposite edges of the seat, and a spring-pressed detent yieldingly projecting from the seat between the guiding ribs, and a facing member having a salient back fitting the seat, a reentrant gripping face conforming to a side portion of a cylindrical pipe, longitudinal edge faces slidable between and guided by said ribs, and a recess in the salient face arranged to receive the projecting portion of said detent, when the facing member is in its operative position, the detent being displaceable by an endwise movement of the facing member.

5. A pipe wrench as specified by claim 4, the gripping faces of said facing members being eccentrically arranged relative to the backs thereof, so that said faces are adapted to grasp a pipe in close proximity to an obstructing surface.

6. A pipe wrench as specified by claim 4, each of said facing members including a sheet metal shell constituting the salient back, and an inner portion of non-abrasive material, on which the gripping face is formed, the shell being provided with flanges overlapping the longitudinal edges and the ends of the inner portion.

In testimony whereof I have affixed my signature.

HERBERT G. BUTT.