April 28, 1925. 1,535,534

P. McDONALD ET AL

PIPE WRENCH

Original Filed Feb. 14, 1921

Fig. 1.

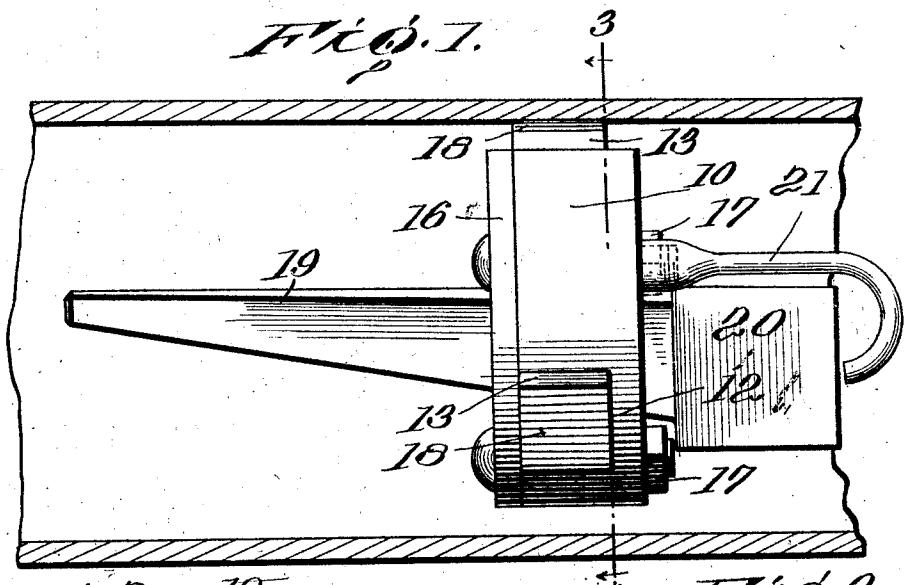


Fig. 2.

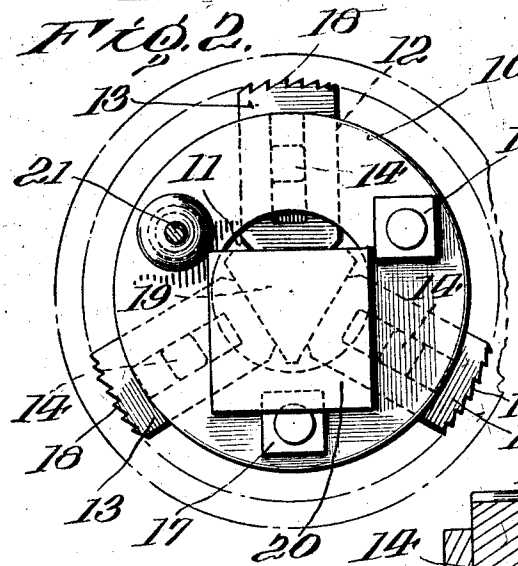


Fig. 3.

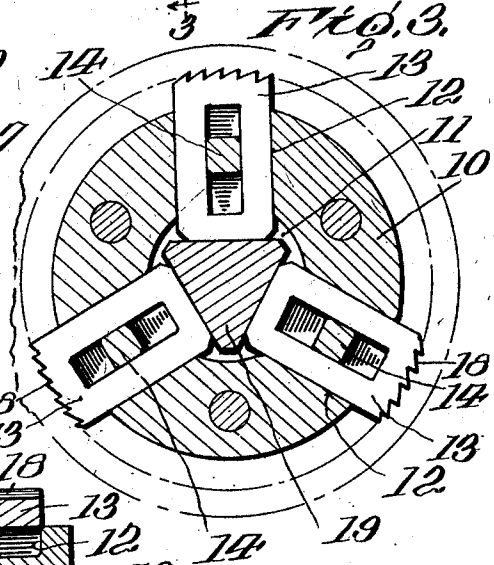
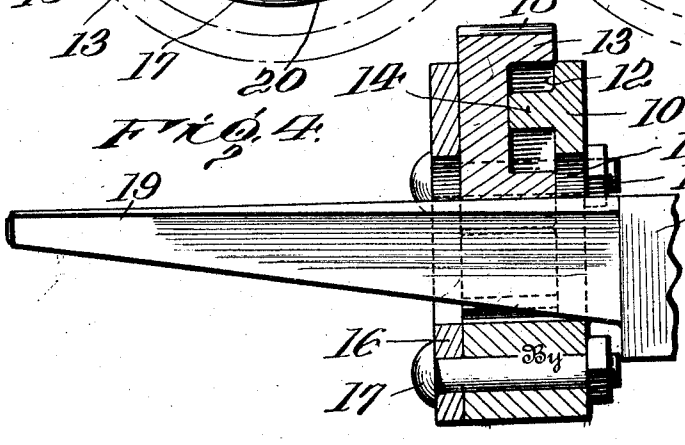


Fig. 4.



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UNITED STATES PATENT OFFICE.

PEARL McDONALD AND EMORY O. CALL, OF MARION, OHIO.

PIPE WRENCH.

Application filed February 14, 1921, Serial No. 444,896. Renewed March 9, 1925.

To all whom it may concern:

Be it known, that we, PEARL McDONALD and EMORY O. CALL, citizens of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented a new and useful Pipe Wrench, of which the following is a specification.

This invention is a device for removing broken parts of pipes, nipples, elbows and the like remaining inside of and in threaded engagement with another pipe.

One of the objects of the invention is to provide a wrench-like device, which may be inserted into that portion of the broken member which remains within the pipe, and having means capable of so engaging said broken member as to turn it when rotated by means of a suitable tool. A further object is to provide a device of the character mentioned, having expansible engaging devices capable of being inserted into pipes of different sizes, and means whereby they may be quickly adjusted and held into biting engagement with the member to be rotated. A further object is to provide a wrench having the characteristics mentioned, which will be capable of removing a broken member without injuring the threads of the pipe from which it is to be removed.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing:—

Figure 1 is a longitudinal sectional view illustrating a wrench constructed according to the invention, in position to remove a broken part. Figure 2 is a front view illustrating the wrench removed. Figure 3 is a transverse sectional view thereof. Figure 4 is a longitudinal sectional view.

Referring to the drawing, 10 designates a cylindrical casing provided with a central chamber or bore 11, and having a plurality of radially disposed channels 12, leading from said central chamber bore to the periphery of the casing. Slidably mounted in the channels 12 are pipe-engaging members 13, one for each channel, said members being free to move radially of the casing 10. Radial movement of the pipe-engaging members 13 may be limited in any desired manner, but it is preferred to provide each channel 12 with upstanding lug 14, which engages a complemental recess in the underside of the pipe-engaging member. Said pipe-engaging members are retained in their channels 12, by means of a removable cover plate 16, secured in position in any suitable manner, such as by the bolts and nuts 17. It will be observed that the outer end of the pipe-engaging members 13 are provided with teeth 18, capable of maintaining a biting engagement with the inner surface of the member which is to be turned.

Outward movement of the pipe-engaging members 13 is effected by means of a suitable expanding device. Said device, as shown, comprises a tapered shank 19 of triangular cross section, the larger end of the shank being provided with an angular head 20. The shape of the cross section of the shank 19, will vary according to the number of pipe-engaging members 13, the shank being provided with one face for each of said members 13.

In operation, when it is desired to remove from a pipe the portion of a broken element retained therein, the casing 10 is inserted within the part to be removed, the pipe engaging members 13 having been pushed in or retracted in any suitable manner. The tapered shank 19 is then forced in suitable manner, into the space formed by the meeting inner ends of the pipe-engaging members 13, and caused to move inwardly, until the taper thereof has projected said members a sufficient distance to bring the toothed ends 18 into engagement with the part which is to be removed. After the expander has forced in to such an extent as to insure a biting engagement between the members 13 and the part to be moved, a suitable wrench or other device is engaged with the head 20, so as to rotate the expander and the casing 10. Owing to the engagement of the angular faces of the shank 19 with the inner ends of the members 13, relative rotation of the expander and the wrench is prevented. Therefore, rotation of the expander imparts a corresponding rotation to the wrench, and in this manner the broken part, which is engaged by the members 13, will be rotated so as to unscrew it, thereby effecting its disengagement from the pipe in which it is held. It is to be understood that the casing 10 is made of such dimensions, and the members 13 are of such length, that the casing may be inserted into pipes of various bores, and that the tapered shank 19 of the expander, will cause the members 13 to be forced outwardly and accurately engaged with the pipe, the size of pipe which may be engaged

by the wrench, being limited solely by the length of the members 13 and their range of movement.

If desired the wrench may be provided with a handle 21 or a similar device, to assist in placing it in position, and to prevent it from being inserted too far into the pipe.

The advantages of the invention will be readily understood by those skilled in the art to which it appertains. It will be particularly noted that a simple and inexpensive wrench is provided, which is capable of being inserted into pipes of different sizes, and caused to so engage the said pipe, that it may be readily rotated to effect disengagement from a complemental element without in any manner injuring the threads of the element from which the broken part is removed.

A further advantage of the invention is that by means thereof a close or short nipple may be screwed in place without injuring the external threads thereof. The common practice of turning such nipples into place by means of a wrench which grips the exterior thereof, often damages the threads to such an extent that it is impossible to secure a joint which will not leak. The internal engagement of the nipple by a wrench of the character above described insures undamaged threads and a tight joint.

Having thus explained the nature of the invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what is claimed is:—

1. A wrench of the character described comprising a casing provided with a central opening and radial channels intersecting said opening, pipe-engaging members loosely mounted in said channels, means limiting movement of said members radially of the casing, and a removable expander having a tapered shank of angular cross-section provided with faces corresponding in number to the number of said pipe-engaging members, whereby said members may be forced outwardly and relative rotation prevented, said expander having an enlarged head capable of being engaged by a tool for imparting rotation thereto.

2. A wrench of the character described comprising a casing provided with a central opening and radial channels intersecting said opening, pipe-engaging members loosely mounted in said channels, means limiting movement of said members radially of the casing, and a longitudinally movable expander having means whereby said members may be adjusted outwardly and rigidly held in adjusted position, said expander being held against rotation relative to said members and having a tool engaging portion.

3. A wrench of the character described comprising a casing provided with a central opening and radial channels intersecting said opening, lugs in the respective channels, pipe-engaging members loosely mounted in said channels and having recesses receiving said lugs, whereby longitudinal movement of said members is limited, and means for adjusting said members outwardly and retaining them in adjusted position, said means being held against rotation relative to said members.

In testimony whereof we have hereunto set our hands.

PEARL McDONALD.
EMORY O. CALL.