

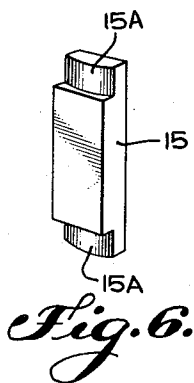
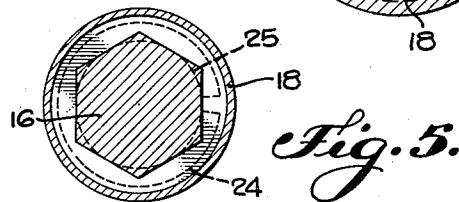
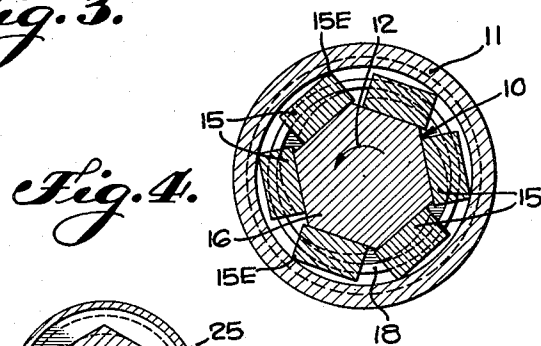
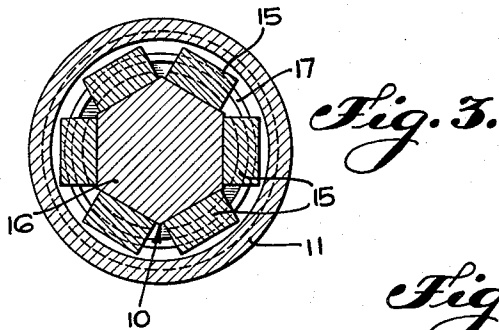
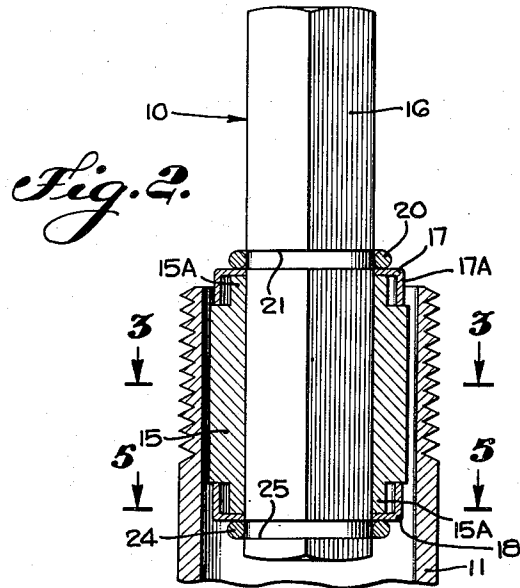
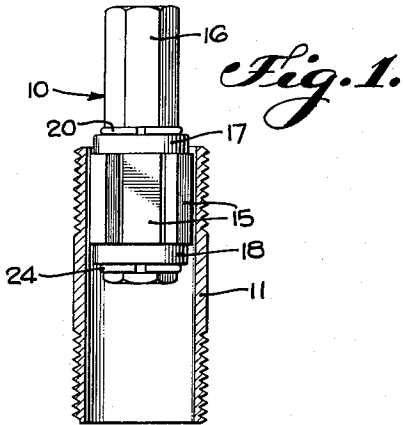
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INTERNAL PIPE WRENCH

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INTERNAL PIPE WRENCH

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3 Claims. (Cl. 81—72)

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The present invention relates to a pipe wrench functioning to engage the inner wall of a pipe or other tubular article for purposes of applying torque to the same.

It is desirable to provide a wrench for use by plumbers and other mechanics in tightening and loosening short tubular articles such as close pipe nipples. The ordinary pipe wrench used by plumbers, while effective to remove short or close nipples, causes either damage to the threads on the nipple or deformation of the nipple.

In accordance with the present invention, there is provided a wrench particularly useful by plumbers in effecting the tightening or removal of pipe sections without damage to the external threads thereon or without deforming the nipple.

It is therefore an object of the present invention to provide an improved wrench for realizing the above indicated result.

Another object of the present invention is to provide an improved tool of this character which may serve also as an "easy-out" for effecting removal of broken tubular articles and the like.

Another object of the present invention is to provide an improved tool of this character which is relatively inexpensive to manufacture and assemble.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. This invention itself, both as to its organization and manner of operation, together with further objects and advantages thereof, may be best understood by reference to the following description taken in connection with the accompanying drawings in which:

Figure 1 is a view in side elevation of a tool embodying features of the present invention inserted in operating position in a short pipe nipple, the pipe nipple being shown in section,

Figure 2 is a view similar to the view shown in Figure 1 but with a fragment of the pipe only being shown and both the pipe and the tool itself being shown in section,

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 2 with the movable elements on the tool shown in their normal position,

Figure 4 is a sectional view corresponding to the sectional view shown in Figure 3, but with the blocks of the tool in their engaged position with the internal wall of the pipe,

Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 2, and

Figure 6 is a perspective view of one of the

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blocks assembled on the tool shown in the previous figures.

The tool 10, embodying features of the present invention, is adapted to be inserted into the open end of a pipe 11 in the longitudinal direction of the pipe to assume the position corresponding to Figures 1, 2 and 3. Thereafter, the tool is rotated in the direction indicated by the arrow 12 in Figure 4 to cause the blocks 15 on the tool to automatically move from their position shown in Figure 3 to their pipe engaging position shown in Figure 4, whereby continued rotation of the tool in the direction of the arrow 12 causes the engaged pipe 11 to also turn.

The tool 10 comprises a polygonal shank 16 of stock such as hexagonal cross section material upon the faces or flats of which are disposed a corresponding number of generally rectangular blocks 15, which are of reduced thickness at each of their ends, as indicated at 15A in Figure 6, and such ends have one arcuate face and are retained in the circular retaining rings 17, 18 mounted on the shank 16. As shown in Figure 3, the width of the blocks 15 is somewhat less than the width of the flat or face of the shank 16 upon which such blocks rest. The height of such blocks is such that when inserted in the pipe there is some slight clearance between the blocks and the internal wall of the pipe, as also shown in Figure 3. In this respect, it is noted that a different tool is required for each different sized pipe.

The retaining ring 17 is provided with a central hexagonal apertured portion of slightly larger dimensions than the cross sectional dimensions of the shank 16 which it encircles. This ring 17 is prevented from moving upwardly in a longitudinal direction of the shank in Figure 2 by the resilient ring 20 resting in an annular groove 21 in the shank, the ring 20 thus serving essentially as a stop member. This retaining ring 17 is provided with an annular flange 17A which encircles and lies adjacent to the arcuate surfaces of the block ends 15A. Similarly, the retaining ring 18 is of identical structure as the retaining ring 17 and likewise co-operates with the adjacent block ends 15A to maintain the blocks in position, while of course allowing some limited movement. The ring 18 is prevented from moving downwardly in Figure 2 in the longitudinal direction of the shank by the releasable ring 24 disposed in an annular groove 25 in the shank.

It is understood that the particular means shown herein for maintaining the individual

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blocks 15 on corresponding flats or faces of the hexagonal stock, while yet allowing some limited movement of such blocks, may take other forms and shapes, and the present means which includes the members 17, 18, 20 and 24 is illustrative of such means.

It is observed that the hexagonal shank 16 thus not only provides a convenient seat for the individual blocks 15, but its protruding end being noncircular provides a convenient means to which a conventional wrench may be applied to effect turning of the shank.

It is observed further that the tool is operative for its intended purpose regardless of whether or not the tool is rotated either clockwise or counterclockwise. In other words, the tool is effective to either tighten or loosen a pipe end threaded into a pipe fitting.

Referring to Figure 4, it is observed that the back or trailing edges 15E of each one of the blocks engages the internal wall of the pipe.

While the particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

1. A tool of the character described for insertion within and for engaging and turning a hollow body, comprising: a central polygonal shank, a plurality of rectangular blocks each having a face thereof with a width somewhat less than the width of a face of the polygonal shank, each of said blocks resting on a corresponding face of the polygonal shank and extending longitudinally and parallel therewith with said block face abutting a corresponding shank face for the full width of said block, and means loosely retaining said blocks on said shank for limited movement thereon whereby increased rotational movement of said shank in one direction causes the trailing edge only of each rectangular block to increasingly penetrate said body.

2. A tool of the character described for insertion within and for engaging and turning a hollow body, comprising: a central polygonal shank

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having a plurality of faces thereon, a plurality of rectangular blocks, each resting on a corresponding one of said faces with the axis of the shank and the longitudinal axes of the blocks extending generally parallel, each block having a face with a width slightly less than the width of each face of the shank upon which such block face abuts so that corresponding shank and block faces abut for the full width of each block, each of said blocks having their ends of reduced thickness, an encircling retaining ring mounted on said shank and encircling said reduced ends of said blocks and loosely maintaining said blocks on said shank whereby increased rotational movement of said shank in one direction causes the trailing edge only of each rectangular block to increasingly penetrate said body.

3. In a tool of the character described for insertion within and for turning a body, comprising: a central polygonal shank, a plurality of rectangular blocks each having a face thereof with a width somewhat less than the width of a face of the polygonal shank, each of said blocks resting on a corresponding face of the polygonal shank and extending longitudinally and parallel therewith with said block face abutting a corresponding shank face for the full width of said block, means loosely maintaining said blocks on said shank so that each block may slide on its corresponding shank face, each of said blocks having only a trailing corner thereof for engagement with the internal wall of said body whereby rotational movement of said shank in one direction causes sliding movement of the rectangular blocks on the shank to cause said trailing corner only of each block to engage said internal wall.

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