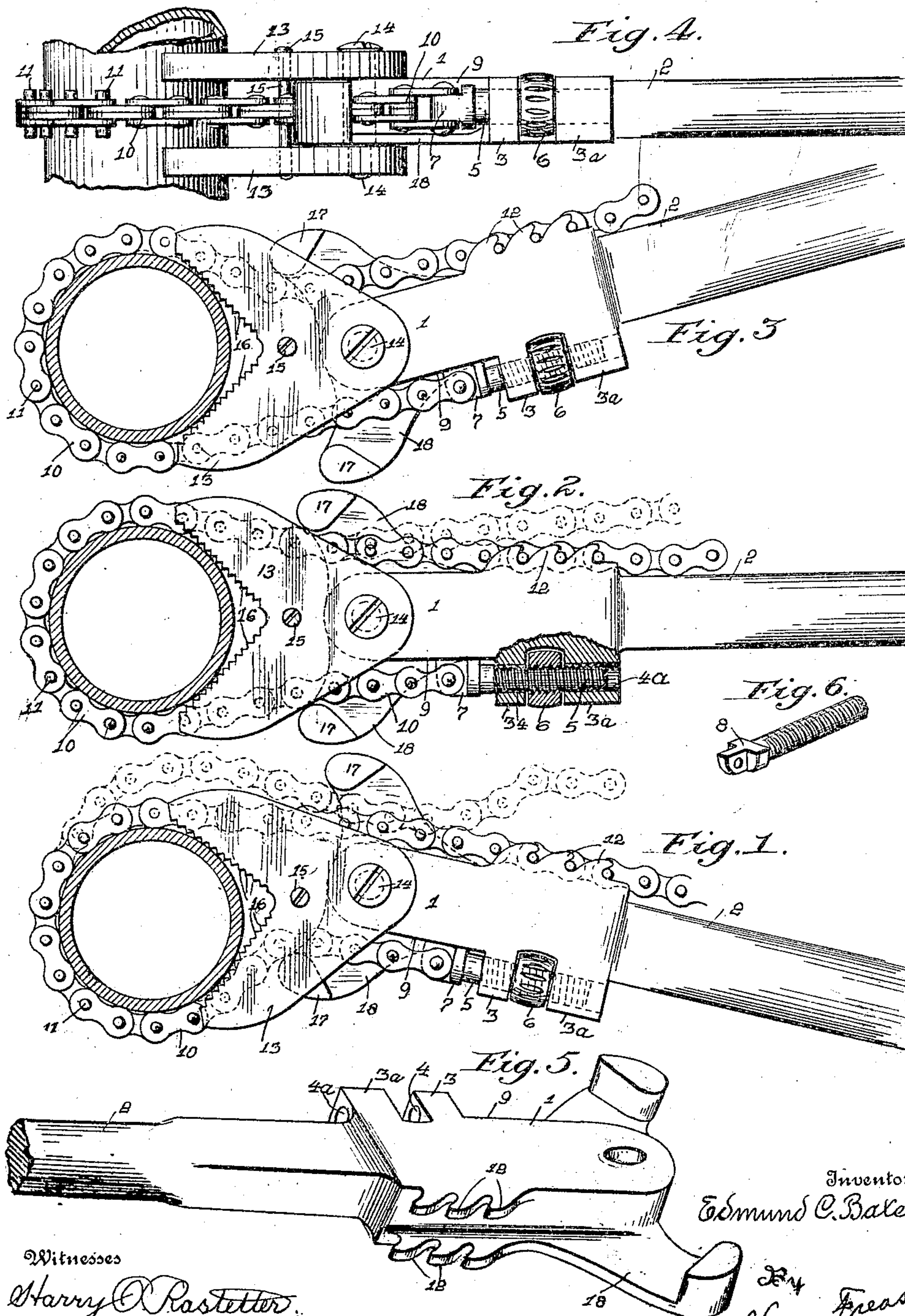


E. C. BATES.  
PIPE WRENCH.  
APPLICATION FILED MAR. 12, 1907.

2 SHEETS—SHEET 1.



Witnesses  
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No. 855,380.

PATENTED MAY 28, 1907.

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2 SHEETS—SHEET 2.

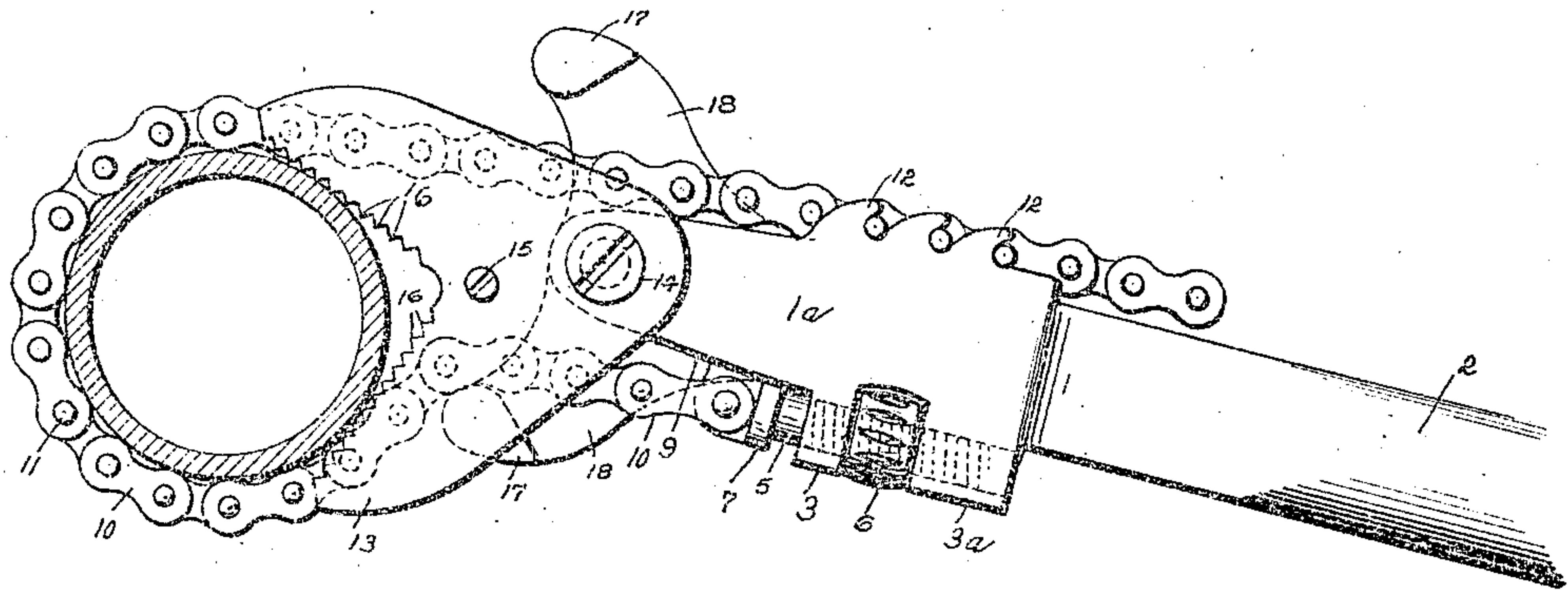


Fig. 8.

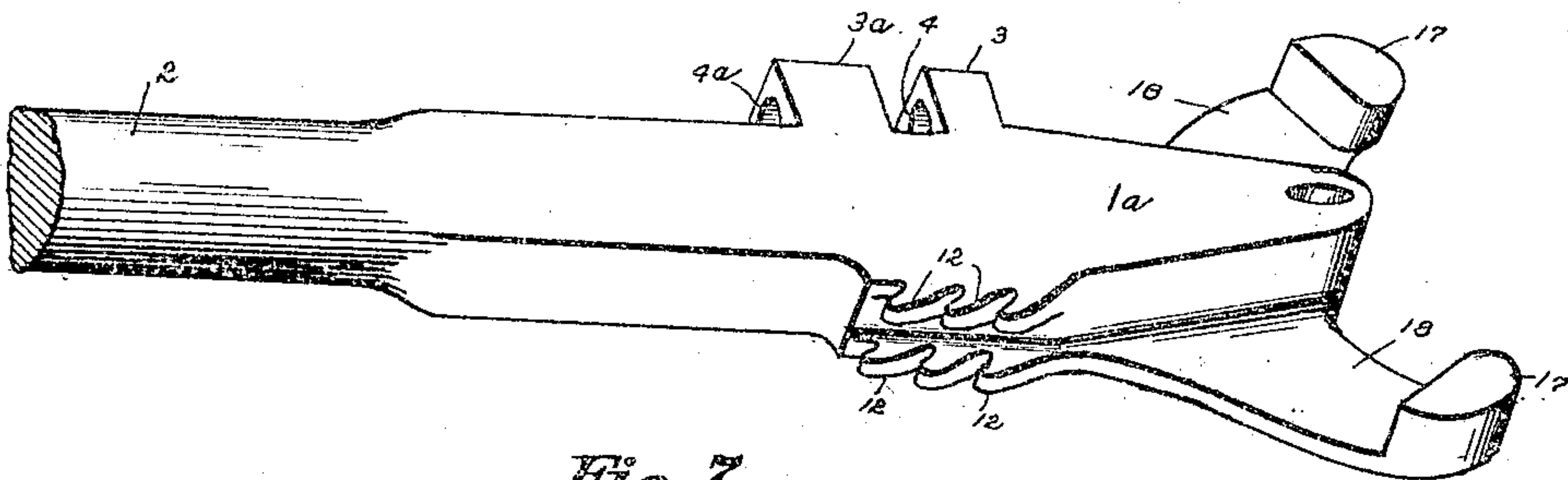


Fig. 7.

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# UNITED STATES PATENT OFFICE.

EDMUND C. BATES, OF ALLIANCE, OHIO.

## PIPE-WRENCH.

No. 855,380.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed March 12, 1907. Serial No. 361,960.

*To all whom it may concern:*

Be it known that I, EDMUND C. BATES, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Pipe-Wrenches, of which the following is a specification.

This invention relates to the class of wrenches wherein a chain or other flexible member is employed to pass around the pipe or other object to be gripped; and the objects of the improvement are to provide means for easily applying and removing the wrench to and from the pipe and to readily take up all looseness of the chain when connected with the handle-bar and when the latter is in the normal or radial position, and furthermore to provide means for forcefully increasing the circumferential contact and the gripping tension of the chain around the pipe when the handle-bar is deflected one way or the other from the normal radial position, whereby the wrench is adapted for use in turning the pipe in either direction without any adjustment or manipulation excepting only the rotation of the handle bar in the desired direction.

These general objects and other minor ones are attained by the construction, mechanism and arrangement illustrated in the accompanying drawing, in which:

Figure 1 is a plan view of one side of the wrench-head and part of the handle-bar, showing the same applied to a section of pipe, with the handle bar deflected one way from its normal radial position for use in gripping and turning the pipe in the same direction, and illustrating by broken lines the method of placing the chain in position around the pipe; Fig. 2, a similar view showing the handle-bar in its normal radial position, and illustrating the method of connecting and adjusting the chain to the pipe; Fig. 3, a similar view showing the handle-bar deflected the other way from its normal radial position and illustrating the use of the wrench for gripping and turning the pipe in the same direction; Fig. 4, an edge view of the wrench-head and part of the handle-bar, showing the same applied to a fragmentary section of pipe; Fig. 5, a detached perspective view of the head of the handle-bar; Fig. 6, a detached perspective view of the chain adjusting bolt; Fig. 7, a detached perspective view of the head of the handle-bar, showing the same made with a tapered end; and Fig. 8, a plan

view similar to Fig. 1, but showing the handle-bar with a tapered end.

Similar numerals refer to similar parts throughout the drawings.

The head 1 of the handle-bar 2 is provided with the adjacently located lugs 3 and 3<sup>a</sup> on one edge, in the longitudinal apertures 4 and 4<sup>a</sup> of which lugs the chain-bolt 5 is located and adapted to be longitudinally adjusted. The thumb nut 6 is located between the lugs 3 and 3<sup>a</sup>, and is adapted to operate on the screw threaded shank of the bolt, by means of which nut the bolt can be readily moved or adjusted endwise of the handle-bar. The head 7 of the bolt is preferably formed with the flat face 8 which is located to abut the flat edge 9 of the handle-bar-head, which contact stops the bolt against rotation and permits its positive endwise adjustment by means of the thumb-nut.

The gripping chain 10 is attached at one end to the head of the adjusting-bolt. This chain may be of any of the kinds usually employed in wrenches of this class, and as shown is composed of a series of pairs of similar flat links pivoted at the ends to each other, the separate links of alternate pairs being located outside of the links of the intervening pairs. The ends of the pivots of the several links, excepting only those at or near the attached end of the chain, are extended beyond the sides of the outer links, thus forming the posts or pins 11 which constitute a convenient means for connecting the free end of the chain to the handle-bar. When the kind of chain illustrated is employed this connection is preferably made by means of the series of pairs of hooks 12 formed or attached on the edge of the handle-bar opposite the adjusting-bolt, and as shown, the hooks of each pair are laterally spaced apart so that the body of the chain can be freely entered between them and at the same time the extended ends of one of the pivot pins can be engaged by the opposite hooks; and the pairs of hooks are spaced apart along the handle-bar to correspond with the pitch of the chain, so that two or more of the pivot pins can be contemporaneously engaged by the hooks.

A bearing shoe is pivoted on the end of the handle-bar, and for use with a single chain, as illustrated, this shoe is preferably composed of the two parallel jaw-plates 13, one located on each side of the handle-bar to which they are both pivoted as by means of



the screw-journal 14. The jaw-plates are laterally spaced apart to permit the chain and its extended pivot-pins to enter freely between them, and they are preferably joined together below the end of the handle-bar as by means of the connecting post or screw 15, so that they will be held opposite to each other and will operate in unison. The concavity of each jaw-plate is preferably formed V-shaped, as shown, and is also provided with the serrations 16, so that the two plates together form a shoe adapted to bear and bite against the side of pipes of various diameters.

The flexing-lugs 17 are formed or attached adjacent to the edges of the handle-bar and they are preferably located opposite a point below the pivot of the bearing-shoe. As shown, these lugs are formed integral with the handle-bar to which they are joined by the webs 18 extending from one side of the edges thereof, thus forming free channels, open on one side, between the end of the handle-bar and the adjacent lugs, in which channels the chain is adapted to be freely entered and to operate.

The parts of the wrench are so proportioned and arranged that when it is applied to a pipe and the free end of the chain is engaged with the connecting-hooks and the handle-bar is held in a radial position with reference to the pipe, as shown in Fig. 2, the flexing lugs will only be in slight if any pressing contact with the adjoining or adjacent portions of the chain. In this relation of the parts, the grip of the wrench on the pipe is so slight that it may be moved along the pipe, or rotated thereon to any desired position or for the purpose of taking a new grip on the pipe. But when the handle-bar is rotated on the shoe-pivot, either one way, as shown in Fig. 1, or the other way, as shown in Fig. 3, the lug adjacent to the edge toward which the bar is inclined impinges the outer side of the adjacent or adjoining part of the chain, and by flexing the same forces it inward, thus positively tightening its tension around the pipe and at the same time increasing the circumferential contact of the chain thereon. While the rotation of the handle-bar from its normal radial position causes one lug to flex the chain, the opposite lug is at the same time drawn away from the adjoining or adjacent part of the chain, so that the chain is never drawn outward to lessen its circumferential contact on that side of the pipe.

The end of the handle-bar may be rounded on a circle concentric with the shoe-pivot, as shown in Figs. 1, 2, 3 and 5, or it may be tapered as shown in Fig's. 7 and 8; and the chain on the side that is not impinged will either roll around the end of the handle-bar as on a reel in the first case and thus increase its tension around the pipe, or will assume a straight line between the side of the pipe and

connecting-hooks in the latter case. The chain will never be carried outward to lessen its circumferential contact with the pipe in either case; and after the chain is free from the outwardly moving flexing-lug, any further rotation of the handle-bar will carry the chain inward and wrap it further around the pipe, thus increasing its circumferential contact thereon, which result is attained more fully when the end of the handle-bar is tapered, as shown in Fig. 8.

It is evident that the wrench can be readily applied by presenting the bearing-shoe to the pipe and then wrapping the chain around the pipe, at the same time deflecting the handle-bar on the shoe-pivot toward the edge on which the chain is attached, so that the open side of the channel between the end of the handle-bar and the flexing-lug on the opposite side of the bar is freely exposed outside the edge of the bearing-shoe, whereupon the free end of the chain can then be entered in this channel, as shown by broken lines in Fig. 1. The chain can then be drawn approximately taut, as shown by broken lines in Fig. 2, and engaged with the connecting-hooks, as shown by full lines in the same figure. As the connection of the free end of the chain with the hooks can only be made at intervals corresponding with the pitch of the chain, any undesirable slack there may be in the chain after it is thus connected, can be readily taken up, by merely giving the thumb-nut on the adjusting-bolt a few turns in the proper direction. It is also evident that the wrench can be readily removed from the pipe by merely reversing the method described above for applying it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A wrench comprising a handle-bar, a bearing-shoe pivoted on the end of the bar, a flexible member forming a loop on the same end of the bar and having one end adjustably attached on one edge of the bar and detachably connected on the other edge of the bar, and lugs on the bar outside the flexible member and adapted to flex the same inward when the bar is rotated one way or the other on the shoe-pivot.

2. A wrench comprising a handle-bar, a bearing-shoe pivoted on the end of the bar, a flexible member forming a loop on the same end of the bar and having one end attached on one edge of the bar and detachably connected on the other edge of the bar, and lugs on the bar outside the flexible member and adapted to flex the same inward when the bar is rotated one way or the other on the shoe-pivot.

3. A wrench comprising a handle-bar, a bearing-shoe pivoted on the end of the bar, a flexible member forming a loop on the same end of the bar and having one end adjustably attached on one edge of the bar and connect-



ed on the other edge of the bar, and lugs on the bar outside the flexible member and adapted to flex the same inward when the bar is rotated one way or the other on the shoe-pivot.

4. A wrench comprising a handle-bar having a tapered end, a bearing-shoe pivoted on the same end of the bar, a flexible member forming a loop on the same end of the bar and connected on the edges thereof, and lugs on the bar outside the flexible-member adapted to flex the same inward when the bar is rotated one way or the other on the shoe-pivot.

5. A wrench comprising a handle-bar, a bearing-shoe pivoted on the end of the bar, a flexible member forming a loop on the same end of the bar and connected on the edges thereof, and lugs on the bar outside the flexible-member adapted to flex the same inward when the bar is rotated one way or the other on the shoe-pivot.

6. A wrench comprising a handle-bar having a tapered end, a bearing-shoe pivoted on the same end of the bar, a flexible member forming a loop on the same end of the bar

and having its ends connected therewith, and a lug on the edge of the bar outside the flexible-member and adapted to flex the same inward by the rotation of the bar on the shoe-pivot.

7. A wrench comprising a handle-bar, a bearing shoe pivoted on the end of the bar, a flexible member forming a loop on the same end of the bar and having its ends connected therewith, and a lug on the edge of the bar outside the flexible-member and adapted to flex the same inward by the rotation of the bar on the shoe-pivot.

8. In a wrench having a handle-bar with a bearing-shoe pivoted on the end thereof, an endwise adjustable-bolt on one edge of the bar, and a flexible member forming a loop on the same end of the bar and having one end attached to the bolt with means for detachably connecting the other end to the opposite edge of the bar.

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