(No Model.)

B. DONAHUE.

WRENCH.

No. 454,612. Patented June 23, 1891.

Fig. 1.

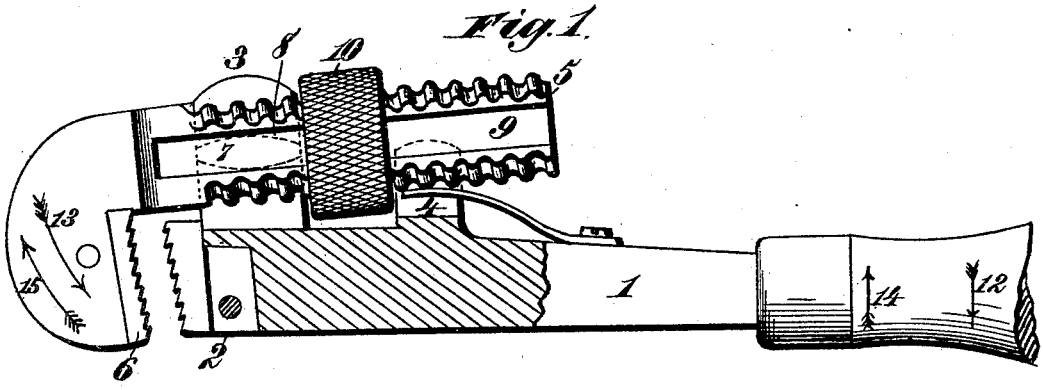


Fig. 2.

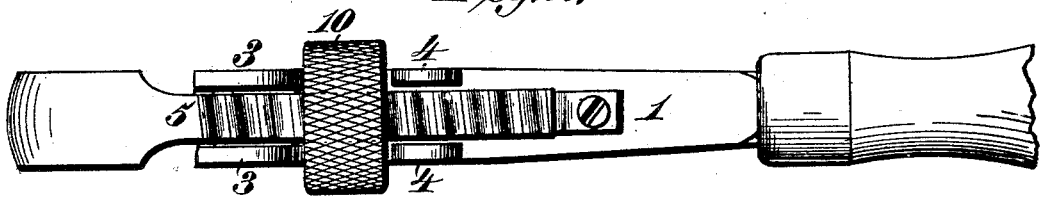


Fig. 3.

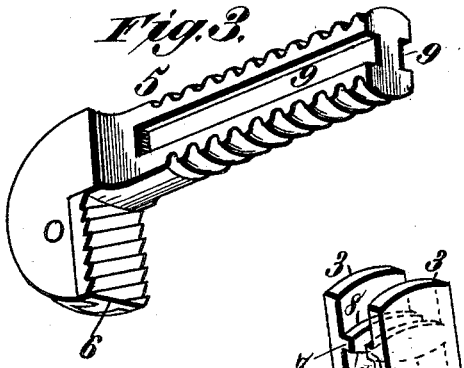
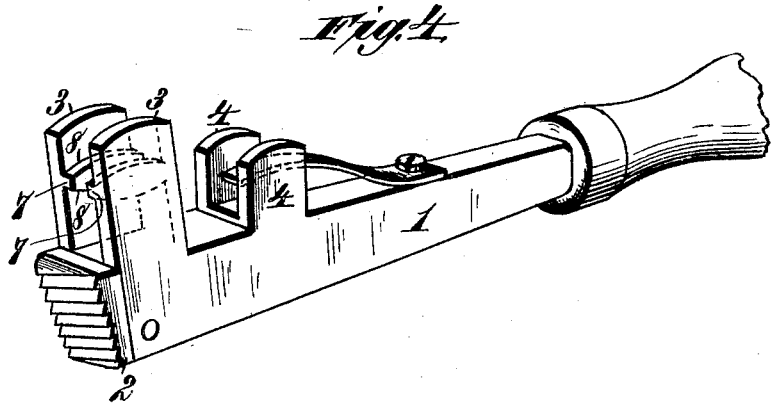


Fig. 4.



Witnesses.
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J. A. Rutherford

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Atty.

UNITED STATES PATENT OFFICE.

BERNARD DONAHUE, OF YONKERS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KATE F. DONAHUE, OF SAME PLACE.

WRENCH.

SPECIFICATION forming part of Letters Patent No. 454,612, dated June 23, 1891.

Application filed March 8, 1890. Serial No. 343,086. (No model.)

To all whom it may concern:

Be it known that I, BERNARD DONAHUE, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to that type of pipe-wrenches wherein a handle-stock is provided at one end with a gripping-jaw and a lateral guide box or frame containing a screw-nut engaging a lengthwise-movable screw-shank which carries a rigid or rigidly-attached jaw in such manner that by rotating the nut the screw-shank is moved lengthwise and its jaw caused to advance or recede for accommodating pipes of varying diameter.

The object of my invention is to provide novel means whereby the jaw on the screw-shank of a pipe-wrench of the type alluded to is rendered capable of gripping and releasing the pipe as the wrench is swung back and forth in the arc of a circle, so that the movement of the wrench in one direction causes the jaw of the screw-shank to bind and grip the pipe to turn the same, and the movement in the reverse direction causes such jaw to release its binding and gripping action to take a fresh purchase or grip on the pipe.

The invention also has for its object to render this type of wrench stronger and more durable and effective in operation.

To accomplish these objects my invention involves the features of construction, the combination or arrangement of devices, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of a pipe-wrench embodying my invention. Fig. 2 is an edge view of the same. Fig. 3 is a detail perspective of the adjustable jaw-carrying shank. Fig. 4 is a similar view of the handle-stock.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a handle-stock having at one end a stationary toothed jaw 2 and a laterally-projecting housing or guide-frame, which, as here shown, comprises a pair of long flanges 3 and a pair of short flanges 4, between which is adapted to move lengthwise a screw-shank 5, carrying at its outer end a rigid or rigidly-attached toothed jaw 6. I prefer to construct the acting-face of each jaw of a steel plate or block provided with diagonally-arranged teeth and a tongue entering a groove and secured therein by a transverse pin; but as I do not confine myself to this specific construction further explanation in this respect is not deemed essential. The toothed jaw 2 on the handle-stock is, however, a rigidly-attached fixture to provide strength, durability, and efficiency. The flanges 3 are provided with a pivot or bearing, which, as shown, is composed of a lug 7, formed integral with the inside of each flange and having opposite convex or curved edges 8. These lugs extend, respectively, into two longitudinal grooves 9, formed in opposite sides of the screw-shank 5, which passes through the screw-nut 10, located between and bearing against the adjacent edges of the two pairs of flanges 3 and 4 in such manner that the screw-shank can oscillate on the lugs 7 as a pivot or bearing and also be moved lengthwise thereupon through the medium of the rotating nut. The grooved sides of the screw-shank may be flattened, and the screw-thread is of that type known as a "mutilated thread," while the nut is preferably circular and milled on its external surface.

The lugs 7 and 8 extend entirely across the full width of the flanges 3 and have their inner and outer edges curved in the arcs of circles, each with a radius from a center considerably outside of the axial line of the grooves 9 in the sliding and oscillating screw-shank 5. By this construction I prevent the wrench from catching in releasing it for a fresh grip, while the strength of the structure is materially increased, and I avoid forming through-slots in the screw-shank, as is common where a transverse cylindrical bolt is used as a pivot. The extension of the lugs 7 and 8 across the flanges 3 and the formation of their inner and outer edges in the arcs of circles struck from centers considerably outside of or away from the axial line of the grooves in the screw-shank provides for a quick release of the wrench and

further secures bearings for the oscillating jaw along the length of the lugs, which is important in the gripping action of the wrench, since the oscillating shank comes to a fixed bearing on the inner and outer convex surfaces of the lugs 7 and 8 before the screw-shank strikes the inner edge of the stationary toothed jaw 2 or the inner edge of the handle-stock. In these respects my construction differs substantially from and is an improvement on that type of wrenches where a cylindrical bolt extends transversely through a slot in the sliding and oscillating screw-shank, as in the latter construction the screw-threads of the shank are injured by striking a fixed part of the wrench and a firm grip cannot be obtained, while the slotting of the shank materially weakens the wrench, and is therefore objectionable.

I prefer to employ a leaf or other suitable spring to act on the tail end of the screw-shank and press it outward for the purpose of normally holding the toothed face of the jaw on the screw-shank parallel with the toothed face of the stationary jaw on the handle-stock.

If the wrench be in the position shown in Fig. 1 and engaged with a pipe, the downward movement of the handle-stock in the direction of the arrow 12 tends to swing the screw-shank on the pivot or bearing and move the jaw 6 thereon in the direction of the arrow 13, thereby binding, gripping, and turning the pipe, while the upward movement of the handle-stock in the direction of the arrow 14 causes the screw-shank to swing on the pivot or bearing and moves the jaw 6 in the direction of the arrow 15 to release the binding and gripping action and place the parts in position for a fresh purchase or grip on the pipe. The construction is also such, as will be obvious, that the swinging movement of the screw-shank on the pivot or bearing can be effected by the workman pressing with the finger on the tail end of the screw-shank, which is a desirable feature for this type of wrench, since it permits the space between the jaws to be varied in a limited degree for engaging and disengaging pipes.

The lateral housing or guide-frame on the handle-stock may be open at the outer end, or rather the side flanges may be disconnected at their outer extremities; but, while the construction shown is preferred, I do not confine myself thereto, for the gist of my invention resides, not simply in a lengthwise-sliding screw-shank carrying a jaw and not simply in a wrench-jaw adapted to swing on a pivot, but the grooved shank adjustable lengthwise and oscillative upon a pivot or bearing composed of a lug formed integral with and extending across the inside of each flange 3 and having its inner and outer edges formed in the arcs of circles struck from centers outside the axial line of the grooves 9 in the sliding and oscillating screw-shank for the purposes hereinbefore explained.

The jaw 2 is so arranged that it has a bearing throughout its extent on the end of the handle-stock, and hence the entire thrust or pressure on this jaw is squarely borne by the handle-stock, thereby providing a strong and durable construction.

What I claim as my invention is—

1. In a wrench, the combination, with the sliding and oscillating longitudinally-grooved screw-shank having a fixed jaw, of the stationary jaw provided with side flanges having on both of their edges convex or rounded bearing-surfaces on which the oscillating jaw can rock, and an adjusting-nut for operating the movable jaw, substantially as shown and described.

2. In a pipe-wrench, the combination, with the sliding and oscillating longitudinally-grooved screw-shank having a toothed jaw, of the stationary jaw provided with side flanges, each formed integral with a lug extending across its inside and having its inner and outer edges curved in the arcs of circles struck from centers outside the axial line of the grooves in the sliding and oscillating screw-shank, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BERNARD DONAHUE.

Witnesses:
T. SCHERLL,
JOHN C. DONOHUE.