(No Model.)

# S. H. HACKNEY.

## WRENCH.

No. 545,016. Patented Aug. 20, 1895.

Fig. 1.

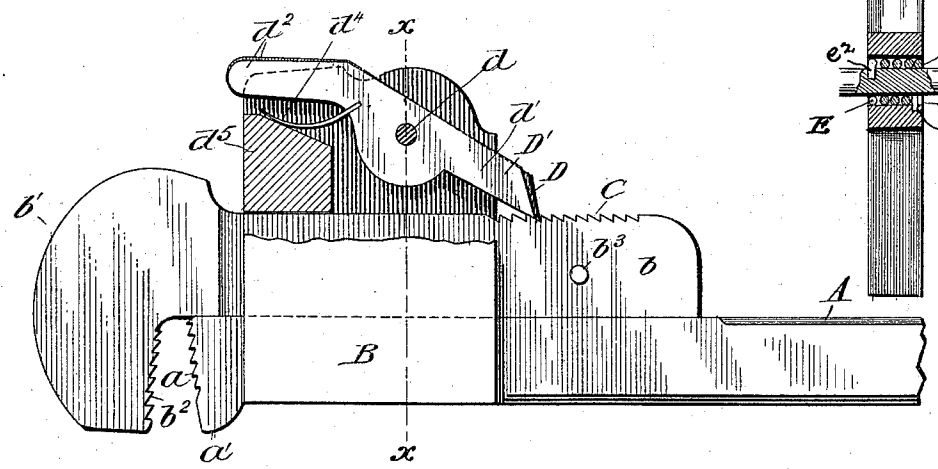



Fig. 6.




Fig. 2.

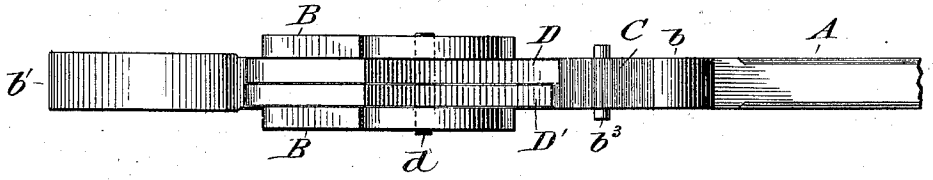



Fig. 3.

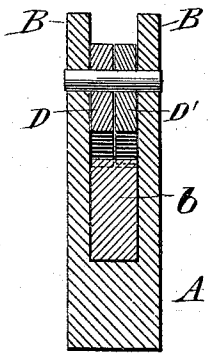



Fig. 4.

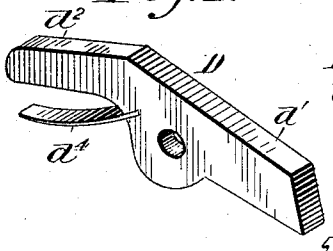
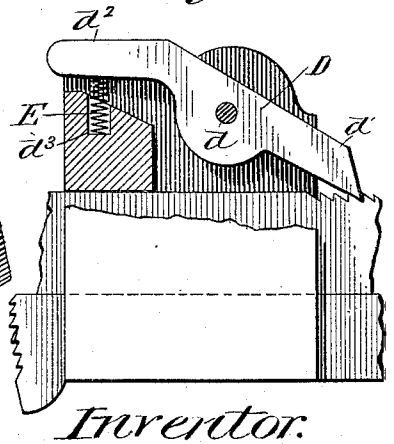



Fig. 5.




Witnesses:
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# UNITED STATES PATENT OFFICE.

SAMUEL H. HACKNEY, OF PAOLI, INDIANA, ASSIGNOR OF ONE-HALF TO THOMAS B. BUSKIRK, OF SAME PLACE.

## WRENCH.

SPECIFICATION forming part of Letters Patent No. 545,016, dated August 20, 1895.

Application filed July 21, 1894. Serial No. 518,207. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL H. HACKNEY, a citizen of the United States, residing at Paoli, in the county of Orange and State of Indiana, have invented certain new and useful Improvements in Wrenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in wrenches, and has for its object the production of an improved wrench, the jaws of which may be quickly adjusted to various-size pipes, and a nicety of adjustment is obtained, preventing the slipping of the jaws on the pipe or the like when the wrench is being used.

To these ends the invention comprises the novel features of construction and also the detail combination and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my improved wrench with parts broken away. Fig. 2 is a top edge view thereof. Fig. 3 is a transverse sectional view on the line $x$ $x$, Fig. 1. Fig. 4 is a view of one of the pawls detached. Fig. 5 is a view of a slightly-modified form thereof. Fig. 6 is a view of another modification.

Referring to the drawings, A designates the shank or handle provided at one end with teeth $a$ and a projecting lip $a'$, said end forming the rigid jaw of the wrench.

B B designate two keeper plates or wings, one on each side of shank A, to which they are secured, but they are preferably made integral therewith. Between these wings is designed to move the shank $b$ of the movable jaw $b'$, which is provided with teeth $b^2$ on its inner surface. The shank $b$ is provided with a transverse pin $b^3$, having projecting ends for limiting the movement thereof by contact of said ends with said keeper-plates.

D D′ designate two differential pawls pivoted between the keeper-plates B on a cross-pin $d$. These pawls each consist of an inner arm $d'$ and an outer arm $d^2$, extended at a slight angle from said arm $d'$. The lower inner ends of arms $d'$ are normally held in engagement with a series of rack-teeth C on the edge of shank $b$ by means of springs $d^4$, secured to arms $d^2$ and bearing against a block $d^5$, secured between the keeper-plates B. The arm $d'$ of pawl D is slightly longer than that of pawl D′. The object of this is to render the jaws of the wrench capable of very fine adjustment and prevent all loose play of the parts when the wrench is in use. This is accomplished by the long and short pawls alternately engaging the teeth C as the shank $b$ is moved downward, thus permitting an adjustment of less than the width of each tooth on said shank. In fact, the two pawls secure the same nicety of adjustment as would result from making the rack-teeth of the movable jaw but half-width. While I have shown springs $d^4$ as plate-springs, it is obvious that the use of coil-springs secured in suitable recesses of block C is clearly within the scope of my invention.

In lieu of the plate-spring $d^4$, a coil-spring E for each pawl may be employed. Each of these springs E is secured in a recess $d^3$ of block $d^5$, as shown in Fig. 5.

In Fig. 6 I have shown a second modification of the springs. In this form each pawl has the opening $e$ for the passage of the cross-pin $d$ slightly enlarged to receive a coil-spring $e'$, which encircles said cross-pin, said spring being secured at one end $e^2$ to said cross-pin, the other end $e^3$ thereof being secured in a suitable recess in said pawl.

In using my improved wrench the operator first presses in the outer arms $d^2$ of the pawls, so as to release the inner ends of said pawls from engagement with the teeth C, whereupon the movable jaw $b'$ may be moved up any desired extent. The wrench is then adjusted to the pipe or other article to be operated upon by pressing upon the movable jaw, so as to cause the same to slide inwardly until the teeth thereof engage said pipe, where it will be rigidly held by the pawls D D′. The pawls are so arranged as to slide over the teeth in the inward movement of said jaw, but will engage said teeth the instant that pressure is exerted in the opposite direction.

From what has been said it is obvious that I have produced a pipe-wrench which is inexpensive, simple in construction, and efficient

in operation, and which is capable of rapid and accurate adjustment.

I claim as my invention—

1. The herein-described improved pipe-wrench, comprising the shank or handle having a rigid jaw, the keeper plates or wings formed integral with said shank or handle, the movable jaw having its shank fitted between said keeper-plates or wings and provided with teeth on its edge, and the differential pawls having inner and outer arms extended at different angles, substantially as set forth, said inner arms being held in engagement with the toothed edge of said shank, as stated.

2. The herein-described improved wrench, comprising the shank or handle having the rigid jaw, the keeper-plates or wings extended therefrom and formed integral therewith, the movable jaw, the shank thereof fitted between said keeper-plates or wings and having teeth on its edge, the differential pawls pivoted between said keeper-plates or wings, said pawls having inner and outer arms extended at different angles, and the springs for normally holding the inner ends of said pawls in engagement with the toothed edge of said shank, substantially as set forth.

3. The herein-described improved pipe-wrench, comprising the shank or handle having the rigid jaw, the keeper-plates or wings extended therefrom and formed integral therewith, the movable jaw, the shank thereof movable between said keeper-plates or wings and having teeth on its edge, the block secured between said keeper plates or wings, two differential pawls having inner and outer arms extended at different angles, one of said pawls being longer than the other, and the springs bearing against said block and the outer arms of said pawls, whereby the inner ends of both of said pawls are alternately held in engagement with said rack teeth, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL H. HACKNEY.

Witnesses:
LOIS H. BUSKIRK,
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