O. A. CHRISTOPHERSON.

WRENCH.

APPLICATION FILED OCT. 25, 1913.

1,099,427. Patented June 9, 1914.

Fig. 1.

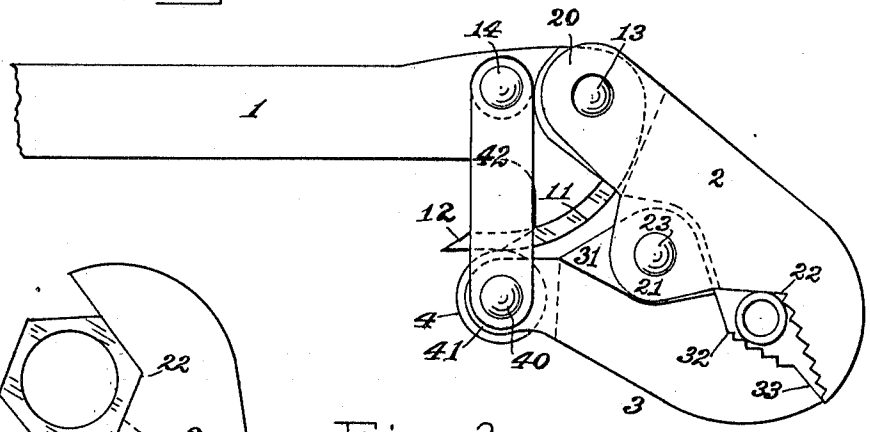
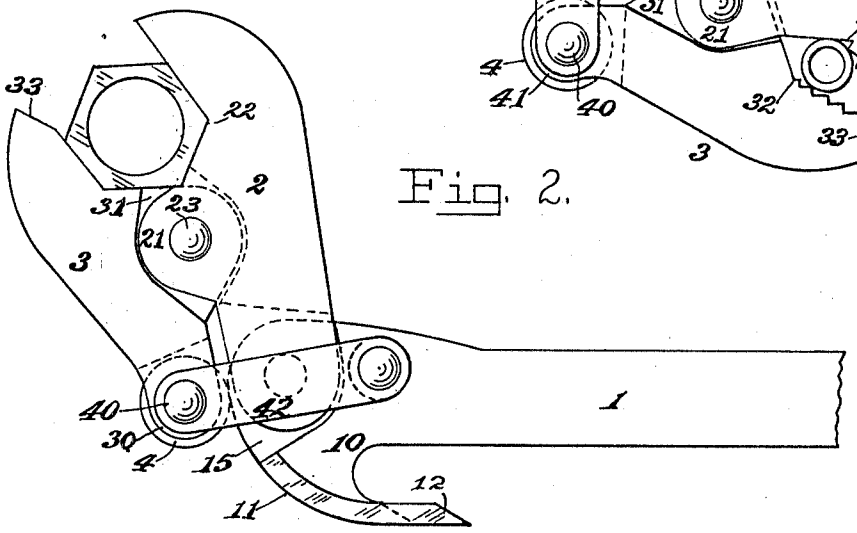


Fig. 2.



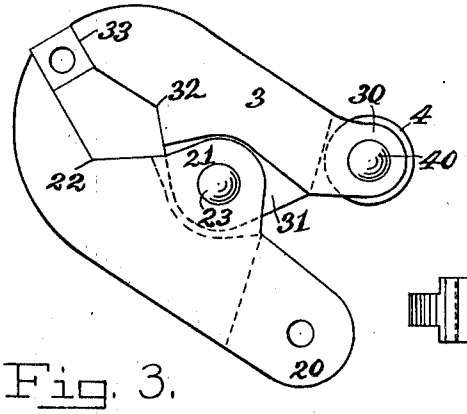


Fig. 3.

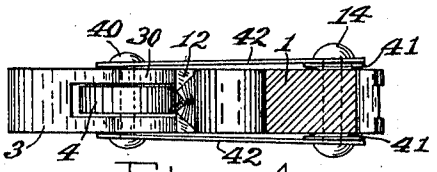


Fig. 4.

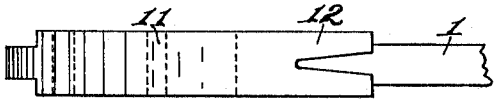


Fig. 5.

Witnesses

Charles L. Reynolds.

Ida Johnston.

Inventor

Ole A. Christopherson

by Henry L. Reynolds.

Attorney.

UNITED STATES PATENT OFFICE.

OLE A. CHRISTOPHERSON, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-FOURTH TO FRED W. CHANDLER AND ONE-FOURTH TO OLUF LARSEN, BOTH OF SEATTLE, WASHINGTON.

WRENCH.

1,099,427. Specification of Letters Patent. Patented June 9, 1914.

Application filed October 25, 1913. Serial No. 797,343.

To all whom it may concern:

Be it known that I, OLE A. CHRISTOPHERSON, a citizen of the United States, and resident of the city of Seattle, King county, Washington, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

My invention relates to wrenches, and consists of certain improvements in that type of wrenches which employ jaws pivoted to each other and which open and close to fit nuts or pipes of differing sizes.

The object of my invention is to improve and simplify such a wrench and to make it of such design that it shall be strong and easy to make and generally efficient and durable.

My invention comprises the various parts and combinations of parts which will be hereinafter described and particularly pointed out in the claim.

In the accompanying drawings I have shown my invention embodied in the form which is now preferred by me.

Figure 1 is a side view of the wrench with the jaws in their extreme closed position. Fig. 2 is a similar view showing the jaws in their extreme open position. Fig. 3 shows the two jaws in an intermediate position and how the supplemental face at the outer end of one of the jaws coöperates with the other jaw to hold a small nut. Fig. 4 is a section of the handle looking toward and showing the head and jaws. Fig. 5 is an edge view of the head end of the handle showing the claws.

To one end of the handle 1 is pivoted the primary jaw 2, by a pivot 13. The secondary jaw 3 is pivoted to the primary jaw, the pivot 23 by which they are connected being located at a point intermediate their ends, preferably at about the middle point of their length. This pivot point is also located somewhat to one side of the main body of the jaws. I have shown one of the jaws, as the primary jaw 2, as provided with two separated ears 21 and the secondary jaw 3 as provided with a central ear 31 which fits between the ears 21 of the primary jaw, a pivot pin 23 connecting them together. The outer end of each jaw has its inner face, or that face which opposes the corresponding face of the other jaw, provided with a reëntrant angle, as 22 and 32, which is preferably such as will fit the corners of nuts, or 120°. Part or all of the inner faces of these jaws, may be toothed, as shown in Fig. 1, so as to enable a secure grip to be had upon pipes.

The inner or tail end of the secondary jaw 3, is connected with the handle by means of links 42 and pivot pins 40 and 14, so that the inner or tail end of the secondary jaw is compelled to swing in an arc of a circle having the pin 14 as a center. This pivot pin 14 is inward from the pivot pin 13 by which the primary jaw is pivoted to the handle, the result of the different location of these pins being that, as the jaws are swung upon the handle, their outer ends will be separated or brought together, in accordance with the direction of motion. The link connection between the handle and the secondary jaw, would be sufficient to obtain the proper movement of the jaws relative to each other, but I have shown additional means which act to secure the same result. This consists of a curved edge surface 11 of the head of the handle, which is made eccentric relative to the pivot point 13 of the primary jaw but concentric to the pivot point 40 of the link, if the link is also used. The inner or tail end of the secondary jaw, is designed to be supported by engagement with the curved surface 11 of the handle. This may be by a direct sliding engagement of the tail end 30, of the jaw with the surface 11, or, as I prefer, by engagement of the curved surface 11 by a roller 4 which is journaled upon the pin 40 and between ears formed by slitting this end of the jaw. This surface 11 should be an arc of a circle having its center coinciding with the pivot connection between the links 42 and the handle, which pivot point is inward from the point of pivoting between the handle and the primary jaw. I also prefer that this cam-like projection be extended to form a semi-detached slotted claw 12.

The inner or gripping face of one of the jaws, herein shown as the secondary jaw 3, has a small section located at the outermost end thereof, beveled back of the direction of the face of the jaw inward thereof, thus forming a face 33 which is adapted to coöperate with the opposite jaw, to engage small nuts, as is shown in Fig. 3. The angle of bevel of the face 33 should be such as will bring it parallel with the coöpera-

ing portion of the face of the opposite jaw, in the average position in which it would be used.

The proportions of the parts of the jaws and the manner of mounting them upon the handle and controlling their swinging, are such that they will securely engage and hold any nut or pipe within the range of their capacity.

To provide a sufficient friction to hold the jaws in whatever position they may be set until applied to the nut or pipe, I may provide spring washers 41 upon the pivot pin 40, or 14, or both. These will suffice, if properly adjusted, to hold the jaws in set position until applied to the work.

The links 42 serve two purposes, one being to bind the tail end of the secondary jaw to the handle, so that the jaws will be certain to open when swung in one direction, and the other to insure their closing when swung in the opposite direction. The cam of eccentric formed by the curved surface 11 of the handle, serves one of these purposes, that of closing the jaws, but will not open them. It is contemplated that the links may be employed without the cam surface 11 if desired, or that they may be employed only to insure the opening of the jaws, either being within the scope of my invention.

What I claim as my invention and desire to patent is;

In a wrench, in combination, a handle, a primary jaw, the handle and jaw having complemental pivot ears at an end of each and a pivot pin connecting them, the handle having an outer arcuate edge face having its center of curvature inward in the direction of the handle from the pivot point of the primary jaw, a secondary jaw, both said jaws having complemental pivot ears projecting from their middle portions toward each other and a pivot pin connecting them, the inner end of the secondary jaw carrying a roller engaging the arcuate side surface of the handle, and links pivoted upon the handle at the center of said arcuate surface.

In testimony whereof I have hereunto affixed my signature this 18th day of October, 1913.

OLE A. CHRISTOPHERSON.

Witnesses:
H. L. Reynolds,
Penrose L. McElwain.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."