

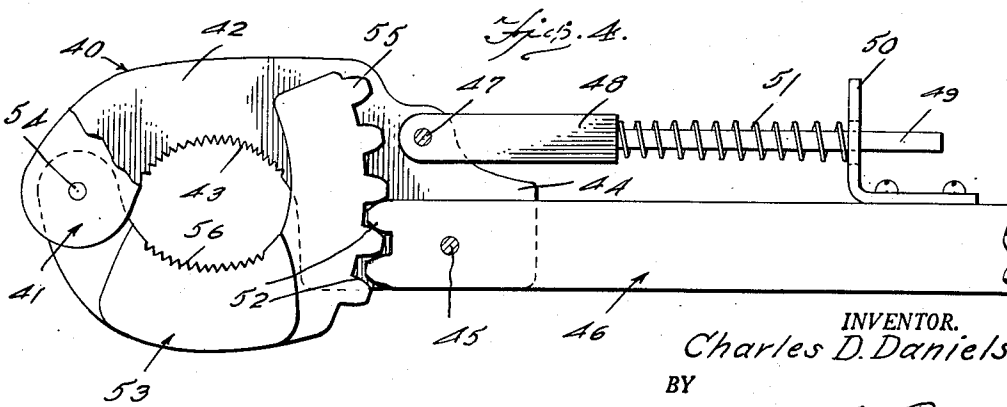
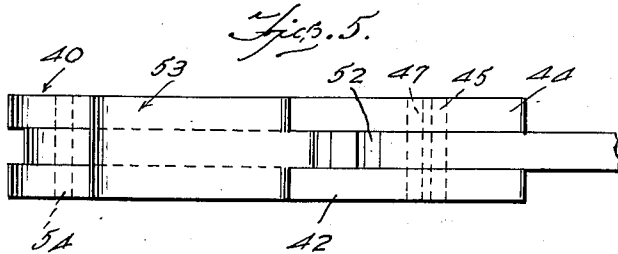
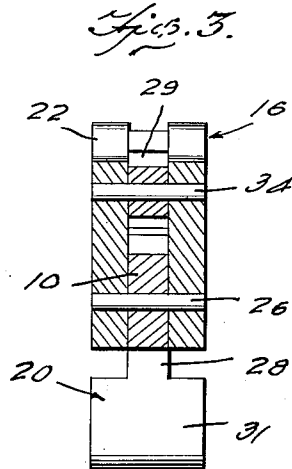
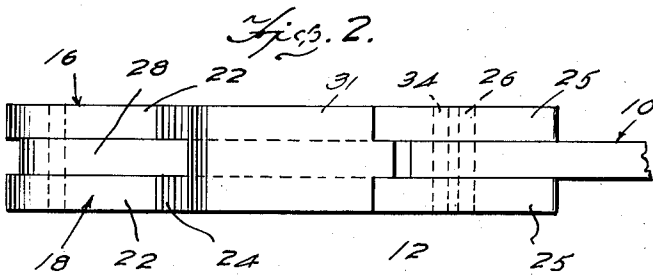
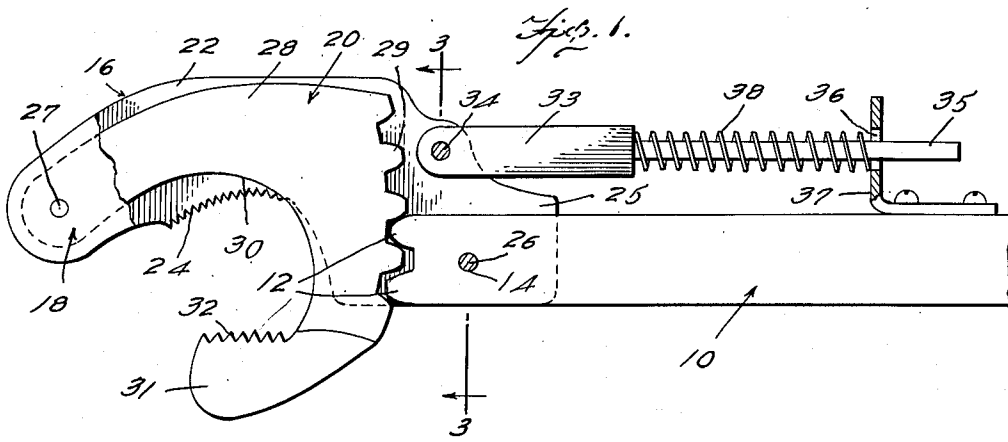
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C. D. DANIELS

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PIVOTED JAW WRENCH

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INVENTOR.
Charles D. Daniels
BY
Wilfred Lawson
ATTORNEY

UNITED STATES PATENT OFFICE

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PIVOTED JAW WRENCH

Charles D. Daniels, Mountainair, N. Mex.

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3 Claims. (Cl. 81—91)

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This invention relates generally to the class of tools and is directed particularly to improvements in wrenches.

An object of the present invention is to provide an improved wrench designed for use on pipes, nuts, studs or other objects, whether round or polygonal contour, wherein the object is either completely encircled or encircled through more than half of its circumference by the wrench jaws and the wrench structure is so designed that the gripping action of the jaws increases with the pressure applied to the wrench handle.

Another object of the invention is to provide a wrench of the above described character which is designed in a novel manner whereby a slight movement in the opposite direction of that necessary for closing the jaws to grip the object, will result in the immediate release of the object, as a result of which the wrench can be conveniently handled with one hand.

A further object of the invention is to provide in a wrench structure of the character stated, a novel spring coupling between the head of the wrench or one jaw element thereof, and the wrench handle to which said one jaw element is pivotally attached, whereby the wrench will automatically close itself around the object, after the jaws have been separated to receive the object.

Still another object of the invention is to provide an improved wrench structure which eliminates the use of dogs or other small or weak working parts which may be broken under strain and in which there is an entire absence of intricate ratchet mechanism such as is commonly employed in many wrenches.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawings:

Figure 1 illustrates, partly in side elevation and partly in section, a wrench constructed in accordance with one embodiment of the present invention;

Figure 2 is a view of the underside of the wrench of Figure 1;

Figure 3 is a transverse section taken substantially on the line 3—3 of Figure 1;

Figure 4 is a view partly in side elevation and partly in section of another embodiment of the wrench;

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Figure 5 is a view of the underside of the structure shown in Figure 4.

Referring now more particularly to the drawing, numeral 10 generally designates a handle which may be in the form of a bar of suitable cross sectional form and of any desired length, which has its forward end provided with a pair of forwardly directed integral teeth 12 and adjacent to the toothed end the handle is provided with a transverse pivot pin aperture 14.

Numeral 16 generally designates the wrench head which comprises a relatively fixed jaw generally designated 18 and a movable jaw which is generally designated 20.

The jaw 18 which is defined as the relatively fixed jaw for purposes of identification only in view of the fact that it is pivotally mounted on the forward end of the handle 10, comprises two spaced arcuate plates 22 each of which has a recessed, toothed jaw face 24. Each plate 22 has a rear shank portion 25, and these shank portions are positioned at opposite sides of the forward end of the handle 10 and are suitably apertured to receive a pivot bolt or pin 26 which passes through the handle opening 14.

The forward curved ends of the plates 22 are suitably transversely apertured to receive a forward pivot pin 27.

The handle actuated or movable jaw 20 comprises a long arcuate flat plate 28 which has an end disposed between the forward ends of the plates 22 and provided with a suitable opening to receive the forward pivot pin 27 whereby the jaw 20 has swinging movement between the plates 22 of the fixed jaw.

At its rear end the swinging jaw plate 28 has a rearwardly directed edge which is provided with a number of rack teeth 29 which are opposed by and adapted to be engaged with the handle teeth 12.

The jaw plate has a concave edge 30 which generally coincides with the toothed concave jaw edges 24 of the plates 22; and integral with the swinging jaw plate 28, at the opposite end of the concave edge portion from the end mounted on the pin 27, is the jaw member 31 which has a toothed face 32. This member 31 is of a width equalling the overall width of the fixed jaw 18 as shown in the under or bottom view of the wrench forming Figure 2, and the toothed jaw face opposes the arcuate toothed faces 24 of the plates 22.

The shank portions 25 of the jaw plates 22 are connected above the pivoted end of the handle 10, with a push rod 33 by means of a pin 34. As shown the forward end of the rod 33 is positioned

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between the shanks 25 and is spaced from the handle 10. The back end of the rod 33 is continued by a reduced rod extension 35 which passes through an aperture 36 formed in an upstanding bracket 37 which is secured to the top of the handle 10. Surrounding this reduced rod extension 35 and interposed between the bracket 37 and the forward part of the rod 33 is a coil spring 38 which is normally under some tension and which is additionally compressed or tensioned by the swinging of the handle 10 in a counterclockwise direction as it is viewed in Figure 1.

By swinging the handle 10 in counterclockwise direction the teeth 12 can be freed from the rack teeth 29 so that the movable or shiftable jaw 20 can be roughly set to the proper position with respect to the fixed jaw, to receive a pipe or other object. When the handle is so swung to disengage the teeth between the handle and the movable jaw, the spring 38 is placed under further tension and thus when the wrench head is released the entire head will be oscillated on the pin 26 by the tension spring 38 and the wrench will automatically close on the inserted object. This automatic movement of the head is counterclockwise with respect to the handle and consequently when pull is applied to the handle in a clockwise direction the meshed teeth 12 and 29 will cause the jaws to further grip the object.

The form of the wrench illustrated in Figures 1 to 3 is an open jaw type of wrench. In the form illustrated in Figures 4 and 5 a closed jaw wrench is illustrated wherein the wrench head which is generally designated 40 comprises a fixed jaw 41 consisting of two plates 42 similar to the plates 22, which are in spaced parallel relation and each of which has an arcuate toothed jaw face 43.

The rear ends of the jaw plates 42 have shanks 44 between which is pivotally engaged on a transverse pivot pin 45, a forward end of a handle which is generally designated 46.

The shanks are also connected by a transverse pin 47 with which is connected a spring operated push rod 48 having a reduced terminal extension 49 which passes through an upstanding bracket 50 secured to the handle as shown. Between the bracket 50 and the larger forward end 48 of the rod is a spring 51 which surrounds the rod extension 49 and constantly exerts a forward thrust on the jaw 41 to oscillate it relatively to the handle on the pin 45.

The forward end of the handle has integral teeth 52 for the purpose about to be described.

Numeral 53 generally designates a moving or swinging jaw which is in the form of an arcuate or substantially U-shaped body, one end of which is disposed between the forward ends of the plates 42 and pivotally connected thereto by a transverse pin 54 which passes through the two jaws. The opposite end portion of the movable jaw unit has its rear edge provided with rack teeth 55 which oppose the teeth 52 and are engaged thereby in the operation of the wrench structure. The inner or concave face of the movable jaw 53 is toothed and forms a gripping face 56 which opposes the concave gripping jaw faces 43 of the handle attached or fixed jaw.

As shown, the middle portion of the movable jaw 53 is, like the jaw 31, of a width equalling the overall width of the wrench head so that the movable jaw presents a relatively wide body gripping surface.

It is believed that it will be readily apparent

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that the operation of the closed jaw type of wrench shown in Figure 4 is the same as the operation of the open jaw type of Figure 1, in that the jaw faces 43 and 56 are separated by swinging the handle 46 counterclockwise on the pivot 45, which action will turn the teeth 52 away from and out of engagement with the teeth 55, it being understood, of course, that in this operation as well as in the operation of the open jaw type of wrench, the wrench head will be held by one hand, while the handle is thus turned on the pivot 45. This action will compress the spring 51 as above described in connection with the first wrench and after the object which is to be gripped is placed between the jaws, the release of the wrench head, while the handle is still held, will permit the spring 51 to oscillate the head in a direction to bring the teeth 52 and 55 back together and close the jaws on the gripped object.

In the present invention, in both of its forms, it will be readily seen that the jaws are self setting in that when they are separated to receive an object, the control spring will be compressed and after the object is in place and the head of the wrench is released the spring will turn the head on the handle so as to effect the closing of the jaws on the inserted object.

I claim:

1. A wrench comprising an elongate handle; a head including two arcuate plate members in spaced parallel relation and having terminal shanks at one end, said handle having one end between said shanks, a pivot pin passing through said shanks and the interposed handle end; said handle end having longitudinally extending teeth, a pivoted jaw plate of arcuate form and having an end pivoted between the other ends of the first plate members, the second mentioned jaw plate having a long end edge extending between the plate members and across the toothed end of said handle and provided with teeth engaged by the handle teeth, said end edge continuing in a portion lying in spaced relation with the concave portions of the two arcuate plate members and providing a jaw face opposing said concave edges; a bracket carried on the handle, a bar pivotally attached at one end to said shanks and having its other end slidably supported by said bracket; and a spring surrounding the bar and attached at one end thereto and pressing at its other end against said bracket.

2. A wrench of the character stated in claim 1, wherein said pivoted arcuate jaw plate is of substantially U-form, the concave central portion of the said arcuate jaw plate being in opposed relation with the concave edges of the plate members to form said jaw plate for coaction with said plate members.

3. A wrench according to claim 1, wherein said pivoted arcuate jaw plate is of substantially U-form with one side shorter than the other, said shorter side constituting the said continuing portion and the longer side lying between the plate members.

CHARLES D. DANIELS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
78,176	Barnes	May 26, 1868
736,372	Fasenneyer	Aug. 18, 1903
824,082	Reynolds	June 19, 1906
1,498,521	Holman	June 17, 1924