

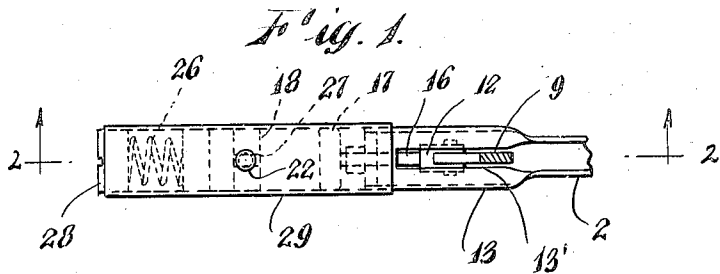
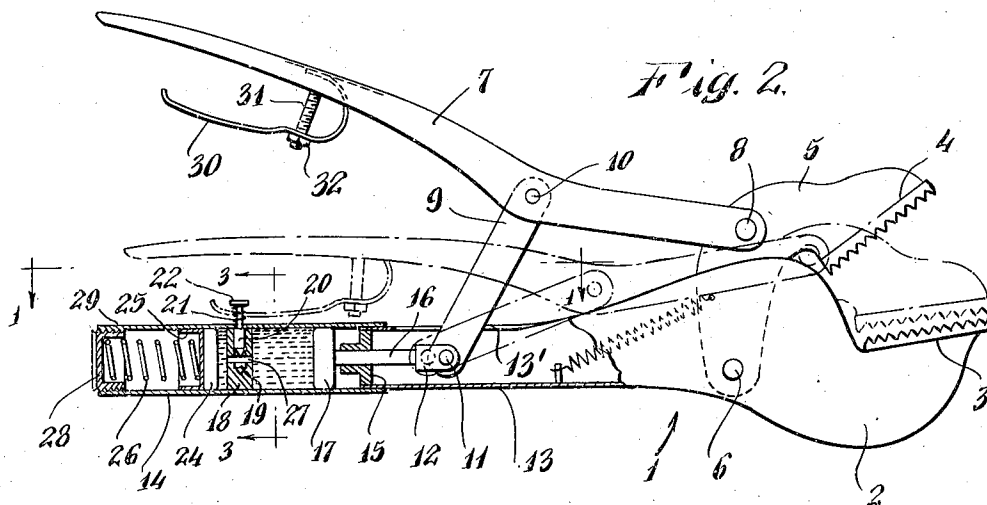
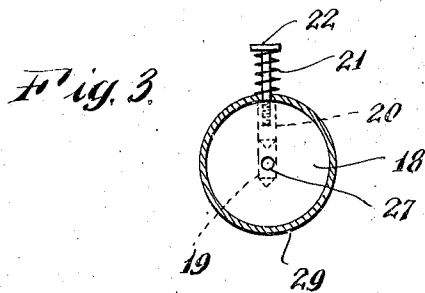
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TOGGLE ACTUATED WRENCH WITH HYDRAULIC CONTROL

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TOGGLE ACTUATED WRENCH WITH
HYDRAULIC CONTROL

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3 Claims. (Cl. 81-84)

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The present invention relates to improvements in vise-grip or toggle wrenches and, more specifically, to a new and improved automatic hydraulic toggle wrench.

It is known to construct wrenches of this type in such a manner that the wrench remains locked to the work with hands removed from the wrench. This feature of the wrench is important for holding templates, blanks, and the like, and it offers the advantage of reducing the cost of labor by eliminating the necessity of a second man as helper for many operations. The hitherto known wrenches of this type had to be adjusted for locking the work with hands removed by means of manipulating a screw or the like.

One object of the present invention is the provision of a device of the character described which is locked automatically, by means of a valve-controlled fluid pump, so that no manipulation of a screw or the like will be necessary.

Another object of the present invention is the provision of a device of the character described which makes it possible to obtain a variation of the pressure of the gripping jaws on the work, so that this tool can be used for different types of material and work.

Still another object of the present invention is the provision of a device of the character described which is comparatively light in weight, and free from protruding parts such as clumsy adjustment screws or the like, so that this new and improved tool can be handled easily and conveniently.

A further object of the present invention is the provision of a device of the character described which is simple in construction and inexpensive to manufacture, so that it can be sold at a very reasonable price, but which is sturdy, durable, and well adapted to withstand the rough usage to which devices of this type frequently are subjected.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawings the preferred forms of the invention have been shown.

In said drawings:

Figure 1 is a fractional sectional view on the

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line 1-1 of Figure 2 of a preferred embodiment of the present invention;

Figure 2 is a side elevation, fractionally in longitudinal section on the line 2-2 of Figure 1;

and

Figure 3 is an enlarged cross-sectional view on the line 3-3 of Figure 2.

Similar reference characters refer to similar parts throughout the several views.

In the drawing (Fig. 2) the numeral 1 denotes an entire wrench made in accordance with the present invention, having gripping jaws 3 and 4 which are secured to, or formed as units with, the members 2 and 5. The latter are pivoted to one another at 6, and a handle 7 is pivoted to the member 5 at 8. The member 2 is formed as a unit with the handle 13, and a link 9 is pivoted to the other handle 7 at 10 and is extended through a slot 13' into the handle 13. The rear portion of the handle 13 is formed preferably by a longitudinal cylinder 29, which is secured to the handle 13 by means of welding or the like, or formed as a unit therewith, and which is subdivided by a wall 18 into a cylindrical receptacle 14 and a pump cylinder. In the latter is slidable a piston 17, whose piston rod 16 is extended through a stuffing box 15 and provided with a cross-head 12 that is pivoted to the link 9 at 11.

The wall 18 is provided with a perforation 27 and with a radial bore 19 which meets the perforation 27, and in which is slidable a valve 20. The latter is held normally by a spring 21 in such a position that the perforation 27 is open, as may be seen in Fig. 2, the spring 21 being interposed between the head 22 and the outer, upper side of the cylinder 29.

Within the receptacle 14 there is slidable a piston 24 and cup 25, and a spring 26 is interposed between these slidable parts and the head 28 of the cylindrical receptacle 29.

The handle 7 is provided with a leaf spring 30 and with a threaded bolt 31, which is extended through the spring 30 and is provided with an adjustment nut 32. A fluid, such as oil or the like, is contained in the cylinder 29 between the pistons 17 and 24.

When the handles 7 and 13 are spread apart, as shown in full lines in Fig. 2, the valve 20 is being held open by the spring 21. While the handles are being moved from the position shown in full lines to that shown in dash-and-dotted lines in Figure 2, the piston 17 is moved by the rod 16 and the link 9 toward the wall 18, and the fluid passes through the perforation 27 into the receptacle 14 thereby pushing the piston 24 to-

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ward the head 28. When the handle 7 has reached the position shown in dash-and-dotted lines in Fig. 2, the spring 30 will depress the valve 20, so that no fluid can pass through the perforation 27. According to the adjustment of the spring 30, by means of the parts 31 and 32, the spring 30 will depress the valve 20 sooner or later, so that the pressure of the jaws 3 and 4 on the work can be varied by means of this adjustment of the spring 30. Once the perforation 27 is closed by the valve 20, the parts 5, 7, 9, 16 and 17 cannot move any longer, so that the jaws 3 and 4 are locked to the work. In order to release the work, one lifts the spring 30, so that the valve 20 will open the perforation 27; then the spring 26 will press the piston 24 toward the wall 18 and the fluid will pass through the perforation 27, so that the piston 17 will move away from the wall 18, thus causing an opening of the jaws 3 and 4.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination, in a wrench which consists of a pair of handles and two gripping jaws working on a pivot and being adapted to be closed upon pressing the handles together, of a piston pump mounted within one of said handles and having its piston linked to the other handle, with a normally open valve controlling the passage of the fluid from said pump to a cylindrical receptacle, and an adjustable leaf spring being provided at said last mentioned handle and adapted for closing the valve when said handles have been moved relative to one another into a position in which the gripping jaws are closed, a spring biased piston being contained within said cylindrical receptacle for forcing the fluid back into the pump after said valve has been re-opened.

2. In a wrench which consists of a pair of handles and two gripping jaws working on a pivot and being adapted to be closed upon press-

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ing the handles together, a longitudinal cylinder being secured to and formed as the rear portion of one of said handles and being subdivided by a perforated wall into a pump cylinder portion and a cylindrical receptacle, a pump piston movable within the pump cylinder portion being linked to the other handle, a valve extended into said longitudinal cylinder and into said wall being normally open and adapted for closing temporarily the perforation in said wall, an adjustable leaf spring being provided at said last mentioned handle and adapted for closing the valve when said handles have been moved relative to one another into a position in which the gripping jaws are closed, and a spring biased piston being contained within said cylindrical receptacle for forcing the fluid back into the pump after said valve has been re-opened.

3. In a wrench which consists of a pair of handles and two gripping jaws working on a pivot and being adapted to be closed upon pressing the handles together, a longitudinal cylinder being secured to and formed as the rear portion of one of said handles and being subdivided into a pump cylinder portion and a cylindrical receptacle by means of a wall which is provided with a perforation and a radial bore that meets said perforation, a piston movable within the pump cylinder portion being linked to the other handle, a valve extended into said longitudinal cylinder and slidable in the radial bore of said wall being normally held by resilient means in such a position that it leaves open the perforation in said wall, adjustable resilient means being provided on the last mentioned handle and adapted for pressing said valve into the perforation of said wall when said handles have been moved relative to one another into a position in which the gripping jaws are closed, a piston being slidable within said cylindrical receptacle, and a spring being interposed between said last mentioned piston and the outer extremity of the receptacle, said spring tending to press the piston towards said wall.

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