Aug. 28, 1956 H. ST. PIERRE 2,760,395

WRENCH HAVING YIELDABLY BIASED PIVOTAL OUTER JAW

Filed March 25, 1954

FIG. 1

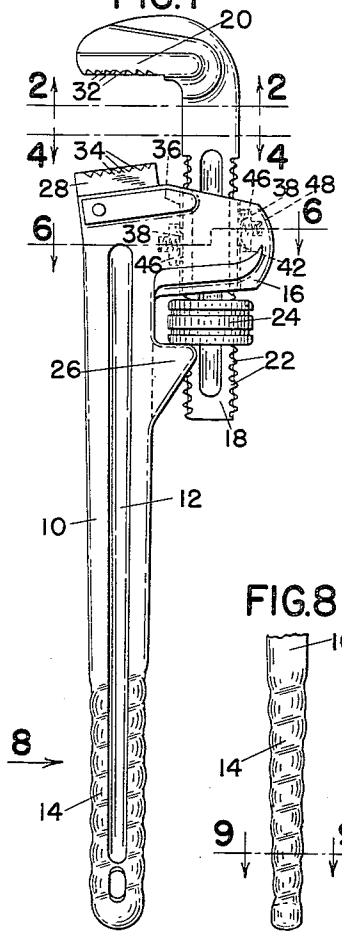


FIG. 8

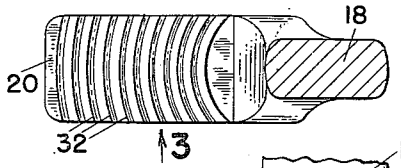


FIG. 2

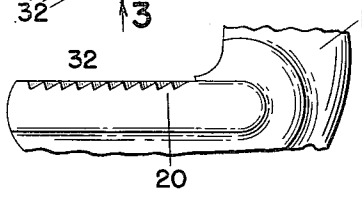


FIG. 3

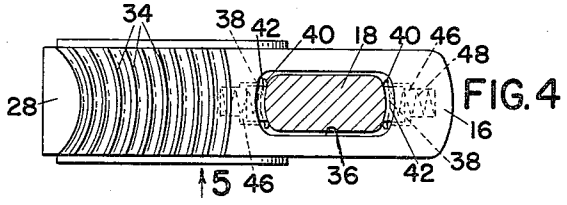


FIG. 4

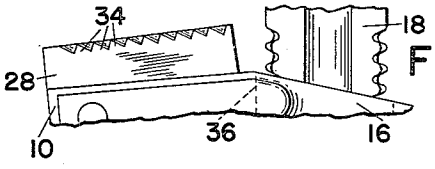


FIG. 5

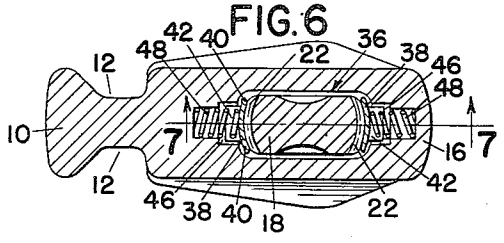


FIG. 6

FIG. 9

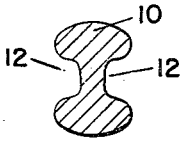


FIG. 10

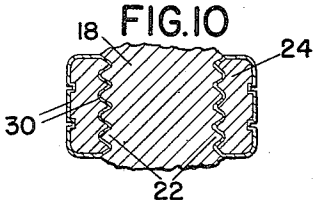
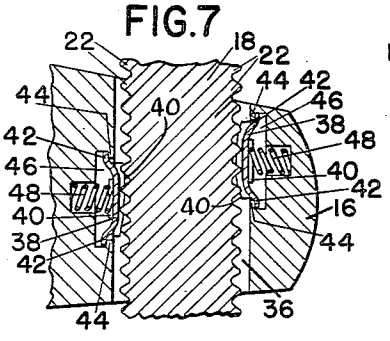


FIG. 7



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WRENCH HAVING YIELDABLY BIASED PIVOTAL OUTER JAW

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2 Claims. (Cl. 81—101)

This invention relates to a new and improved wrench, being particularly adaptable to Stillson or pipe wrenches although the inventive features may be utilized in other wrenches of the type having relatively rectilinearly movable jaws.

The principal object of the invention resides in the provision of a new and improved wrench having a relatively fixed jaw and a movable pivotally mounted jaw wherein new and improved spring means is provided for maintaining the movable jaw in an intermediate inactive position, said spring means being located at each side of the shank of the movable jaw in a projection on the fixed jaw or the handle therefor, said spring means being located in offset relation with respect to each other for the purpose of providing for a slightly tilted intermediate inactive position of the movable jaw such that it can be moved away from the fixed jaw to a greater extent than possible motion toward the fixed jaw for the purpose of increasing the grip of the jaws on a member held between them.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which:

Fig. 1 is a view in elevation of a wrench according to the invention;

Fig. 2 is an enlarged section on line 2—2 of Fig. 1;

Fig. 3 is an edge view of the jaw shown in Fig. 2, looking in the direction of arrow 3;

Fig. 4 is an enlarged section on line 4—4 of Fig. 1;

Fig. 5 is an edge view thereof, looking in the direction of arrow 5 in Fig. 4;

Fig. 6 is an enlarged section on line 6—6 of Fig. 1;

Fig. 7 is a section on line 7—7 of Fig. 6;

Fig. 8 is an edge view of the spiral handle, looking in the direction of arrow 8 in Fig. 1;

Fig. 9 is a section on line 9—9 of Fig. 8; and

Fig. 10 is a section through the nut shown in Fig. 1 and the shank in mesh therewith.

The present invention has been illustrated as applied to a pipe or Stillson wrench but the invention may also be applied to other types of wrenches and particularly those which include a handle with a fixed jaw, and a shank movable in parallel relation to the handle and having a jaw for movement to and from the fixed jaw. In the present case, the wrench is provided with an elongated tapered handle 10 provided with elongated tapered grooves 12 which provide for sufficient strength in the handle with a lesser amount of material. At its smaller free end, the handle 10 is formed on a spiral as is clearly shown at 14, this spiral formation providing for a greatly improved grip on the part of the operator. The cross sectional shape of the handle is generally oval as seen in Fig. 9 and the spiral formation is interrupted by the longitudinally extending grooves 12 as clearly shown in Fig. 1.

The handle 10 is provided in this case with an integral projection 16. This projection may of course take the form of a separate attached frame if desired, as well

known in the art. In any event, the projection 16 is apertured as usual, and receives in loose sliding engagement a movable shank 18 having a jaw 20. This shank is provided with threads 22 at either side thereof for engagement with internal threads of a relatively large nut 24. The nut 24 is held against axial movement between the projection 16 and a spur 26, and upon rotation of nut 24, the shank 18 will be rectilinearly translated so as to bring the jaw 22 toward and from a jaw 28 which is mounted in fixed relation to the handle 10 as shown.

The nut 24 is thickly plated with a soft metal generally indicated at 30. This may be brass or similar material and it provides for easier and quicker rotation of the nut on the shank, so that the adjustment of the jaws may be made more quickly.

Referring now to Figs. 2 and 3, it will be seen that the jaw 20 is provided at its gripping surface with a series of gripping teeth 32 cut on the arcs of circles, the centers of which are located to the right in Fig. 2. Each of the teeth 32 therefore forms an arch which is concave in a direction facing the shank 18.

Referring to Figs. 4 and 5, it is seen that the fixed jaw 28 is provided with similar teeth 34 formed on the arcs of circles, the centers of which are to the left in Fig. 4, so that the individual teeth present concave gripping edges extending in the direction shown, i. e., oppositely to the teeth of Fig. 2.

When these two jaws grip between them some object and the handle of the wrench is moved in a clockwise direction in Fig. 1, which is the normal motion for tightening one object relative to another, it will be seen that all of the teeth 32 and 34 present their concave edges to the object gripped and therefore act in the manner of arches or the like so that each tooth is stronger than a straight tooth both because it is longer and because it presents an arched shape. Furthermore, the object gripped will be gripped by a plurality of teeth at different points along their edges, whereas in the case of straight teeth, one tooth alone or perhaps two teeth would grip an object along the length of each such tooth. It will therefore be seen that the present spiral or arc-shaped teeth are much stronger and grip better than teeth of the prior art.

The aperture in the projection 16 is indicated at 36 and it is made sufficiently large so that the shank 18 is only loosely contained therein as is clearly indicated in Fig. 7. The less the teeth 22 are interfered with during rectilinear movement of shank 18, the smoother and easier the nut 24 will operate. The shank is held in a pivotal relation in the aperture 36 and in the present case, spring devices are provided, one at each side of the shank, so as to yieldably resist rotational motion of the shank in either a clockwise or counterclockwise direction in Fig. 1.

Each spring device comprises a shoe or the like 38 which is provided with a transverse section that is made concave (see Figs. 4 and 6) in order to conform to the shape of the teeth on the shank 18. The shoes are also concave in the direction of their lengths. In this way there is little or no resistance to the motion of the shank due to the shoes 38. The longitudinal edges of these shoes may be turned out slightly as at 40 in order to provide smooth non-interfering edges, and the ends of the shoes are bent reversely (see Fig. 7) at 42.

The bent-away ends form feet at the ends of the shoes for engagement with undercut shoulders 44 which hold the shoes loosely in openings 46, there being one such opening and one such shoe at each side of the shank as clearly shown. The shoes 38 are yieldingly pressed toward the aperture 36 by means of coil springs 48, and it will be seen that this construction provides for holding

the shank yieldably in an intermediate non-operating central position without interfering with the rectilinear motion of tthe shank under influence of the nut, so that a very smooth action is obtained while still providing an improved holding means for the shank, allowing for pivotal motion thereof in either direction in Fig. 1.

It is preferred that the spring device at the side of the shank **18** away from the jaws shall be advanced or offset forwardly with relation to the other spring device, so that the shank is actually yieldingly held in a slightly canted relation in a counter-clockwise direction. The result of this construction is that the jaw **20** and shank **18** may be pressed away from jaw **28**, without of course rotating nut **24**, to a greater degree than any possible motion in the opposite direction, and this is advantageous in grasping or gripping an object between the jaws.

It will be seen that this invention provides for an extremely smoothly adjusted wrench which acts to grip with greater force and is easier to apply to an object to be gripped. The jaws themselves present better gripping surfaces, the movable jaw is moved easier and smoother, and the handle of the wrench provides for a better gripping by the user and at the same time presents a wrench of relatively light weight as compared with the strength and gripping action thereof.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A wrench comprising a frame having a fixed jaw, an apertured projection associated with the frame, a pair of recesses within the projection and intersecting the aperture at opposite sides thereof, a movable jaw, a shank therefor, said shank being located in the aperture, a spring device in each recess bearing on the shank at opposite sides thereof and yieldably holding the same

in an intermediate inactive pivotal position relative to the frame, each spring device comprising a shoe having a concaved shape with the ends thereof bent out and received in its recess in the projection, undercut shoulders in each recess receiving and holding the bent out ends, and a spring urging the shoe outwardly of its recess to engage the shank.

2. A wrench comprising a frame having a fixed jaw, an apertured projection associated with the frame, a pair of recesses within the projection and intersecting the aperture at opposite sides thereof, a movable jaw, a shank thereon, said shank being located in the aperture, a spring device in each recess bearing on the shank at opposite sides thereof and yieldably holding the same in an intermediate inactive pivotal position relative to the frame, each spring device comprising a shoe having a concave section to fit the shank smoothly, means loosely holding each shoe in its recess, and a spring urging each shoe into contact with the shank.

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