This invention relates to a screw wrench and refers more particularly to a screw wrench having a body carrying an immovable jaw and serving as a guide for a movable jaw cooperating with the immovable jaw and guided in the body by means of a lever. An object of the present invention is the provision of an adjustable screw wrench of comparatively simple and conveniently operable structure.

Another object is the provision of a screw wrench which can be conveniently and easily utilized for screw heads of several different sizes.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention it was found desirable to provide an adjustable screw wrench the movable member of which is swingably, elastically supported. Preferably the movable jaw is provided with a guide which is engaged by springs at its opposite ends in the directions of its movement. In accordance with a modified construction the lever, instead of the jaw, is resiliently engaged in its two opposed directions of rotation. As a result of this opposed, double, resilient pressure the adjustable jaw automatically assumes an intermediate position so that the wrench can easily engage work pieces having a smaller length, whereby the work pieces are firmly held as a result of the actuation of the lever. It is merely necessary to move back the adjustable jaw against the pressure of a spring to enable the wrench to grasp a work piece having a larger head.

The present invention is also concerned with screw wrenches the operative opening of which is adjustable by means of a worm rotatably mounted in the wrench body and engaging the teeth of the movable jaw. In accordance with the invention the worm is engaged by springs at its opposite front surfaces and can be shifted axially by means of a lever upon an axle or a shaft mounted in the wrench body. The lever at that time engages the worm by means of a sleeve slidably mounted upon the axle or shaft. Due to the double spring engagement of the worm this wrench has again the advantage that it can be used for a plurality of head sizes of work pieces, due to the possibility of adjustment which is produced by the worm.

According to another embodiment of the present invention a stop-lever which is engaged by springs on two sides and which is swingingly supported in one of the jaws, engages teeth provided in the guide of the other jaw. This connection of the two jaws makes it possible to keep the operative width required for the operation of the work piece.

A movable pivot carrier is mounted in the wrench body and is influenced by spring action in such a way that when the pressure exerted upon the hand-operated lever is released the wrench assumes automatically the same operative opening as which it had prior to the jaw-engaging operation. This adjustment of the operative opening by means of stops is always so extensive that sufficient play is provided between the jaws and the surfaces of the work piece. If the hand-operated lever is rotated in the direction opposite that in which the wrench is tensioned then the jaws open resiliently by the edges of the work piece or the screw head. This opening of the jaws facilitates the subsequent grasping of the work piece by the wrench to a considerable extent since the wrench remains upon the work piece (assuming, by way of example, that the work piece has been turned by the wrench to an angle of 60° and that the wrench must be turned back to the extent of the same angle of 60° in order to again grasp the work piece). When pressure upon the jaws is released, the initially set operative opening is again reestablished. The distance of the stops at the guide preferably corresponds to the usual standard sizes of work pieces, for example, the screw heads or nuts, including the necessary play.

The invention will appear more clearly from the following detailed description when taken in connection with accompanying drawings, showing, by way of example, preferred embodiments of the inventive idea.

In the drawings:

Figure 1 shows in section, and partly in side elevation, a wrench, the parts of the wrench being shown in their intermediate positions of rest.

Figure 2 is similar to Figure 1 and shows the parts in a different position.

Figure 3 is similar to Figure 2 and shows the parts in yet another position.

Throughout the specification and drawings the same or corresponding parts have been indicated by the same reference numerals.

The wrench shown in the drawings includes an axle, or shaft, 11 which is rotatably mounted in the body 1. A worm 12 is rotatably mounted upon the shaft 11 and may be shifted longitudinally thereon. The worm 12 meshes with the teeth 13 of the guide 3' connected with the movable jaw 3. The shaft 11 at one end is screwed into screw threads 14 provided in the wrench body 1. The opposite end of the shaft 11 engages a nut 15 screwed into the wrench body 1. A slidable sleeve 16 is mounted upon the shaft 11 close to the worm 12. The sleeve 16 is provided with a recess engaged by a tooth, or projection, 17 forming part of the hand-operated lever 8. The lever 8 is rotatably mounted upon a pivot 9 carried by the body 1.

It is apparent that the positions of the inter-engaging members 16 and 17 can be reversed.

The worm 12 and the sleeve 16 which is located next to the worm 12 are situated between helical pressure springs 5 and 6 which are also mounted upon the shaft 11. One end of the spring 6 engages the worm 12 while its other end engages the wall of the recess formed in the body 1. One end of the spring 5 engages the sleeve 16 while its other end engages the screw 15. Thus the two springs 5 and 6 hold the worm 12, the sleeve 16 and consequently the lever 8 in the swinging, elastically supported position of rest illustrated in Figure 1. By rotating the worm 12 which is accessible through the recess 18 of the body 1, the movable jaw 3 can be shifted and can be set to correspond to a specific opening or to a specific size of the nut 10 which is being actuated. This adjustment of the jaw 3 need be carried out only roughly since a small play remains between the jaws 2 and 3 and the nut 10, as shown in Figure 1. This play facilitates the repeated engagement of the wrench with the nut or with the other one of the members clamping the nut 10. If the hand lever 8 must be swung slightly clockwise (looking in the direction of Figure 2), whereby the movable members 16 and 3 move to the right and the spring 6 is somewhat compressed. In this clasped position the wrench can be used to turn the nut 10. If now the operator releases the lever 8, the spring 6 will move the above-mentioned members back to their positions shown in Figure 1, so that the wrench can be con-
veniently withdrawn to the side from the nut 10 and then placed in a new position over the nut 10.

It should be noted, however, that this repeated side movement of the wrench relatively to the nut 10 is not necessary since when the hand lever 8, and consequently the wrench, are turned counter-clockwise (looking in the direction of Figure 3), then the movable members 12, 16 and 3 will move to the left and the spring 5 will be compressed; then the operative opening will be so great that opposed corners of the nut 10 will be in engagement with the jaws 2 and 3. If now the wrench is further turned counter-clockwise about the nut 10 then the pressure of the spring 5 will move the above-mentioned parts from the position shown in Figure 3 back to the position shown in Figure 1. When the device is then turned clockwise the nut 10 is again clasped so that its rotation can be continued.

The side play, that is the extent to which the worm 12 and the sleeve 16 can be shifted axially within the wrench body 1 can be so selected that, for example, three consecutive standard sizes of work pieces 10 can be engaged by only one wrench opening which is set through the rotation of the worm 12.

What is claimed is:

1. An adjustable slidable side jaw wrench, comprising a wrench body, an immovable jaw firmly connected with said body, a movable jaw located opposite said immovable jaw, a worm, a shaft rotatably supporting said worm in said body, opposed coil springs for resiliently supporting said worm, a handle pivoted in said body, a sleeve engaging said worm, means connecting said handle with said sleeve for shifting said worm upon said shaft, and means connected with said immovable jaw and meshing with said worm.

2. An adjustable slidable side jaw wrench, comprising a wrench body, an immovable jaw firmly connected with said body, a movable jaw located opposite said immovable jaw, a worm, a shaft rotatably supporting said worm in said body, opposed coil springs for resiliently supporting said worm, a handle pivoted in said body, a sleeve slidably mounted upon said shaft and engaging said handle, and means connected with said movable jaw and meshing with said worm.

3. An adjustable slidable side jaw wrench, comprising a wrench body, an immovable jaw firmly connected with said body, a movable jaw located opposite said immovable jaw, a worm, a shaft rotatably supporting said worm in said body, a handle pivoted in said body, a sleeve slidably mounted upon said shaft and engaging said handle, a coil spring located in said body and engaging said worm, another coil spring located in said body and engaging said sleeve, and means connected with said movable jaw and meshing with said worm.

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