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A. HUFSCMID
 RACK-AND-CAM OPERATED LOCKING MEANS FOR THE
 SLIDABLE JAW OF A SLIDABLE INNER JAW WRENCH
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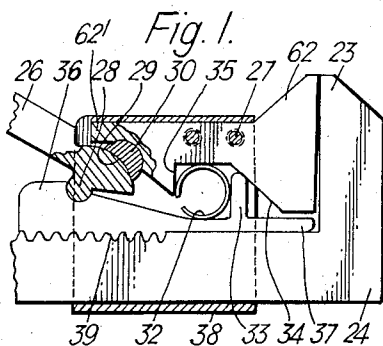


Fig. 2.

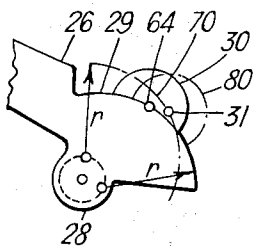


Fig. 3.

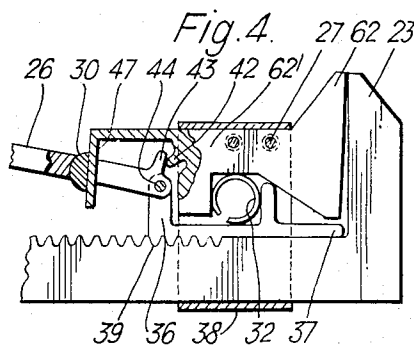


Fig. 5.

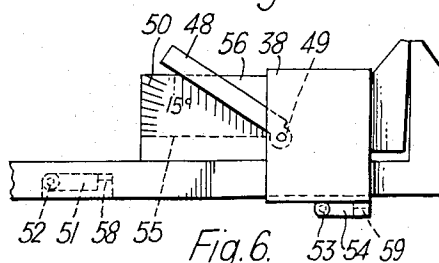


Fig. 6.

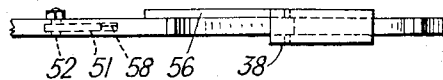


Fig. 7.

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RACK-AND-CAM OPERATED LOCKING MEANS FOR THE SLIDABLE JAW OF A SLIDABLE INNER JAW WRENCH

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4 Claims. (Cl. 81-143)

The present invention relates to a slidable inner jaw wrench. The wrench consists of a bar which is rigidly connected to a jaw and on which are displaceably mounted a sleeve carrying a second jaw and also a support adapted to be secured on the bar. In addition, a lever is provided for the mutual displacement of the sleeve and support. The lever is subjected in each position to the self-locking action by a slide block of substantially crescent-shaped or semi-circular cross-section which is mounted in or on the sleeve.

A number of embodiments of the subject of the invention are shown by way of example in the accompanying drawing, wherein:

Figs. 1 to 3 show the first embodiment of the slidable inner jaw wrench.

Fig. 1 showing the slidable inner jaw wrench in part-sectional elevation,

Fig. 2 being a plan view thereof, and

Fig. 3 showing roller parts to a larger scale.

Figs. 4 and 5 show the second embodiment of the slidable inner jaw wrench.

Fig. 4 showing the wrench in part-sectional elevation while

Fig. 5 is a plan view thereof partly in section..

Figs. 6 and 7 show the third embodiment of the slidable inner jaw wrench.

Fig. 6 being an elevation, and

Fig. 7 a plan view.

Fig. 1 shows a bar 24 formed with teeth 39, the said bar carrying a fixed jaw 23 and a movable and adjustable jaw 62 which is riveted by pins 27 to a sleeve 38. The lower part of the sleeve engages around the bar 24. The bar 24 also carries a scale, not shown. The jaw 62 has an extension 62' containing a socket for a crescent-shaped slide block 30 and a recess 35 with a slope 34 for the mounting of the spring 32, which spring forces a toothed rack support 36 into the teeth 39. Provided in the support 36, which engages with its teeth 39 in Fig. 1 in the teeth of the bar 24, is a socket for the base 28 of a lever 26. The base is mounted as a good fit in the socket in such manner that when the lever 26 is lifted, the support 36 then being supported by the horizontal tongue 37 resting on the bar 24. Provided on the end of the lever 26 above the base or toe 28 is a cam 29, the curved surface of which is formed as an eccentric disc on which the crescent-shaped slide block 30 rests in the manner of an eccentric ring. The centre of the slide block 30 is guided on the surface of the cam 29, while the centre of the cam fashioned as part of an eccentric disc is disposed outside the centre of the rounding of the base or toe, as shown by r in Fig. 3. The support is equipped with a vertical tongue 33 as well as with the horizontal tongue 37.

While Fig. 2 shows the plan view of the first embodiment of the wrench, Fig. 3 shows the rolling elements to a larger scale. The references 29 and 70 represent the two most extreme positions of the cam 29 with the slid-

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ing block 30 in its positions which are indicated at 30 and 80. The lifting of the sliding block 30 with the rotation of the cam is indicated by the points 31 and 64. During the shifting of the cam and sliding block, a clamping of the members concerned takes place and the sliding block assumes the positions at 30 and 80. The members guiding the cam and the sliding block into this position remain in the clamping position. This clamping zone must be distributed on both sides of the absolute clamping position.

The wrench which has just been described is handled in the following manner:

Upon the lever 26 being raised, the support 36 is lifted out of the teeth 39 of the bar 24 by the toe 28, the tongue 37 resting on the bar 24. After the jaw 62 has been brought into the required position by displacement, the lever 26 is lowered to engage the teeth. Further downward movement of the lever causes a turning of the cam 29, which moves the sliding block 30 in the direction towards the jaw 23 fixedly arranged on the bar 24, the adjustable jaw 62 being moved into the gripping position, in which it remains with a self-locking action. With the upward movement of the lever 26, the spring 32 causes a movement of the adjustable jaw 62 towards the left. The interengagement of the members is effected by surfaces with self-locking action. The interengagement and movement of surfaces assures a considerably greater effective lift to the tool than when the mechanisms simply operate with line engagement.

According to Figs. 4 and 5, the part 36 equipped with teeth 39 and the tongue 37 is provided on the bar with the fixed jaw, the said part 36 having a lever 26 pivotally mounted thereon at 44. The extension 62' of the jaw 62 is provided with a tongue 42 on which a toe 43 on the lever 26 is guided, the centre 44 being raised so that the part 36 is lifted out of the teeth 39 of the bar. The sleeve 38 of the adjustable jaw 62 is connected to the latter by rivets 27. The extension 62' of the jaw 62 comprises the slide surface 47, the slope of which relatively to the perpendicular is as much as the jaw is pushed forward during the engagement. The sliding block 30 is mounted in a socket in the lever 26, the jaw 62 being pushed forwards by means of said block in its engaging movement. The movement of the lever is so graduated that self-locking still occurs in the two most extreme positions top and bottom.

The handling of the wrench is such that the part 36 is lifted out of the teeth 39 when the lever 26 is raised. After the adjustment of the jaw 62, the lever 26 is moved downwardly, the slide surface 47 and the jaw 62 being shifted towards the right. In this case as well, the movement of the jaw is effected by surfaces sliding one upon the other, the operating parts remaining in the clamping position during their movement.

The wrench shown in Figs. 6 and 7 represents the same wrench in its function as described according to Figs. 1 and 2. The present wrench is merely to show a few additional improvements in order to indicate the extensive field of use of the wrench.

At 49, a lever 48 merely indicates the aforementioned mounting, it being possible for the moving members to be mounted in exactly the same manner as indicated in Fig. 1. The lever 48 is now merely to be used for marking an angle on metal sheets. For example, if a metal sheet is to be provided with an edge at the outer margin below 15°, the lever 48 is set at 15° and the plate placed against the lever. The angle scale 50 is indicated with the horizontal 55 on the plate arranged on the sleeve 38. Furthermore, the wrench may be used for making a circle or marking parallel lines on a metal sheet. Provided for this purpose are the sleeves 51 and 54 which are rotatable

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about 52 and 53 and which are formed with sharp points. When not in use, the sleeves 51 and 54 are disposed in recesses which are provided in the bar and in the sleeve 38 as shown in Figs. 6 and 7. In the position for use, the sleeves 51 and 54 are rotated through 90° and clamped in this position by means of a nut.

What I claim is:

1. A slidable inner jaw wrench comprising a combined handle and fixed jaw support, the handle having a rack bar along a portion of its inner edge; a slidable unit including a sleeve, a confronting slidable jaw, a toothed slidable rack catch, a pivoted lever and a spring-bias means for the rack catch; the slidable jaw having an axially aligned supporting stem portion in overlying relation to the rack catch; the stem portion having an arcuate cavity in which is seated a partially rotatable cam member; the pivoted and proximate end of the lever being provided with a mating but off-center cam surface, whereby swinging movement of the lever toward the handle will cause the engaged cam surfaces to disengage the rack catch from the rack bar and simultaneously tend to wedge the slidable jaw into firm engagement with the workpiece placed between the jaws.

2. A slidable inner jaw wrench comprising a combined handle and fixed jaw support, the handle having a rack bar along a portion of its inner edge; a slidable unit including a sleeve, a confronting slidable jaw, a toothed slidable rack catch, a pivoted lever and a spring-bias means for the rack catch; the slidable jaw having an axially aligned supporting stem portion in overlying relation to the rack catch; the stem portion having an arcuate cavity in which is seated a partially-rotatable cam member; the pivoted and proximate end of the lever being provided with a mating but off-center cam surface, whereby swinging movement of the lever toward the handle will cause the engaged cam surfaces to disengage the rack catch from the rack bar and simultaneously tend to wedge the slidable jaw into firm engagement with the workpiece placed between the jaws, the engaged cam surfaces formed so that the centre axis of the cam, placed on top of the cam of the lever, is guided on the outside surface of the cam of the lever in all positions for the purpose of having full contact of the surface in all positions.

3. A slidable inner jaw wrench comprising a combined handle and fixed jaw support, the handle having a rack

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bar along a portion of its inner edge; a slidable unit including a sleeve, a confronting slidable jaw, a toothed slidable rack catch, a pivoted lever and a spring-bias means for the rack catch; the slidable jaw having an axially aligned supporting stem portion in overlying relation to the rack catch; the stem portion having an arm for the pivot of a lever, fitted with a rotatable cam, resting on a straight surface of the extension of the slidable jaw and fitted with a toe, working together with a tongue of the extension of the slidable jaw, whereby swinging movement of the lever toward the handle will cause the engaged cam surfaces to disengage the rack catch from the rack bar and simultaneously tend to wedge the slidable jaw into firm engagement with the workpiece placed between the jaws.

4. A slidable inner jaw wrench comprising a combined handle and fixed jaw support, the handle having a pin for marking the centre of a circle on a plate and a rack bar along a portion of its inner edge; a slidable unit including a sleeve a confronting slidable jaw, a toothed slidable rack catch, a pivoted lever and a spring-bias means for the rack catch, and a plate with a scale, the sleeve fitted with a pin for marking a circle on a plate; the slidable jaw having an axially aligned supporting stem portion in overlying relation to the rack catch; the stem portion having an arcuate cavity in which is seated a partially-rotatable cam member; the pivoted and proximate end of the lever being provided with a mating but off-center cam surface, whereby swinging movement of the lever toward the handle will cause the engaged cam surfaces to disengage the rack catch from the rack bar and simultaneously tend to wedge the slidable jaw into firm engagement with the workpiece placed between the jaws.

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