Feb. 16, 1954 E. E. FLORENCE 2,669,146

ADJUSTABLE WRENCH HAVING INNER JAW ACTUATED BY PIVOTAL HANDLE

Filed April 22, 1952

Fig. 1

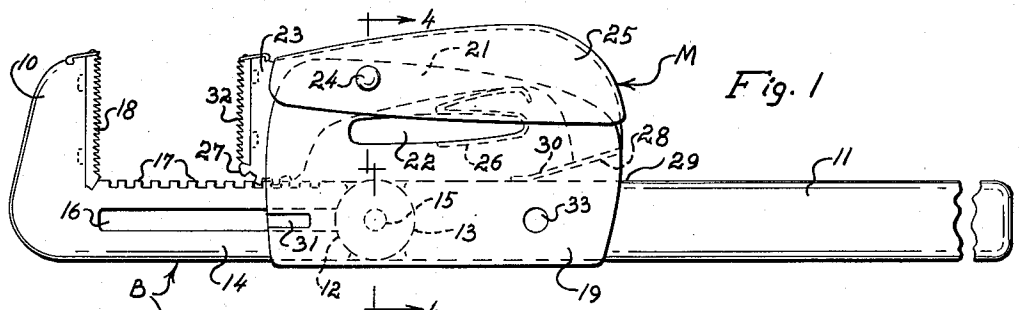


Fig. 2

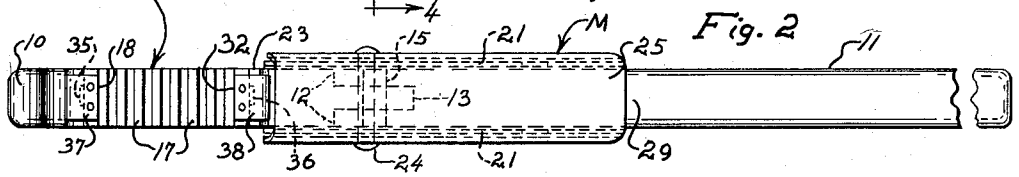


Fig. 3

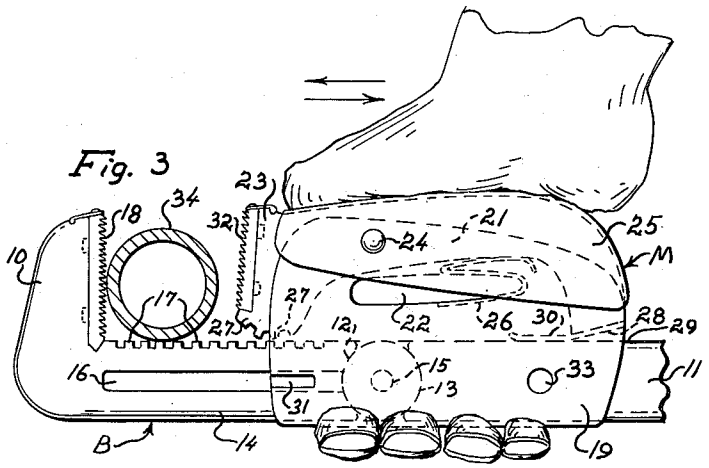


Fig. 4

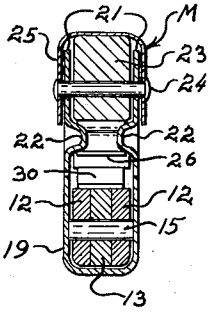


Fig. 5

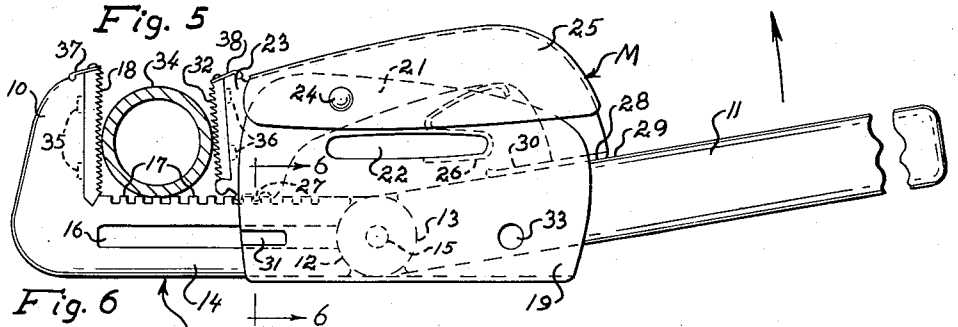
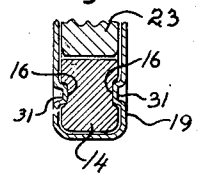


Fig. 6



INVENTOR
ESTEL E. FLORENCE

BY Williamson, Williamson, Schroeder & Adams
ATTORNEYS

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ADJUSTABLE WRENCH HAVING INNER JAW ACTUATED BY PIVOTAL HANDLE

Estel E. Florence, Buffalo, Minn.

Application April 22, 1952, Serial No. 283,597

4 Claims. (Cl. 81—91)

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This invention relates to an adjustable wrench and more particularly to that type of adjustable wrench which can be moved rapidly and directly to its newly adjusted position.

It is a principal object of the invention to provide for a quickly adjustable wrench which can be brought to the proper size for engaging and turning a piece of work by simply making a single maneuver, and which will be self-tightening if pressure is applied to the work, the more effort exerted causing the wrench to grip the work all the more firmly, the wrench itself becoming more firmly seated.

It is another object to provide for a simple adjustable wrench in which the handle is pivotally attached to the wrench for applying a wedging stress upon the wrench jaws in contact with the work and at the same time applying rotational stress upon the work.

It is still another object of the invention to furnish a wrench of the class described in which the portions adapted to be grasped manually are shielded so as to prevent pinching or crushing the hand of the operator.

It is a further object to provide for a quick adjusting and self-tightening wrench which is interchangeable from a pipe wrench to a nut type.

It is still a further object of the invention to provide for a simple and efficient wrench which is extremely versatile in its application and being at the same time quickly adjustable to meet such various applications.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a side elevation of my adjustable wrench showing the jaw mechanism in open position and in normal spring pressed relation with the handle, the latter having a portion broken away;

Fig. 2 is a top view of the wrench as shown in Fig. 1;

Fig. 3 is a side elevation of my wrench with a portion of the handle broken away and showing the adjustable jaw mechanism in compressed condition preparatory to slidable adjustment thereof;

Fig. 4 is a vertical section of my adjustable wrench taken through the adjustable jaw mechanism on the line 4—4 of Fig. 1;

Fig. 5 is a side elevation of my wrench after having been adjusted to a piece of work and with the handle pivotally stressed to actuate the adjustable jaw mechanism; and

Fig. 6 is a segmental vertical section of the rack and pinion and sliding guide members of the wrench taken on the lines 6—6 of Fig. 5.

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Referring now more particularly to the drawing, my novel adjustable wrench is shown in normal non-operative position in Fig. 1. The wrench comprises an elongated body structure B which has in turn a fixed jaw 10 extending laterally from the general longitudinal direction of the elongated body B and a handle 11 pivotally connected intermediate the ends of the elongated body. The pivot structure may comprise a knuckle joint having semicircular outer bearing surfaces 12 forming an integral part of the handle 11 and a cooperating semicircular inner portion 13 integrally connected with the rack portion 14 which forms a portion of the fixed jaw 10. Details of the knuckle joint are shown in the vertical section of Fig. 4. A pivot pin 15 extends through the knuckle joint for rotation of the handle 11 through a small arc. Longitudinally disposed in the rack portion 14 of the wrench is a groove 16. A corresponding groove 16 may be formed in the opposite side of the rack member 14 as shown in detail in Fig. 6. The rack 14 has at its upper surface a series of toothed elements 17 which may be notched into the upper surface of the rack in alignment with the upper surface of handle 11. A gripping plate 18 may be removaby attachled to the fixed jaw 10 with its gripping face disposed in a rearward direction. Slidably mounted upon the elongated body structure B of the wrench is an adjustable jaw mechanism which is indicated generally by the letter M. The adjustable jaw mechanism comprises a supporting frame or sleeve 19 which is slidably mounted upon the elongated body structure B terminating at its upper portion in two upstanding flanges 21 as shown in Figs. 1 and 4. An indentation 22 is formed in each flange of the sleeve member 19 and a movable jaw member 23 is pivotally mounted upon the sleeve 19 at 24. The movable jaw 23 may have secured thereto at its uppermost surface a shield 25 which is adapted to overlie the upper edges of the flange members 21 to prevent the fingers of the operator from becoming pinched or crushed. Details of the shield and pivot arrangement are shown in Fig. 4. A leaf spring 26 is mounted between the recessed portions 22, the end of which leaf spring bears against the underside of the jaw 23 at a point rearwardly of the pivot 24. A pinion sector 27 lies forwardly of the pivot pin 24 and may be integrally formed from the movable jaw 23. The pressure of leaf spring 26 normally maintains the pinion sector 27 in engagement with the teeth 17 of the rack portion 14. At the rearward portion of the movable jaw 23 is a bearing surface or cam 28 lying a short distance above the upper cooperating surface 29 of handle 11. Another leaf spring 30 is attached to the rearward portion of movable jaw 23 at the cam surface thereof and extends inwardly and downwardly to engage a

portion of the cooperating surface 29 of handle 11. The leaf spring 30 maintains the handle 11 normally in aligned relation with the rack portion 14, both said handle and rack portions engaging the bottom of sleeve 19. A rib 31 is pressed into the upstanding flanges 21 at each side of sleeve 19 to cooperatively slide in groove or guide 16. The members 12 of the knuckle joint prevent the entire adjustable jaw mechanism M from sliding back the entire length of handle 11 since the ribs 31 engage the knuckle joint during such rearward retraction of the adjustable jaw mechanism. Likewise, the forward travel of the adjustable jaw mechanism M maintains the pivot point 15 within the sleeve structure since the jaw faces 18 and 32 come into engagement at the forward limit of travel of the movable jaw.

The wrench may be assembled and disassembled by moving the adjustable jaw mechanism M to its most forward position as previously described, at which position opposed openings 33 in the side flange members 21 of the sleeve 19 will expose the pin 15. The pin 15 may be removed or inserted into the knuckle joint for disassembling or assembling the wrench. It will be noted that during normal usage of the wrench the pivot pin 15 and the entire knuckle joint thereabout will lie within the sleeve 19 which is essential to the operation of my wrench presently to be described.

During the use and operation of my adjustable wrench the operator grasps the adjustable jaw mechanism M and compresses the shield 25 relative to the sleeve member 19 so as to cause the leaf spring 26 to be depressed. The depression of leaf spring 26 will cause a rocking movement of movable jaw 23 about the pivot pin 24 which, in turn, will disengage the pinion sector 27 from the toothed rack 14, providing sufficient clearance for the adjustable jaw mechanism to be rapidly adjusted by a forwardly or backwardly sliding motion to the desired spacing between the jaw faces 18 and 32. A representative piece of work in the form of a pipe 34 is placed upon the rack 14 and in contact with the jaw face 18 of the fixed jaw 10. The adjustable jaw mechanism is then brought up against the pipe 34 with the jaw face 32 in contact therewith. Upon release of the leaf spring 26 the pinion sector 27 will again engage the rack teeth 17 as shown in Fig. 1 with the jaw teeth cooperatively gripping the pipe 34 as in Fig. 5. Upon upward stress against the handle 11 the bearing surface 29 of handle 11 will engage the cam surface 28 of the movable jaw 23. The spring 30 will be in compressed relation and direct pressure will be brought to bear upon the cam surface 28. The movable jaw 23 is thus caused to pivot about the pin 24 which in turn depresses the pinion sector 27 into firm engagement with the toothed rack 14 and at the same time tilts forwardly to a slight degree the jaw face 32 so as to grip more firmly the surface of pipe 34. Continued pressure upon the handle 11 will cause tighter gripping of the pipe jaws and at the same time a more firm setting between the pinion sector 27 and the toothed rack 14.

The jaw faces 18 and 32 may be removable as shown, having short studs 35 socketed in the jaw 10 and studs 36 socketed in the movable jaw 23. A spring clip 37 may secure the jaw face 18 to fixed jaw 10 and spring clip 38 may be employed to secure the jaw face 32 in position on movable jaw 23. Where it is desired to employ the wrench upon nuts or other pieces of work having plane surfaces the serrated jaw faces 18 and 32 may be removed and the remaining plane surfaces upon the jaw members 10 and 23 employed in the same usual manner.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. An adjustable wrench, for turning a piece of work against stress, comprising an elongated rack having a laterally extending jaw attached at one end thereof and a handle member pivotally connected at the other end thereof, said handle member normally being in aligned relation with the general elongated disposition of said rack, an adjustable sleeve slidably mounted upon said handle and rack, and a second jaw rockably mounted upon said adjustable sleeve, said second jaw being normally spring pressed into secure engagement with said rack and rockable against spring pressure into disengagement therefrom, whereby said second jaw may be quickly adjusted according to the size of said piece of work.

2. An adjustable wrench, for turning a piece of work against stress, comprising an elongated rack having a laterally extending jaw fixed at the forward end thereof and a handle member pivotally connected at the rearward end thereof, said handle member normally being in aligned relation with the general elongated disposition of said rack, an adjustable sleeve slidably mounted upon said handle and rack, a second jaw rockably mounted upon said adjustable sleeve, a pinion sector fixed at a forward position to said second jaw, and a cam on said second jaw at the rearward end thereof for engagement with said handle whereby rotational pressure upon said handle will cause said second jaw to firmly grip both the rack and said piece of work disposed between the fixed jaw and the second jaw.

3. The subject matter of claim 2, and spring means for maintaining said handle member in normally aligned relation with said rack and for normally maintaining said pinion sector in engagement with said rack.

4. An adjustable wrench, for turning a piece of work against stress, comprising an elongated body having a laterally extending jaw secured at one end thereof and a handle member pivotally connected at the other end thereof, an adjustable sleeve slidably mounted upon said elongated body, and extending laterally therefrom in the same direction as said jaw, a second jaw rockably mounted upon said adjustable sleeve at its laterally extending portion, said jaw being resiliently engaged with said elongated body under normal relaxed circumstances and being engageable by said handle member to rock said second jaw toward said first mentioned jaw while maintaining secure gripping relation with said elongated body.

ESTEL E. FLORENCE.

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