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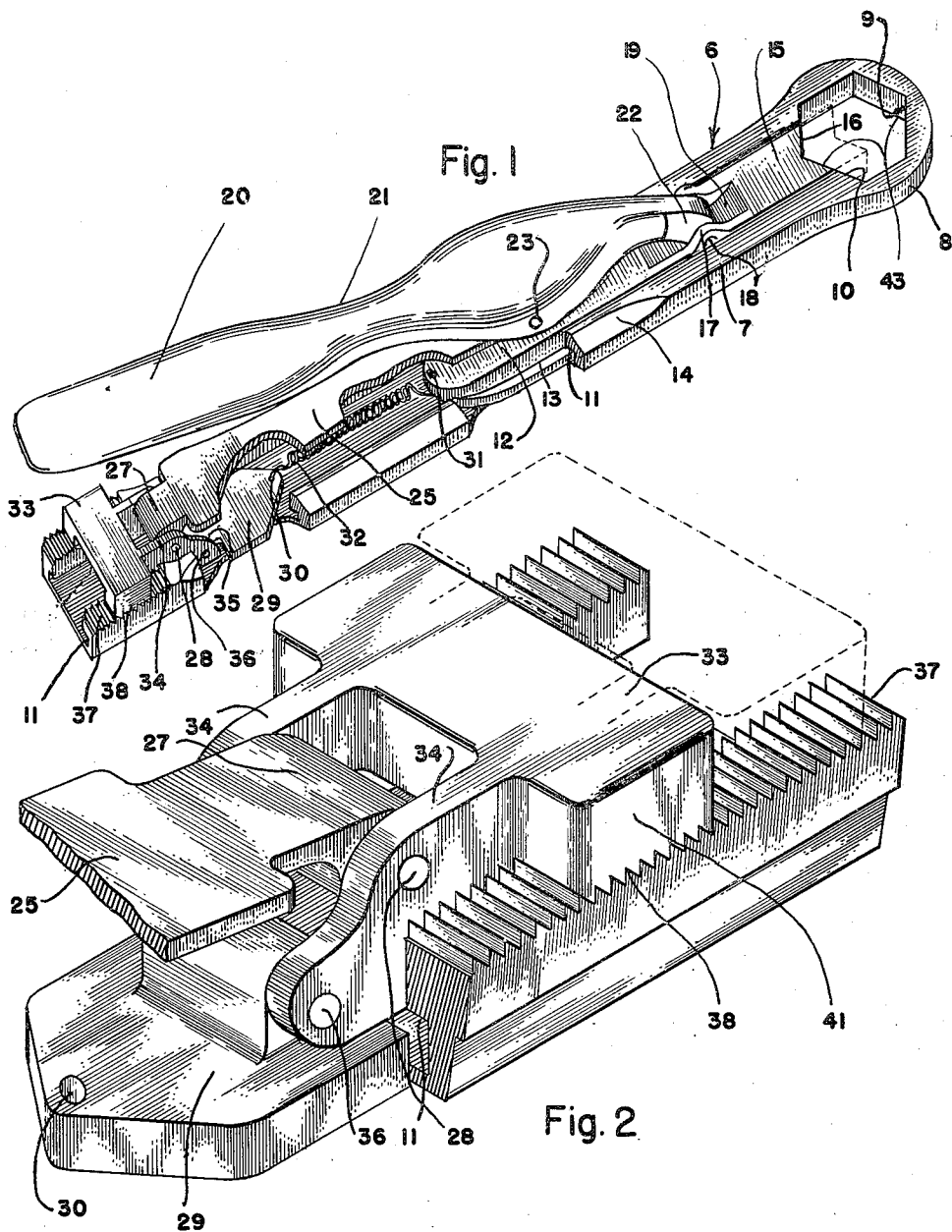
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2,587,263

TOGGLE-ACTUATED SLIDABLE JAW WRENCH

Filed May 26, 1950

2 SHEETS—SHEET 1



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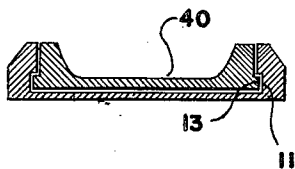
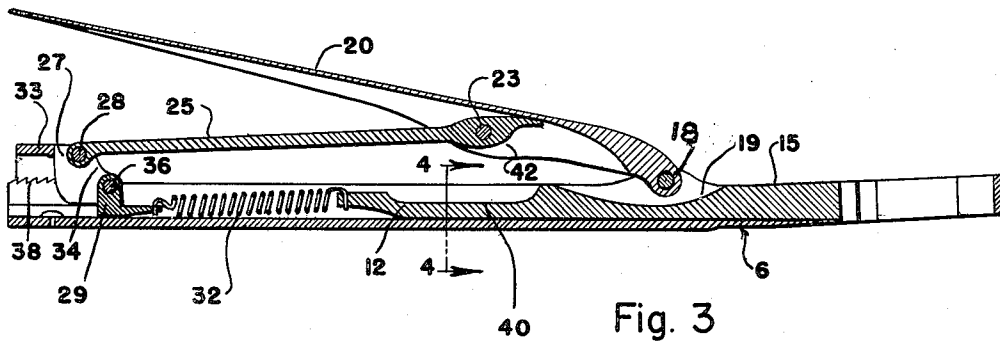
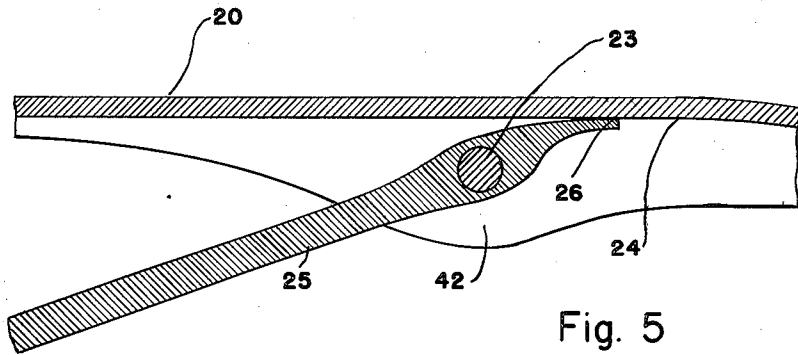
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TOGGLE-ACTUATED SLIDABLE JAW WRENCH

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2 SHEETS—SHEET 2



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TOGGLE-ACTUATED SLIDABLE JAW
WRENCH

Gustav A. Wortelmann, Chicago, Ill.

Application May 26, 1950, Serial No. 164,337

5 Claims. (Cl. 81-85)

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My invention relates to a toggle-actuated slidable jaw wrench, and is particularly directed to that type of wrench, which may be made rapidly adjustable to accommodate various size ranges of bolt heads and nuts, and instantaneously tightened on the head or nut.

An important object of my invention is to provide a wrench of the aforementioned character, which is provided with toothed elements utilized for setting the wrench to conform to different ranges of sizes in order to accommodate heads of bolts and nuts of varied lateral or polygonal formation, and of varied dimensions within the range of adjustment.

Another object of my invention is to provide an adjustable wrench of the aforementioned character, which is provided with a slide portion within the base, the said slide and a head portion of the said base acting as the wrench head for gripping bolts and nuts, the slide element having articulately secured thereto a handle element and an intermediate toggle element interconnecting pivotally a toothed adjusting pawl and the said handle element.

Another object of my invention is to provide slide means in a wrench of the aforementioned character which is urged normally to inoperative position by spring means, and which is provided with means for gripping nuts and bolt heads of various sizes by pressure exerted on the said handle, in turn translated to a sliding movement of the said slide element so that the nut or bolt may be grasped or gripped readily and effectively.

Another object of my invention is to provide toggle-like adjustable wrench means which is adapted to fit loosely over the head of a bolt or a nut, yet by compression of the handle element in the normal action of gripping the wrench, the initial action of the wrench will be made to grasp the bolt head or nut firmly in order that continued pressure will hold the bolt head or nut for tightening or loosening as the case may require.

A further object of my invention is to provide in a wrench of the character aforesaid a head having an opening for receiving the work piece which in normal aspect is hexagonal, there being a wall portion movable with respect to the head for changing the distance across the corners to a smaller dimension for gripping various sizes of bolt heads or nuts.

A further object of my invention is to provide an instrumentality of the aforementioned character which is practical in construction, efficient in its operation, ideally suited for the work which

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it is purported to perform, and of such simple elemental construction as to lend itself admirably to economical manufacture in quantity production.

Other objects, ancillary advantages, and inherent features, resident in my invention will become apparent from an examination of the accompanying drawings, bearing further elucidation in the ensuing description so that those familiar with the art will have no difficulty appraising themselves of the teachings indicated in the disclosure to follow, and in which like elements of construction are designated by the same symbols in the various views, in which:

Fig. 1 is a perspective view of my invention with certain portions thereof broken away, and indicated in cross section, in order to more clearly illustrate the operation and construction thereof.

Fig. 2 is an enlarged perspective view of the adjustable toothed means utilized in the construction comprising my invention.

Fig. 3 is a longitudinal cross-sectional view taken on Fig. 1 but not indicated thereon.

Fig. 4 is a transverse cross-sectional view taken substantially on the line 4-4 of Fig. 3.

Fig. 5 is an enlarged fragmentary view showing the recessed handle element and the intermediate toggle element connected thereto for intensifying the effective pressure as related to the pressure exerted upon the slide element, in order to most effectively grip a bolt head or nut.

Referring to the various views, my invention is generally designated 6, and consists of a base element 7 having an enlarged partially circular head portion 8, in which is formed an opening having four sides of regular hexagonal formation, plus two interrupted sides 10 and 16, to define a complete regular hexagonal bolt head receiving opening.

The base 7 may be chamfered at 14 in order to lighten the weight thereof, and it is also provided with a slide recess 11 therein (Fig. 4) in order to guide the various elements such as the slide element 12, having a slide tongue 13 operating in the said slide recess 11; the said slide is provided with a head portion 15 and a recessed portion 19 forming the bearing lugs 17 to which the pivot pin 18 is fastened. The pivot pin 18 also has the province of securing articulately the tongue portion 22 of the handle 20 thereto. The handle 20 may be suitably narrowed at 21 in order to afford a convenient grip for the hand of a person using the wrench. The handle 20 is also provided with skirt portions 42 for strengthening the same, and for holding the pivot pin 23 to

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which is articulately secured the toggle lever 25. The said toggle lever 25 at its forward end is provided with a bearing lip portion 26 (Fig. 5) operating against the inner surface 24 of the handle. The rear end of the toggle lever 25 is provided with a reduced boss extension 27, which is articulately secured by virtue of the pivot pin 28 to the adjustable rack element pawl 33 provided with teeth 38, in meshing engagement with the complementary toothed portion 37 at the rear end of the base 7.

The toothed adjusting rack 33 is further provided with a pair of ears 34 constituting a pawl and serving to secure the pivot pin 28 in position, and also for securing the pivot pin 36 which is positioned at the lower portion of the ears 34 and which serves to secure articulately the connecting tongue 29 and is adapted to swing freely thereon. The pivot pin 36, being attached to lip 35, serves as a fulcrum when it is desired to unmesh the toothed portion 38 from the toothed portion 37 at a time when it may be desired to adjust the same as indicated by the dotted lines of Fig. 2.

The faces 41 of the element 33 are suitably knurled so that they may be conveniently gripped to lift the teeth out of engagement or to set them into engagement when adjustment is made. The tongue element or dog 29 has secured thereto a bored opening at its front portion for the spring element 32 which has a coil 30 anchored therein, and a similar anchorage is provided in the slide element 12 anchoring the other end 31 of the spring 32.

Thus looking at Fig. 1, it will be noted that the opening is adjusted to an equilateral hexagonal formation of a given size, so that if a nut within that range were to be gripped for tightening or loosening the opening would be placed over the bolt head or nut to be adjusted. The first initial pressure in gripping the wrench assembly would have a tendency to compress the handle 20 thus advancing the head 15 of the slide element 12 until the nut is gripped by opposite faces, whereupon the nut can be tightened or loosened. Release of the grip enlarges the hexagonal opening permitting the wrench to be lifted therefrom, the spring 32 effecting appropriate retraction.

In the action of gripping, it will be noted that pressure on the handle element 20 causes actuation of the toggle element 25 by virtue of pressure of the inner surface 24 against the lip 26 of the toggle element 25 with its fulcruming points at 23 and 28 which had been adjusted to the proper position, thus advancing the head 15 by toggle pressure action and firm grip of a bolt head or nut in the resultant opening formed by the laterals 9 and 16.

It may also be desirable to adjust the wrench, for example, to a position where the head 15 is normally the retracted position shown by the dotted lines in Fig. 1; thus a nut fitting within the increments of the bracket of magnitude 43, can be held by the wrench and operated upon, or the wrench may be adjusted to some other dimension. Such action may be accomplished by tilting the pawl 33 out of engagement with the rack and sliding the entire assembly appurtenant thereto forwardly or rearwardly, and then re-engaging the same. It will be understood that during such adjustment the handle 20 will be left in inactive position. Moreover it will be noted that the pivot 26 is disposed substantially in the same plane as the "pitch line" of the teeth

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38, and that the pivot 28 is thereabove. Thus pressure exerted through the link 25 is effective to pivot the pawl 39 about the pivot 36 thereby to insure positive engagement of the pawl and ratchet. By "pitch line" I intend to refer to a line parallel with the crests of the rack teeth and positioned midway between said crests and the roots of the teeth.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

Having thus disclosed and revealed my invention, what I claim as new and desire to secure by Letters Patent is:

1. A toggle-actuated, slidable jaw wrench comprising a body including a fixed jaw part, a slidable jaw part for cooperation with said fixed jaw part for gripping the work, said jaw parts having mutually engageable means to maintain aligned relation therebetween, said body part having ratchet teeth transversely thereof, a pawl engageable with said teeth, an operating handle hinged to said slidable jaw part, and a link pivotally interconnecting said handle and pawl for combined toggle action, a dog slidably guided in said body and a pivotal connection having an axis transversely of said body and between said dog and pawl whereby said pawl may be swung from engagement with the teeth and re-engaged therewith to change the inactive relation of said jaw parts, and a spring intermediate said dog and movable jaw part to maintain said pawl in tight contact with said teeth and to retract said movable jaw part upon release of said handle.

2. A toggle-actuated, slidable jaw wrench comprising a body including a fixed jaw part, a slidable jaw part for cooperation with said fixed jaw part for gripping the work upon actuation of said slidable jaw part, said jaw parts having interengaging tongue and groove means to maintain lateral sliding relation therebetween, said body part having two independent rows of transversely-positioned ratchet teeth each disposed along a margin thereof, a pawl having two sets of independent teeth for engagement respectively with said rows of ratchet teeth, said rows of ratchet teeth defining a recess therebetween, an operating handle hinged to said slidable jaw part, and a link pivotally interconnecting said handle and pawl for combined toggle action, a dog slidably engaged in said recess and having a pivotal connection with said pawl, the axis of said connection being transverse of said body, whereby said pawl may be swungly disengaged from said teeth and re-engaged in another position with respect thereto to change the inactive relation of said jaw parts, and a tension spring intermediate said dog and movable jaw part to maintain said pawl in tight contact with said ratchet teeth and to retract said movable jaw part upon release of said handle.

3. A toggle-actuated slidable jaw wrench comprising a body including a fixed jaw part, a slidable jaw part for cooperation with said fixed jaw part for gripping the work, said jaw parts having mutually slidably engaged means to maintain aligned relation therebetween, said body having ratchet teeth, an operating handle hinged to said slidable jaw part, a pivot carried by said handle and a pivot carried by said pawl, a link pivotally connected at each end thereof to said pivots, that end of said link adjacent said han-

dle having a tongue arranged for abutment with said handle upon actuation of the latter to implement the wrench-closing action, a dog slidably carried in said body, transverse pivot means intermediate said dog and pawl for disengagement of said pawl from said ratchet and reengagement thereof in a different position to vary the capacity of said jaw parts, and bias means interconnecting said dog and sliding jaw part for maintaining said pawl in engagement with said ratchet and for retracting said slidable jaw part.

4. A toggle-actuated, slidable jaw wrench comprising a body including a fixed jaw part, a slidable jaw part for cooperation with said fixed jaw part for gripping the work, said jaw parts having mutually slidably engaged means to maintain aligned relation therebetween, said body part having ratchet teeth, an operating handle pivotally connected to said slidable jaw part, a pawl for engagement with said teeth, a link pivotally connected at each end to said handle and pawl respectively, a dog slidably mounted in said body part and having a transverse pivot therein, said pawl being carried on said pivot, the axis of said dog pivot lying substantially in the same plane

as the pitch line of said ratchet, and the axis of the pivotal connection for the pawl and of said link being displaced above said pitch line.

5. A wrench in accordance with claim 4 further characterized by a tension spring intermediate said dog and slidable jaw part.

GUSTAV A. WORTELMANN.

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