Nov. 2, 1948. O. M. GROSS 2,452,849

WRENCH WITH SPRING CLOSED JAWS AND HANDLE AND PAWL FEED

Filed Oct. 5, 1945

2 Sheets-Sheet 1

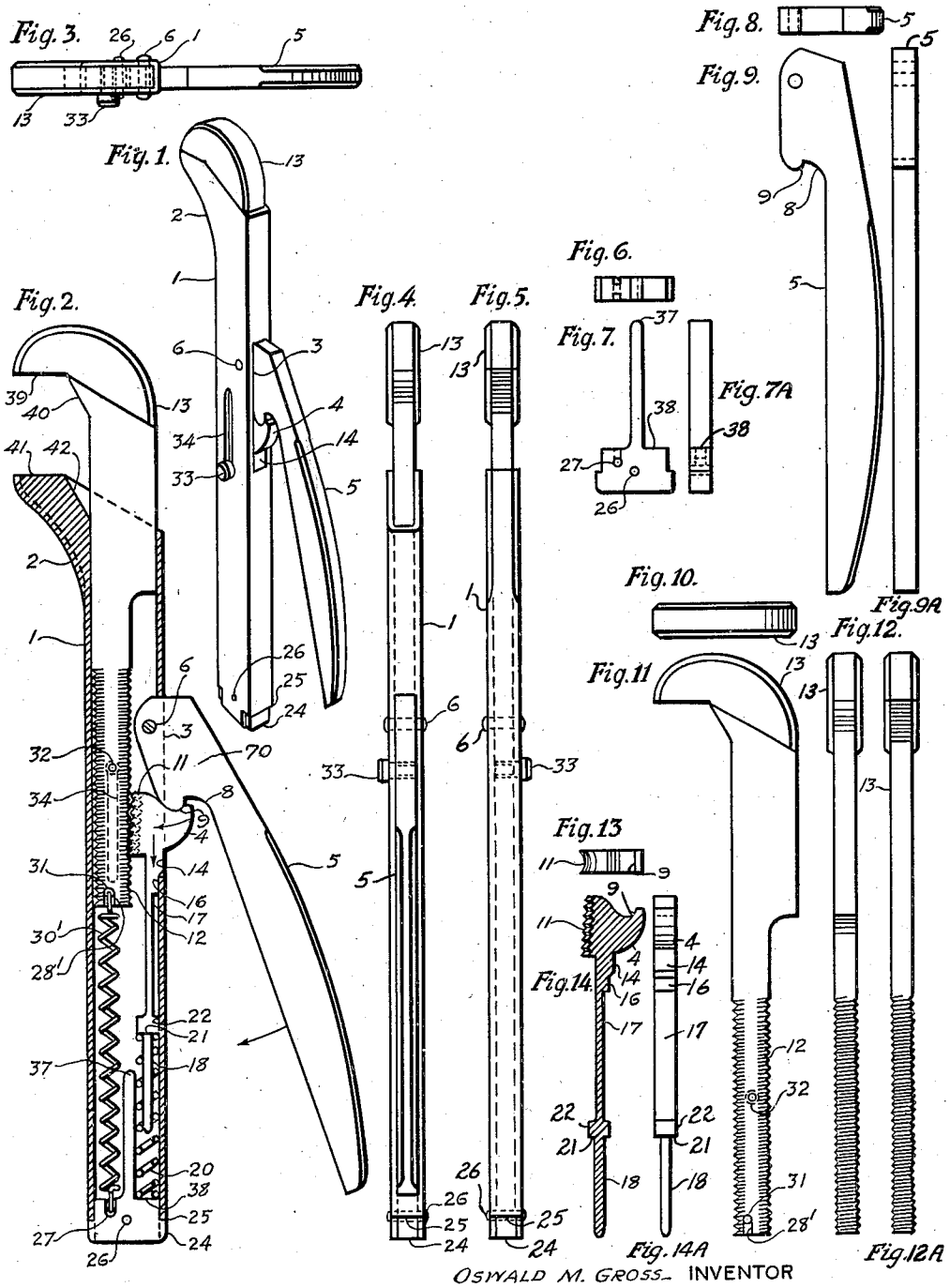

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Fig.15.

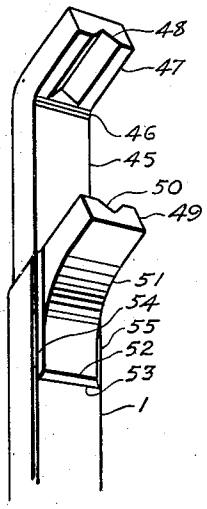


Fig.16.

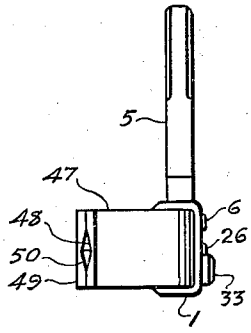


Fig.17.

Fig.18.

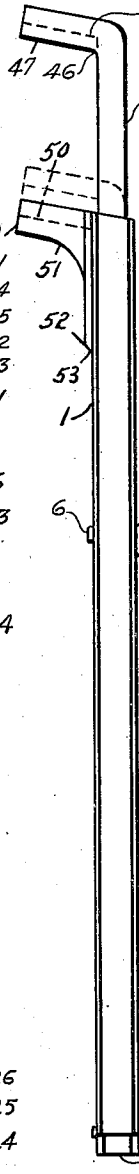
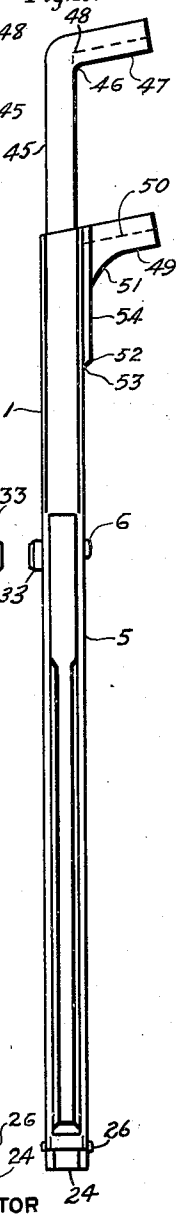


Fig.19.



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WRENCH WITH SPRING CLOSED JAWS AND HANDLE AND PAWL FEED

Oswald M. Gross, Detroit, Mich.

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4 Claims. (Cl. 81—89)

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This invention relates to wrenches and more particularly to that type of wrenches in which the jaws are self-adjusting to fit nuts and bolt heads of various sizes and shapes.

An object of the invention is to provide an improved and simplified wrench of the type indicated with a minimum number of parts and with the most of these parts inclosed in a tubular handle where they are protected from dirt.

A further object of the invention is to provide a wrench of this type which can be manufactured at a low cost in large quantities and which is simple in assembly and highly efficient in operation.

Further objects will more particularly appear in the course of the following detailed description.

The invention consists in the novel construction, arrangement, and combinations of parts hereinafter described and claimed.

Two sheets of drawings accompany this specification as parts thereof in which like reference characters indicate like parts throughout.

In the drawings:

Figure 1 is a perspective view of the improved wrench.

Figure 2 is a side view of the wrench in open position and partly broken away to disclose the operative parts.

Figure 3 is a plan view of Figure 2.

Figure 4 is a right-hand side view of Figure 2.

Figure 5 is a left-hand side view of Figure 2.

Figure 6 is a plan view of the base plate shown in Figure 2.

Figure 7 is a front elevation of the base plate shown in Figure 6.

Figure 7*a* is a side elevation of the plate shown in Figure 7.

Figure 8 is an end view of the operative handle.

Figure 9 is a side view of the operative handle.

Figure 9*a* is a back elevation of the handle shown in Figure 9.

Figure 10 is a plan view of the movable jaw member.

Figure 11 is a side view of the movable jaw member of the wrench.

Figure 12 is a side elevation looking from the right of the movable jaw member, shown in Figure 11.

Figure 12*a* is a side elevation of the jaw member looking from the left.

Figure 13 is a plan view of the slidable cam member.

Figure 14 is a vertical cross section through the slidable cam member.

Figure 14*a* is a side elevation of the slidable cam member.

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Figure 15 is a fragmentary perspective of the wrench having a modified form of jaws.

Figure 16 is a plan view of this modified form of wrench.

Figure 17 is a front view of this type of wrench with jaws open.

Figure 18 is a right-hand side view of the wrench shown in Figure 17.

Figure 19 is a left-hand side view of the wrench shown in Figure 17.

In accordance with the present invention a tubular handle 1 is provided formed at one end with a fixed jaw part 2 having an outwardly directed flat face 41 adapted to engage a nut or bolt and an angularly disposed face 42 adapted to receive a similar projection 40 formed on the movable jaw member 13. The movable jaw member 13 is provided with an inwardly directed face 39 adapted to coact with face 41 to engage a nut and with an extension shaped and proportioned to slide within the tubular handle member 1. This extension is cut away for the major part of its length to provide clearance in the tubular handle for a slide cam member and an operative handle as will be hereinafter described. The lower portion of the extension of jaw member 13 is threaded as shown at 12, or otherwise provided with transverse serrations and is also provided with a threaded hole 32 adapted to receive a thumb screw 33 which extends through a longitudinal slot 34 in the tubular handle 1 to permit manual adjustment of the jaw member 13 by the thumb of the user. The lower end of extension of jaw member 13 is provided with a slot 28' within which is positioned a transverse pin 31 adapted to anchor one end of a spiral spring 30' arranged to normally draw the jaw member 13 toward the tubular handle to engage a nut.

A second longitudinal slot 3 is provided in the tubular handle 1 opposed to the serrated face of the extension of jaw member 13 and within this slot is positioned the head 10 of the operative handle 5 which head is pivoted to the tubular handle 1 by the transverse pivot pin 6. This head is provided on its lower face with a radius clearance 8 adapted to co-act with the cam surface 9 formed on a slidable cam member 4 adapted for slidable movement within the longitudinal slot 3. The cam member 4 has a face confronting the serrated face 12 of jaw member 13 provided with similar serrations 11 adapted to co-mate with the serrations 12 to interlock the cam member 4 with the jaw member 13. The cam member 4 is further provided with a downwardly directed extension 14 also slidable in the longitudinal slot

3, a continuation of which is notched as at 16 to provide a sliding engagement with the inner face of the adjacent wall of the tubular member 1. A resilient extension 17 depends still further and terminates at its bottom in a head portion 22 also proportioned to slidingly engage the inner wall of the tubular member. From this head 22 depends a finger 18 adapted to snugly fit within a spiral compression spring 20, which spring will abut against the underface 21 of the head 22 and function to force cam member 4 upwardly in a straight line. The extensions 14, 17, and 18 are important in that they must maintain the cam member 4 normally in its outermost position and disengaged from the threads 12 of the jaw member 13 which necessarily makes important the arrangement of the compression spring 20.

To assure the proper positioning of the compression spring 20 and the tensile spring 30', a closure member 24 is provided adapted to seat in transverse slot 25 formed in the lower end of the tubular handle 1. This closure member 24 is provided with an upwardly directed finger 37, which serves to separate the tubular handle into two parallel spring dwells adapted to accommodate the lower ends of the spring 20 which is anchored at 38 and spring 30' which rests at 27 and in particular to maintain spring 20 in straight axial alignment. Closure member 24 is held in position in the tubular handle 1 by a transverse pin 26 extending through the side walls of the handle and through the closure member.

A modified form of the wrench thus described is illustrated in Figures 15 and 19 wherein the jaw members are formed as angularly disposed extensions 47 and 49, these extensions being provided on their inner confronting faces with complementary notches 48 and 50. It will be observed that the center lines of notches 48 and 50 lie in a common plane with the longitudinal axis of the tubular handle and that the longitudinal axis of these two notches are arranged parallel and at an angle to the longitudinal axis of the handle. The jaw 47 is preferably made of tool steel formed from a bar 45 bent as indicated at 46. The jaw 49 is preferably made as a separate part having an apron-like portion 52 forged from the main block of the jaw as indicated at 51 and secured by welding along the lines 53, 54, 55 to outer face of the wall of tubular member 1.

In using this wrench the hexagon corners of the nut head are engaged between the notches 48 and 50 and if so desired to use the flats of nut head, engagement can be made between surface 47 and upper surface of member 49 and by reason of the angular disposition of these notches and faces with respect to the tubular handle, the handle is elevated from the plane of the nut-head so as to permit ample clearance for the finger of the operator in rotating the tool.

The operating mechanism in this form of the wrench is identical with that previously described for the type illustrated in Figures 1 and 2. Various modifications in specific details will readily suggest themselves to those skilled in the art but within the scope of the present invention as claimed.

Having thus fully described my invention, I claim:

1. A self-adjusting wrench comprising a tubular handle formed at one end with a nut engaging jaw, a complementary jaw member formed with an extension slidable in the handle, said extension having transverse serrations, a cam formed with a face confronting the serrated portion of the jaw extension and similarly serrated, said cam slidable in the tubular handle, an operative handle pivoted on the tubular handle in alignment therewith formed with a cam face arranged to engage the slidable cam to operably engage said cam with the serrated jaw extension, a closure member for the tubular handle formed with a medial extension defining two parallel spring dwells in the handle, a compression spring seated in one dwell and engaging the slidable cam and an expansion spring having its ends anchored respectively to the slidable jaw and the bottom of the other spring dwell.

2. Self-adjusting wrench comprising a tubular handle formed at one end with a nut engaging jaw, a complementary jaw member formed with an extension slidable in the handle, said extension having transverse serrations, the tubular handle having a longitudinal slot in its wall confronting the serrated part of the jaw member, a cam member formed with a face confronting the serrated portion of the jaw member and similarly serrated, said cam slidably positioned in said longitudinal slot, an operative handle pivoted on the tubular handle with a head part operative in the longitudinal slot, said head formed with a cam face arranged to engage the slidable cam to operably engage said cam with the serrated jaw extension, a closure member for the tubular handle formed to provide dwells for two springs arranged respectively to draw the jaw member toward the tubular handle and force the slidable cam against the cam face of the operative handle.

3. A wrench as specified in claim 2 in which the slidable cam is formed with a resilient extension terminating in a head constituting a seat for a coil spring, said head having a finger adapted to seat slidably in and maintain said spiral spring in longitudinal alignment.

4. A wrench as specified in claim 2 in which the cooperative cam faces on the slidable cam and operative handle are so formed that initial rocking of the handle will move the cam transversely of the tubular handle to interengage its serrations with those of the jaw member and further rocking of the handle will force the cam and associated jaw member downward in the handle against the pressure of the spring associated with the cam member.

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