Nov. 27, 1945. A. ROBER 2,389,933

WRENCH

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Fig. 1.

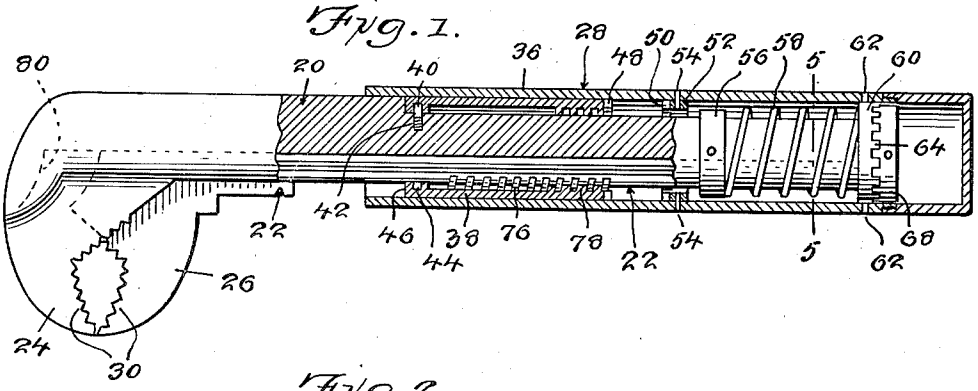


Fig. 2.

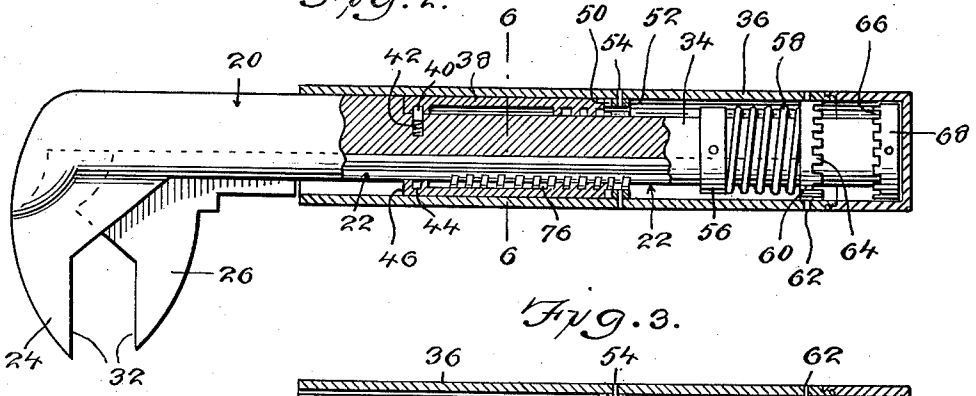


Fig. 3.

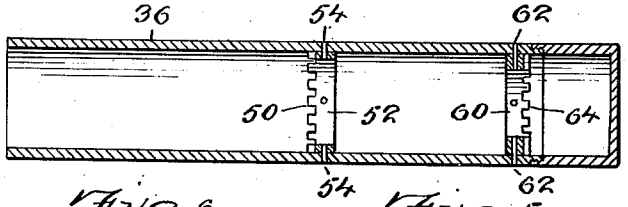
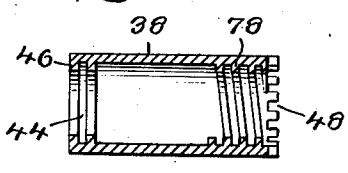
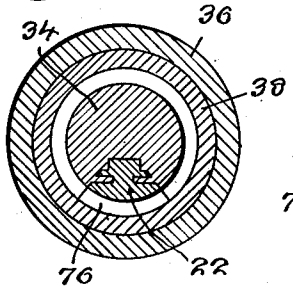


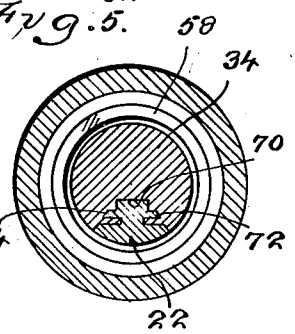
Fig. 6.

Fig. 5.

Fig. 4.







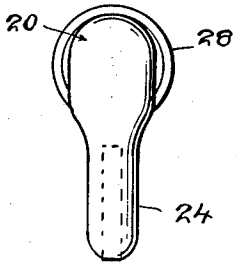


Fig. 7.

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Fig. 8.

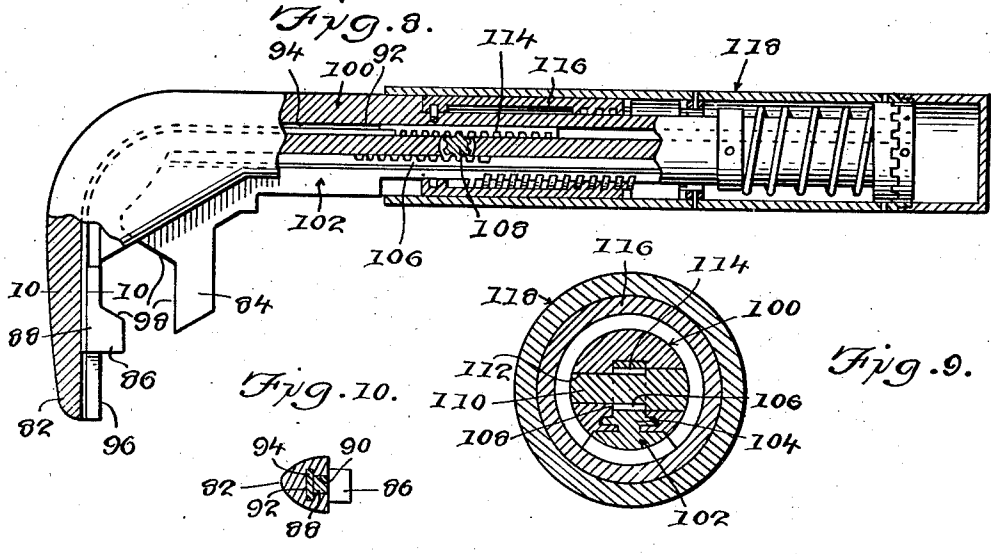


Fig. 10.

Fig. 9.

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UNITED STATES PATENT OFFICE

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WRENCH

Anton Rober, Milwaukee, Wis.

Application December 30, 1942, Serial No. 470,610

8 Claims. (Cl. 81—155)

My invention relates to wrenches, and has among its objects and advantages the provision of an improved adjustable wrench which is easy to manipulate and in which novel means are incorporated for retaining an adjustment against accidental shifting.

In the accompanying drawings:

Figure 1 is a partial longitudinal sectional view of a wrench in accordance with my invention.

Figure 2 is a similar view but in association with a slightly different form of jaw structure.

Figure 3 is a longitudinal sectional view of a sleeve handle.

Figure 4 is a longitudinal sectional view of an internal adjusting sleeve.

Figure 5 is a sectional view along the line 5—5 of Figure 1.

Figure 6 is a sectional view along the line 6—6 of Figure 2.

Figure 7 is a view of the jaw end of the wrench.

Figure 8 is a partial longitudinal sectional view of a modified form of wrench structure.

Figure 9 is an enlarged sectional view along the line 9—9 of Figure 8.

Figure 10 is a sectional view along the line 10—10 of Figure 8.

In the embodiment of the invention selected for illustration, I make use of two jaw shanks 20 and 22, which parts are respectively provided with jaws 24 and 26 projecting laterally of the longitudinal axis of the handle structure 28. The structures of Figures 1 and 2 are identical with the exception that the jaws 24 and 26 in Figure 1 are provided with gripping teeth 30, while the same jaws in Figure 2 are provided with parallel nut clamping faces 32.

The shank part 20 includes a cylindrical portion 34 lying wholly inside a sleeve handle 36. Upon the cylindrical part 34 is mounted a sleeve 38 which fits loosely inside the handle 36 and is restrained from relative longitudinal movement on the part 34 by a pin 40 lying in a bore 42 in the part 34 and projecting into a circumferential groove 44 in the inner face of the end flange 46 on the sleeve 38.

The opposite end of the sleeve 38 is provided with teeth 48 which are engageable by similar teeth 50 on a ring 52 fitting inside the handle 36 and fixed thereto by pins 54.

A collar 56 is fixed to the part 34 and constitutes an abutment for a compression spring 58 abutting a flange 60 pinned at 62 to the handle 36. This flange is provided with teeth 64 engageable by teeth 66 on a flange 68 attached to the part 34. Normally the spring 58 urges the part 34 forwardly to maintain engagement between the teeth 64 and 66, but the teeth may be disengaged by advancing the sleeve 36 jawward relatively to the part 34.

The part 34 is provided with a longitudinal groove 70 within which is slidably mounted the part 22. The groove 70 is provided with branch grooves 72 for the reception of flanges 74 formed on the part 22 so that the part 22 may be moved longitudinally of the part 20 but is restrained from lateral shifting.

The part 22 is provided with a rack 76 having meshing engagement with screw teeth 78 inside the sleeve 38. The jaw 24 is somewhat thicker than the jaw 26, and is grooved at 80 so that a portion of the jaw 26 may move freely therein.

In operation, the handle 36 may turn on the part 20. To adjust the jaw 26 relatively to the jaw 24, the handle 36 is shifted longitudinally of the part 20 to bring the teeth 50 into engagement with the teeth 48, after which the handle is rotated to impart rotary motion to the sleeve 38 and relatively to the part 34, so that the meshing engagement between the rack 76 and the teeth 80 impart longitudinal movement to the part 22 for adjusting the jaws 24 and 26 to the desired spacing. When the handle 36 is released, the spring 58 shifts the handle to the position of Figure 1, at which time the teeth 64 are brought into meshing engagement with the teeth 66 so that the handle 36 is latched to the part 34 and is restrained from relative rotary movement.

In Figure 8, the jaw 82 parallels the jaw 84, the two jaws being similar to the jaws 24 and 26 of Figure 2 with the exception that the jaw 82 is of considerably greater length and is provided with an adjustable jaw element 86. The element 86 has a rib 88 slidable in a groove 90 extending longitudinally of the jaw 82. This rib is connected with a flexible member 92 slidably guided in a groove 94 for adjusting the element 86 longitudinally of the jaw. The rib 88 lies flush with the nut engaging face 96 of the jaw 82, and the element 86, the jaw 82 and the jaw 84 are provided with nut engaging faces 98 so arranged as to have clamping engagement with nut and bolt heads of hexagonal contour. While the jaw 84 is adjustable toward and away from the jaw 82, means are provided for adjusting the element 86 longitudinally of the jaw 82 in corresponding amounts, so that the faces 98 will always have engagement with the faces of nut and bolt heads of different sizes. The element 86 is shifted

longitudinally of the jaw 82 as a function of relative adjustment between the jaws 82 and 84.

Externally the shanks 100 and 102 respectively connected with the jaws 82 and 84 are identical with the parts 20 and 22. The shank 102 is guided for movement longitudinally of the shank 100 in the same manner as the part 22, but the rib 104 is provided with rack teeth 106 meshing with a pinion 108 formed on a shaft 110 rotatably mounted in a transverse bore 112 in the shank 100. The flexible member 92 has a rack 114 fixed thereto and engaging the pinion 108. The shaft 110 is restrained from endwise movement through its engagement with the sleeve 116 corresponding to the sleeve 38. The handle structure 118 is identical with that illustrated in Figures 1 and 2, both externally and internally. The difference in the wrench structure of Figure 8 resides in the fact that longitudinal movement imparted to the shank 102 imparts rotation to the pinion 108 to move the flexible member 92 a distance corresponding to the movement of the rack teeth 106. When the jaw 84 is moved away from the jaw 82 to accommodate a nut of larger dimensions, the element 86 is moved outwardly longitudinally of the jaw 82 a distance corresponding to the shift of the jaw 84 so that the faces 98 will have accurate fitting engagement with the nut or bolt head.

Without further elaboration, the foregoing will so fully explain my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. A wrench comprising a first shank having a first jaw attached thereto, a second shank slidable longitudinally of said first shank and having a second jaw, a sleeve handle mounted for relative rotary and longitudinal movement on said first and second shanks, coacting but separable latch means on said first shank and said handle to normally restrain the latter from relative rotation on said first and second shanks, a screw sleeve rotatably mounted on said first and second shanks inside said handle, an operating connection between said screw sleeve and said second shank to adjust the latter longitudinally of the first shank through rotation of said handle, elements carried by the handle and said screw sleeve for engagement with each other through movement of said handle longitudinally of said first and second shanks to connect the screw sleeve to adopt the screw sleeve to be rotated by the handle relatively to the first and second shanks, and resilient means yieldingly holding said handle in a position engaging said latch means said element on said handle and screw sleeve being in spaced relationship to each other when the latch means on the handle and first shank are thus engaged.

2. The invention described in claim 1 wherein said first and second shanks are provided with coacting formations restraining either from rotation relatively to the other.

3. The invention described in claim 1 wherein said first shank is provided with a longitudinal groove and in which said second shank is provided with a ribbed like formation slidably guided in said groove.

4. The invention described in claim 1 wherein said operating connection comprises a rack fixed to said second shank and engaging said screw sleeve.

5. The invention described in claim 1 wherein said latch means comprise engageable toothed members carried respectively by said first shank and handle.

6. The invention described in claim 1 wherein said first jaw is provided with a jaw element movable longitudinally thereon, said jaw element and said first and second jaws having coacting clamp faces, and a second operating connection between said jaw element and said first operating connection for shifting said jaw element relatively to the first jaw distances corresponding to the relative shift of said first and second jaws.

7. The invention described in claim 1 wherein said first jaw is provided with a jaw element movable longitudinally thereon, said jaw element and said first and second jaws having coacting clamp faces, and a second operating connection between said jaw element and said first operating connection for shifting said jaw element relatively to the first jaw distances corresponding to the relative shift of said first and second jaws, said second operating connection including a flexible member attached to said jaw element and slidably guided in a groove in said first jaw and said first shank.

8. The invention described in claim 1 wherein said operating connection comprises a rack on said second shank engaging said screw sleeve, a jaw element slidably mounted on said first jaw, a second rack on said second shank, a third rack having an operating connection with said jaw element, and a pinion meshing with said second and third racks to shift said jaw element relatively to said first jaw when said second jaw is shifted relatively to said first jaw.

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