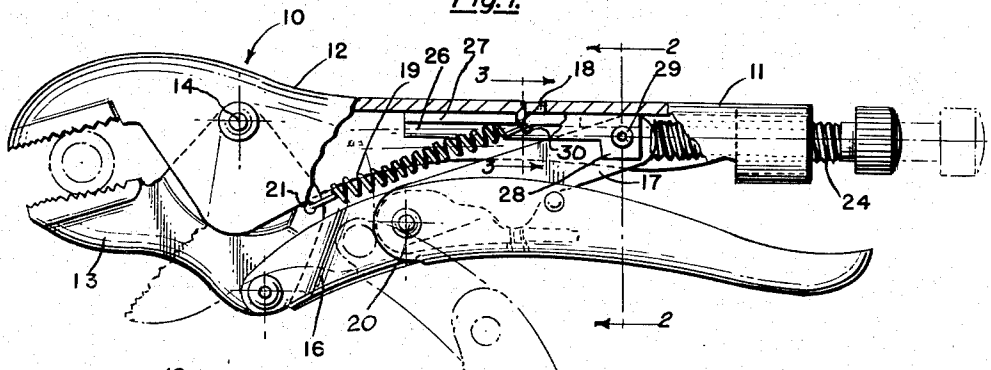
Nov. 30, 1954 H. A. BERGER 2,695,540

TOGGLE WRENCH

Filed April 17, 1953

Fig. 1.



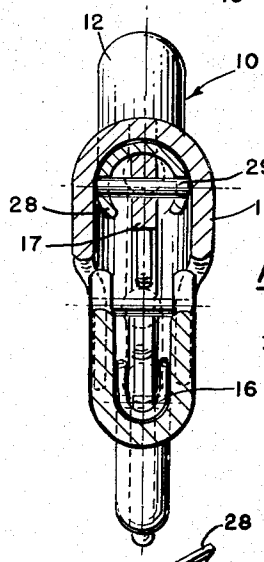


Fig. 2.

Fig. 3.

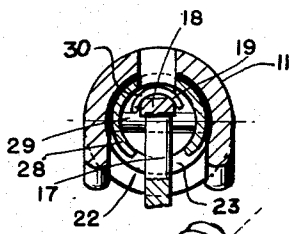


Fig. 7.

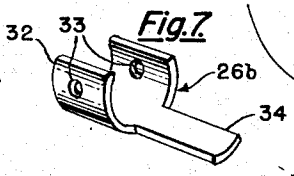


Fig. 4.

Fig. 5.

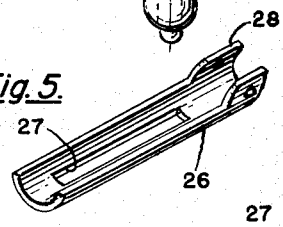
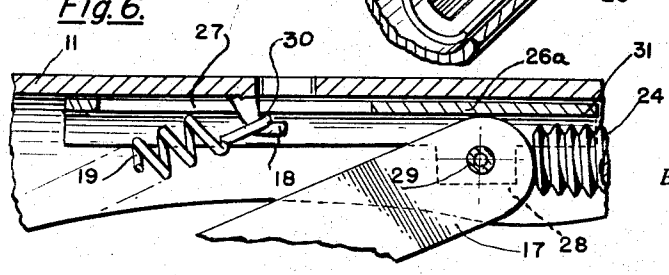


Fig. 6.



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TOGGLE WRENCH

Harold A. Berger, Plano, Ill.

Application April 17, 1953, Serial No. 349,482

1 Claim. (Cl. 81—84)

My invention relates to wrenches and more particularly to the type which are generally known as toggle wrenches or vise grip wrenches.

Wrenches of this type generally comprise a stationary jaw and a relatively movable jaw which is capable of being adjusted towards said stationary jaw, and a toggle arrangement effective to multiply the gripping pressure of the jaws.

One of the objects of my invention is the provision in a wrench of the character set forth of improved means for adjusting the fulcrum position of the toggle link so as to vary the adjustment of the movable jaw relative to the stationary jaw.

Another object of my invention is the provision of improved means in a wrench construction of the character set forth providing a movable fulcrum for the toggle link, the said means being economical to manufacture and being highly efficient in operation.

Other and further objects and advantages of my invention will become apparent from the following description when considered in connection with the accompanying drawings in which

Fig. 1 is an elevational view of a wrench in accordance with my invention, with certain parts thereof being broken away to show details of construction.

Fig. 2 is a cross sectional view on an enlarged scale taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a cross sectional view on an enlarged scale taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the handle portion of the wrench showing my invention applied thereto.

Fig. 5 is a perspective view of the movable fulcrum member.

Fig. 6 is a fragmentary cross-sectional view on an enlarged scale showing a modified embodiment of my invention.

Fig. 7 is a perspective view of another modified embodiment of a movable fulcrum member.

Referring to the drawings, the wrench comprises a channel shaped member **10** which may be assumed to be formed from pressed sheet metal, but of course may be otherwise formed, the said member having a handle portion **11** and a stationary jaw **12** at its forward end. A movable jaw member **13** is pivotally secured to the member **10** as at **14**. An articulated channel shaped operating lever **16** is pivotally secured at its forward end to the movable jaw **13** and a toggle link **17** is pivotally secured at one end to said operating lever as at **20** and to the handle, as will be hereinafter described. As will be seen clearly by reference to Figs. 1, 3 and 4 the handle portion **11** has a lug **18** struck out inwardly thereof to provide a hook for receiving one end of a coiled tension spring **19** the other end of said tension spring engaging in an aperture **21** in the movable jaw and the spring serving to normally urge the movable jaw **13** away from the stationary jaw **12**. The rearward end of the handle portion **11** terminates in a circular portion **22** to receive a threaded bushing **23** which is welded therein, the said bushing receiving an adjusting screw **24**. Received within the handle portion **11** is a slide member **26** which may be assumed to be formed of sheet metal. The said slide member is substantially arcuate in cross section and substantially concentric with the handle portion. The said slide member is provided with a longitudinally extending slot **27** having a length substantially equal to the travel of the adjusting screw **24**. The rearward portion of the slide member **26** is provided with a pair of integral ears **28** which are perforated to receive a pivot pin **29** which passes through an aperture in the toggle link **17** and pivotally connects the toggle link to the slide member **26**. As will be apparent by reference to Fig. 1, the end of the toggle link **17** is preferably rounded and extends slightly beyond the end of the slide member **26** so that the end of the adjusting screw **24** may freely abut the said rounded end of the toggle link.

The slot **27** is of sufficient width to freely accommodate the struck out lug **18** in the handle portion so that the slide member **26** may move within the handle portion longitudinally within the limits of the slot **27**. The loop end **30** of the spring **19** is hooked on to the struck out lug **18** after the slide member **26** has been assembled to the toggle link and placed in the position illustrated in Fig. 4 and since its diametral dimension is greater than the width of the slot **27** it will be apparent that the said loop serves as a means for retaining the slide member **26** against displacement from the handle portion while permitting longitudinal movement of the slide member relative to the handle portion. Because the spring **19** is formed of tempered steel and consequently is relatively hard, any wear thereof which might result from frictional engagement of the slide member with the spring due to adjustments of the adjusting screw is minimized. The slide member **26** thus retains the end of the toggle link within the handle portion **11** and in position to abut the adjusting screw during use of the wrench and during any adjustments of the toggle link **17** by the adjusting screw **24**. Since the adjusting screw **24** directly abuts the end of the toggle link **17** no stress is applied to the slide member **26** and consequently, since its only function is to retain the end of the toggle link **17** within the end of the handle portion, the slide member may be made of relatively inexpensive thin guage sheet metal.

In the modification illustrated in Fig. 6, the slide member **26*a*** which in all other respects is identical with slide member **26**, hereinabove described, is provided with an integral rear extension **31**, which, as will be seen in Fig. 6, overhangs the end portion of the adjusting screw **24** and further provides additional securement for preventing displacement of the end of the toggle link from the handle portion. Since the spring **19** normally tends to urge the end of the toggle link **17** in the direction of the adjusting screw **24**, it will be seen that the abutting relation between the end of the adjusting screw and the toggle link is maintained at all times so that the extension **31** of the slide member provides in effect a shoulder for retention of the slide member within the handle portion of the wrench.

In the modification illustrated in Fig. 7 the slide member **26*b*** comprises an arcuate portion **32** having registering perforations **33** to receive a pivot pin for pivotally securing the toggle link **17** thereto. Integral with said arcuate portion is a rearward extension **34** similar to extension **31** of slide member **26*a***. As will be apparent the slide member **26*b*** corresponds to the rearward portion of slide member **26*a*** which includes ears **28** and extension **31**. The extension **34** of slide member **26*b*** is adapted to overlie the end of adjusting screw **24** in the same manner illustrated in Fig. 6 for preventing displacement of the end of the toggle link from the handle portion **11**.

Various changes coming within the spirit of my invention may suggest themselves to those skilled in the art. Hence I do not wish to be limited to the specific embodiments described or uses mentioned, but intend the same to be merely exemplary, the scope of my invention being limited only by the appended claim.

I claim:

In a wrench of the type having an elongated channel-shaped handle portion provided with a stationary jaw at the forward end thereof, a movable jaw mounted on said handle portion and arranged to co-operate with the stationary jaw to grip an article, a toggle for operating the movable jaw comprising an operating lever pivotally engaged at the forward end thereof to the movable jaw and a toggle link pivotally engaged at the ends to the handle portion and said operating lever intermediate the ends thereof, the operating lever extending longitu-

dinally adjacent the handle portion in spaced relation thereto and arranged to be squeezed by a hand engaging the handle portion and lever to lock the toggle, a helical spring having a loop at least on one end thereof, the handle portion having a lug on the inner surface thereof, engaged by the loop of said spring, the opposite end of said spring engaging the movable jaw, the improvement which comprises means for adjustment of the pivotal connection of the toggle link longitudinally along the handle portion comprising a longitudinally movable screw at the rear end of said handle portion, a slide member formed of relatively thin metal and substantially arcuate in cross section to conform to the contour of the inner surface of said handle portion, said slide member being carried entirely within said handle portion, means pivotally connecting said slide member to said toggle link so that the end of said screw is in direct abutment with an end of said toggle link, said slide member having a longitudinal slot to accommodate said lug

whereby said slide member may move longitudinally upon rotation of said screw, the width of said slot being less than the diameter of said loop so that said slide member is slidably retained within said handle portion by the end loop of said spring in engagement with said lug.

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