

Sept. 29, 1953

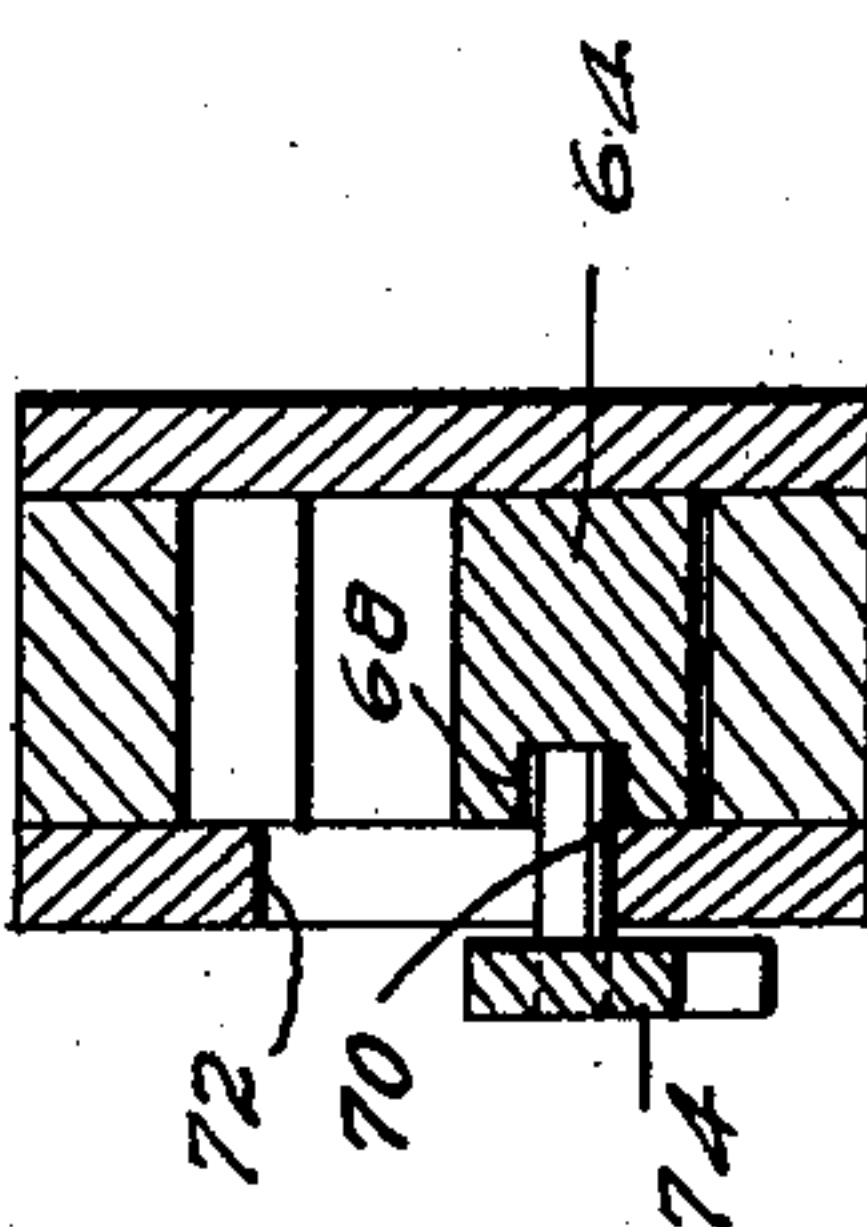
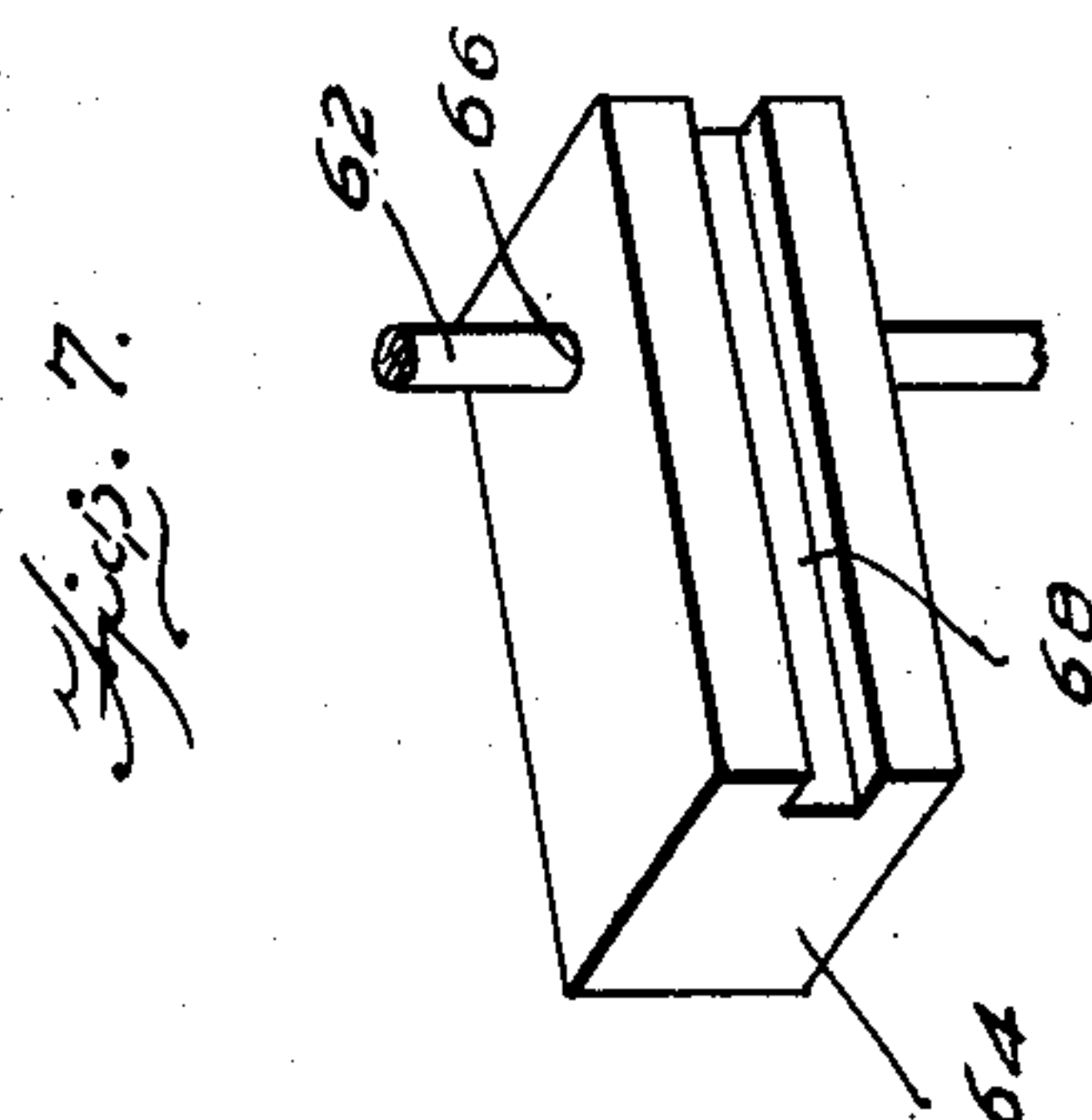
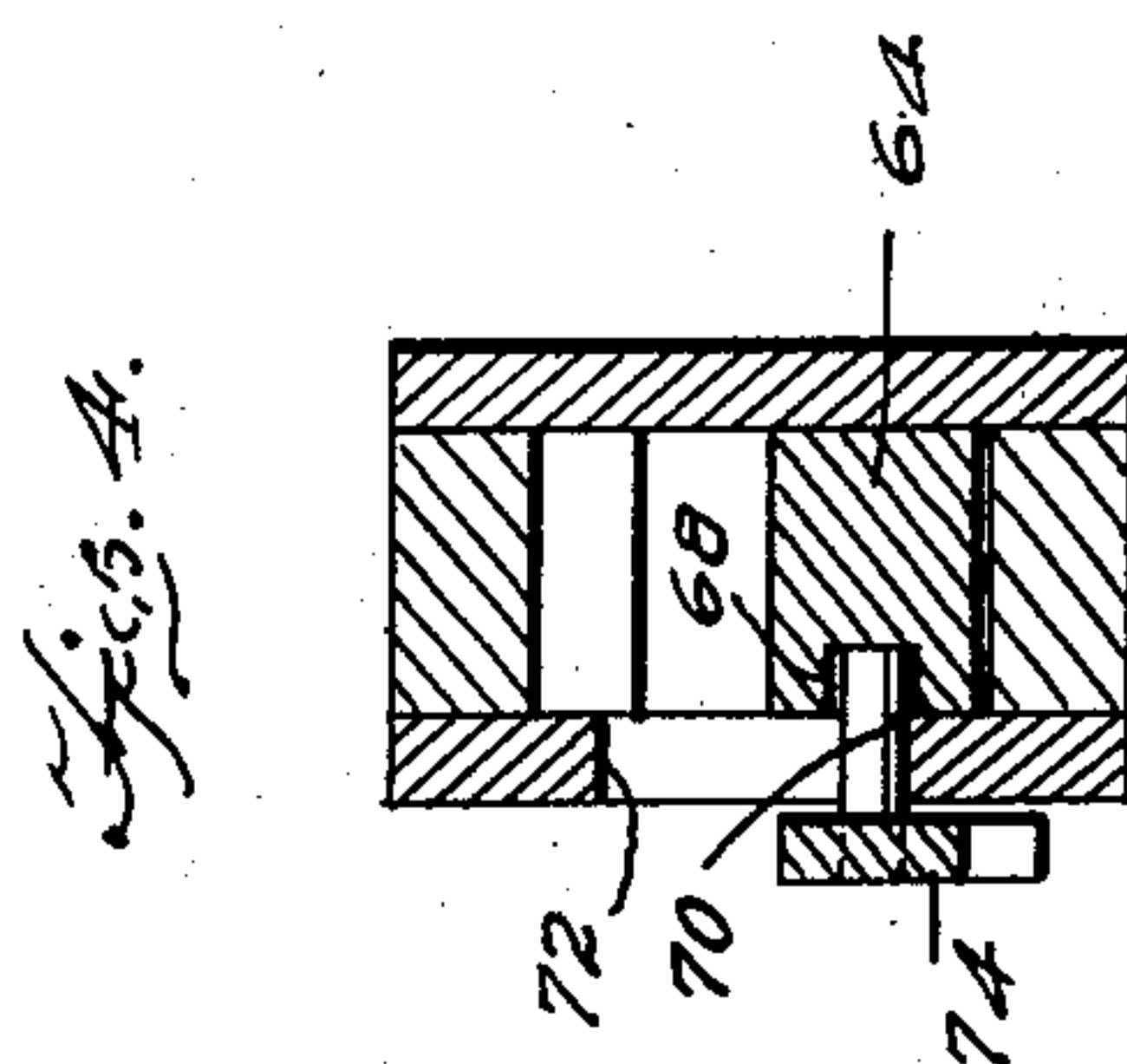
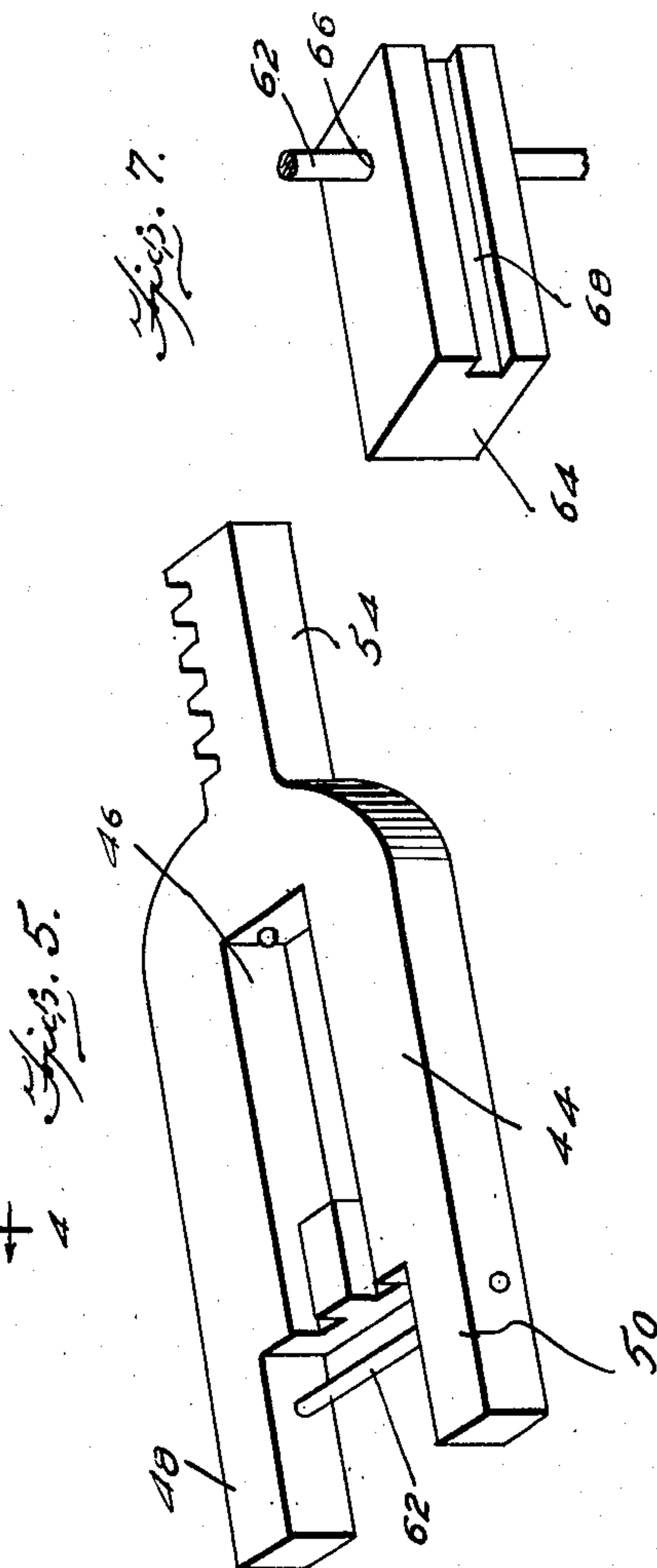
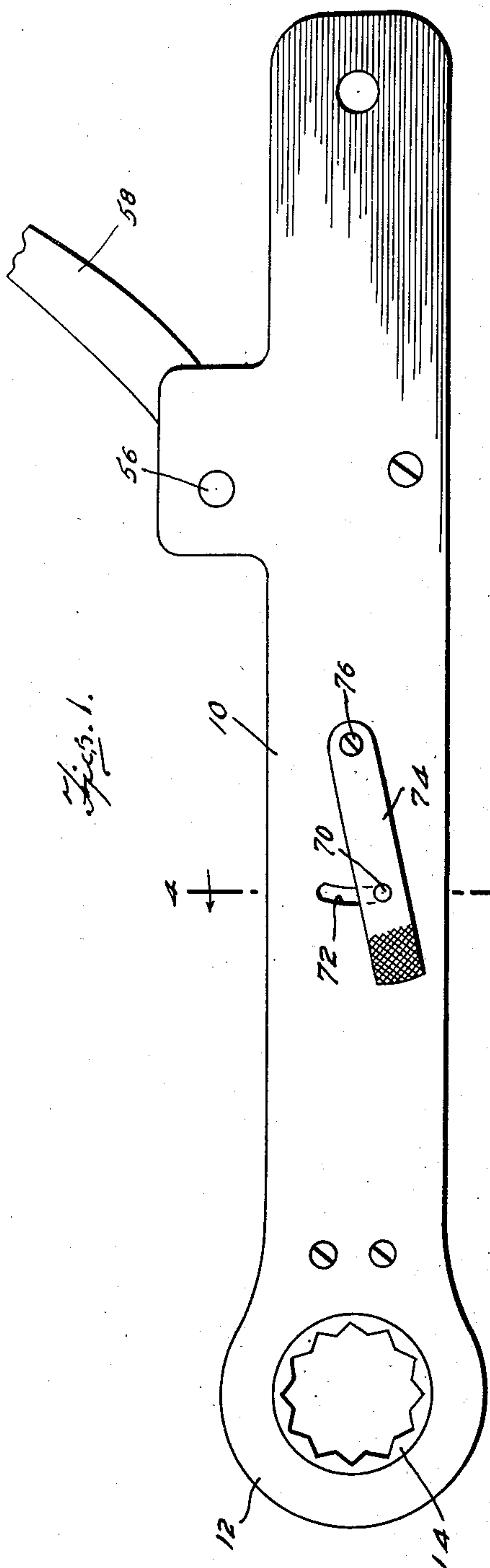
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2,653,500

WRENCH

Filed Nov. 22, 1950

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

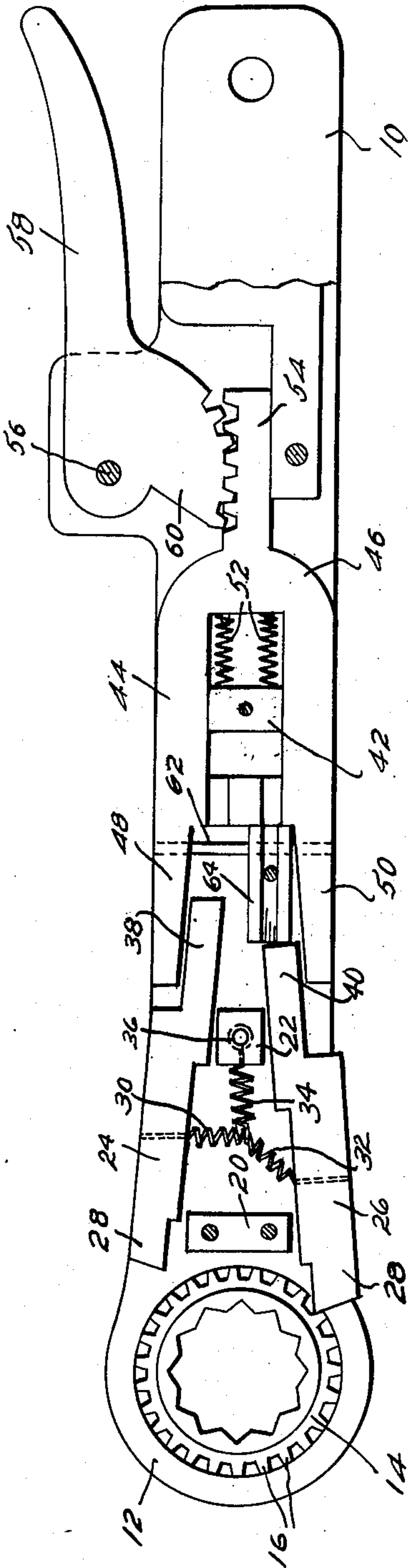


Fig. 3.

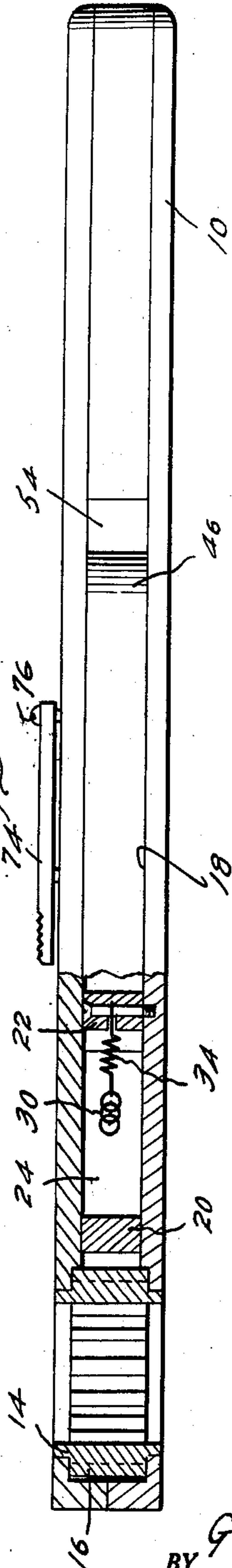
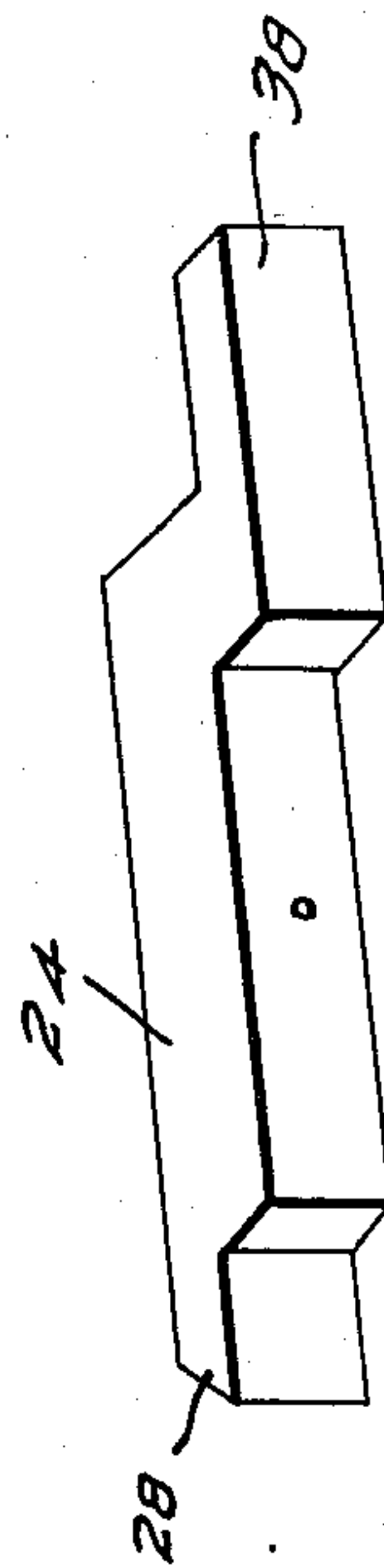


Fig. 6.



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WRENCH

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3 Claims. (Cl. 81—62)

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This invention relates to a wrench and more particularly to a wrench of the type having an elongated handle and a work engaging jaw mounted in the handle adjacent one end thereof for rotation about an axis which lies perpendicular to the longitudinal axis of the handle.

The primary object of the invention is to facilitate the rotating of nuts, bolts, or the like, particularly when the latter are located in inaccessible places.

Another object is to enable a nut or bolt to be rotated in a direction either to tighten or loosen it by a simple pumping of a lever on the handle of the wrench.

The above and other objects may be attained by employing this invention which embodies among its features a wrench of the type having a handle with a rotatable jaw mounted in one end thereof to rotate about an axis which lies perpendicular to the longitudinal axis of the handle, pawls carried by the handle and yieldingly held out of engagement with the rotatable jaw, a body mounted in the handle for movement longitudinally thereof toward and away from the jaw, means for positively advancing the body toward the jaw, and a block mounted on the body for movement transversely thereof into and out of engagement with one or the other of the pawls to cause the engaged pawl to advance into contact with the rotatable jaw and rotate said jaw relative to the handle.

Other features include means within the confines of the handle and operating against the body yieldingly to urge the body away from the jaw, and means extending through the handle and engaging a transversely movable block carried by the body for moving said block into or out of a position behind one or the other of said pawls.

In the drawing:

Figure 1 is a side view of a wrench embodying the features of this invention;

Figure 2 is a longitudinal sectional view through the wrench illustrated in Figure 1;

Figure 3 is an edge view of the wrench illustrated in Figure 1 showing a portion broken away more clearly to illustrate certain details of construction;

Figure 4 is a transverse sectional view taken substantially along the line 4—4 of Figure 1;

Figure 5 is a perspective view of the body;

Figure 6 is a perspective view of one of the jaw members; and

Figure 7 is a perspective view of the transversely movable block.

Referring to the drawings in detail a wrench handle 10 is provided adjacent one end with a head 12 in which is mounted for rotation about an axis which lies perpendicular to the longi-

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tudinal axis of the handle 10 a jaw or socket member 14 such as is commonly employed in ratchet wrenches. The socket member 14 is provided with an annular row of peripheral teeth 16 which are adapted to be engaged by the pawls to be more fully hereinafter described.

The handle 10 is chambered longitudinally as at 18 and extending between the walls of the chamber adjacent the head 12 is a guide block 20. A guide block 22 is also arranged in the chamber 18 of the handle 10, and mounted for longitudinal sliding movement on the guide blocks 20 and 22 are pawls 24 and 26 respectively. Each pawl is provided with a tongue 28 which is adapted to be projected into the path of movement of the teeth 16 so that when one or the other of the pawls is advanced to its fullest extent, the jaw or socket member 14 will rotate about its axis. Coupled to the pawl 24 is a retractile coil spring 30 and a similar retractile coil spring 32 is coupled to the pawl 26. The opposite ends of the springs 30 and 32 are connected to a retractile coil spring 34 which in turn is anchored as at 36 to the block 22 so that the pawls 24 and 26 will be yieldingly urged inwardly toward the longitudinal axis of the handle 10 and away from the socket jaw member 14 out of contact with the teeth 16. Thus it will be seen that under normal circumstances, the socket jaw member 14 may rotate in the head 12 without moving the handle 10. As illustrated, the pawls 24 and 26 are respectively provided with inwardly off-set extensions 38 and 40 at their ends remote from the tongues 28 which not only serve as guides for the body to be more fully hereinafter described but also to advance the pawls 24 and 26 into engagement with the teeth 16 with the advance of the body.

Mounted in the handle 10 in longitudinally spaced relation to the guide block 22 is a guide block 42, and mounted for longitudinal sliding motion on the guide block 42 is an elongated, substantially U-shaped thrust body 44 which is formed intermediate its ends with a longitudinal slot 46. Extending longitudinally from the end of the body 44 adjacent the head 12 are spaced parallel legs 48 and 50 respectively which straddle the extensions 38 and 40 on the pawls to cooperate with the guide block 22 in holding the pawls in proper longitudinal alignment within the handle. Extending between the guide block 42 and the end of the thrust body 44 remote from the legs 48 and 50 are compression coil springs 52 which serve to yieldingly urge the body 44 longitudinally and away from the head 12 of the handle 10. Carried by the end of the body 44 remote from the legs 48 and 50 is a toothed rack bar forming extension 54.

Pivotally mounted as at 56 on the handle 10 is

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a handle lever 53 carrying a toothed quadrant 60, the teeth of which mesh with the teeth on the rack bar 54 so that as the lever 53 is moved about its pivot 56 toward the handle 10, the thrust body 44 will be advanced against the effort of the springs 52 toward the head 12.

Extending transversely across the body between the legs 48 and 50 adjacent their free ends remote from the head 12 is a guide pin 62, and mounted on said guide pin for movement transversely between the legs 48 and 50 is a slide block 64. This slide block 64 is best illustrated in Figure 7 and comprises a solid body having an opening 66 extending therethrough through which the guide pin 62 extends freely. Formed in one side wall of the slide block 64 is a longitudinal groove 68 for the reception of one end of a shift pin 70 which projects through a transversely extending arcuate slot 72 formed in the handle 10. A shift lever 74 is pivotally coupled as at 76 to the handle 10 on one side thereof and carries the shift pin 70 so that upon moving the shift lever 74 within the confines of the slot 72, the slide block 64 will be moved transversely of the yoke 44 into a position behind one or the other of the extensions 38 or 40 of the pawls 24 and 26 respectively.

In use when it is desired to turn a nut or bolt in a clockwise direction, the shift lever 74 is moved into the position illustrated in Figure 1 to move the slide block 64 into the position illustrated in Figure 2 behind the extension 40 of the pawl 26. With the parts in this position, the lever 53 is advanced toward the handle 10 about the pivot 56, thus causing the quadrant 60 to advance the rack 54 of the body 44 toward the head 12 and by reason of the advance of the body 44 with the slide block 64 behind the extension 40, it will be evident that the pawl 26 will be moved against the effort of the springs 32 and 34 so as to bring its tongue 28 into contact with a tooth of the annular row of teeth 16 of the jaw or socket member 14. In this relationship of the parts, the handle may be oscillated and the wrench will function as a ratchet wrench. By effecting a pumping action of the handle lever 53 the jaw or socket member 14 may be rotated without turning the handle and hence the device may be used in places where oscillation of the handle is impracticable. Should it be desired to rotate the nut or bolt head in a reverse or counterclockwise direction, pressure is released on the handle lever 53 to permit the thrust body to move under the influence of the springs 52 in a direction away from the head 12 so as to thus release pressure on the pawl 26 and permit it to return under the influence of the springs 32 and 34 to its initial position. The shift lever 74 is then moved upwardly as viewed in Figure 1 so as to cause the shift pin 70 to shift the slide block 64 to a position behind the extension 38 of the pawl 24 so that when the body 44 is again advanced by rocking the lever 53 toward the handle 10, the pawl 24 will be advanced against the effort of the springs 30 and 34 and bring its tongue 28 into engagement with a tooth in the annular row of teeth 16 carried by the jaw or socket member 14 and by producing a pumping action of the handle lever 53 the socket or jaw member 14 may be rotated in a counterclockwise direction in the head 12. Obviously so long as pressure is exerted on the handle lever 53 to hold it fully advanced toward the handle 10, the pawl 24 will be held in its fully advanced position, and the pawl 26 will be advanced a distance sufficient to lock the jaw or socket member 14 against rotation in

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the head 12. Obviously as soon as pressure is released on the handle lever 53, the springs 52 will return the body 44 to its original position while the springs 39 and 34 return the pawls 24 and 26 to their initial position.

While in the foregoing there has been shown and described the preferred form of this invention, it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

I claim:

1. A wrench of the character stated comprising an elongate handle having a head on one end and a longitudinal chamber leading to said head, an annular socket member rotatably supported in the head and having an encircling series of teeth exposed in the chamber, guide members in and spaced longitudinally of the chamber, a pair of elongated pawls disposed longitudinally in the chamber on opposite sides of two of said guide members, each pawl including a longitudinally extending forward end tongue for engagement with teeth of the socket member and an inwardly offset longitudinal rear end extension, said pawls being adapted to move longitudinally of the handle and to shift laterally at their forward ends, spring means connecting the pawls together and to a guide member between the pawls, said spring means exerting a constant inward and rearward pull upon the pawls, an elongated thrust body positioned in the chamber for movement longitudinally therein at the rear ends of the pawls, the thrust body including two side portions each adjacent to a pawl extension, a handle lever pivotally supported on the elongated handle, an operative coupling between the handle lever and the thrust body for imparting longitudinal reciprocatory movement to the thrust body, and shiftable means within the chamber for selectively coupling the pawl extensions with the said side portions of the thrust member.

2. A wrench structure of the character stated in claim 1, wherein said shiftable means comprises a slide block disposed between the side portions of the thrust body, a pin extending transversely between and connecting said side portions of the thrust body and passing freely through the slide block, and means carried by the first named handle and operatively coupled with the slide block for moving the slide block on said pin for the said selective coupling of the pawl extensions with the side portions of the thrust member by the block.

3. A wrench structure of the character stated in claim 1, wherein said elongate thrust body is of U-form, the side portions of the body constituting the legs of the U, the said inwardly offset longitudinal rear end extensions of the pawls lying between the free ends of said legs, and the said operative coupling between the handle and thrust body comprising a gear quadrant connected with the handle lever and a toothed rack forming a longitudinal extension of the thrust body with which the quadrant is connected.

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