March 2, 1943. F. LE PIANE 2,312,425

WRENCH

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FIG 1

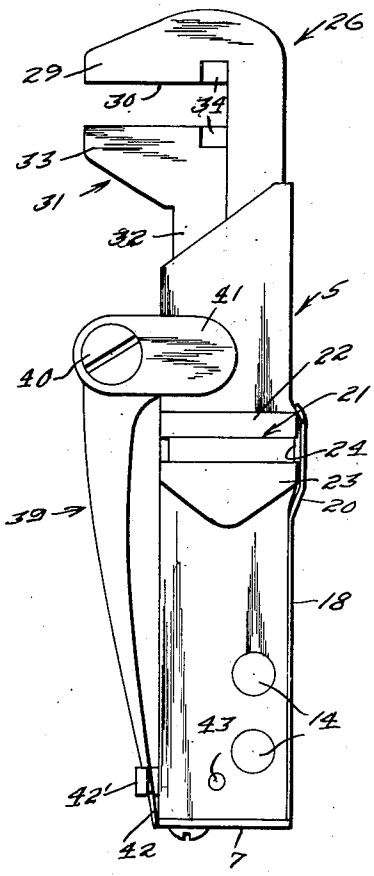


FIG 2

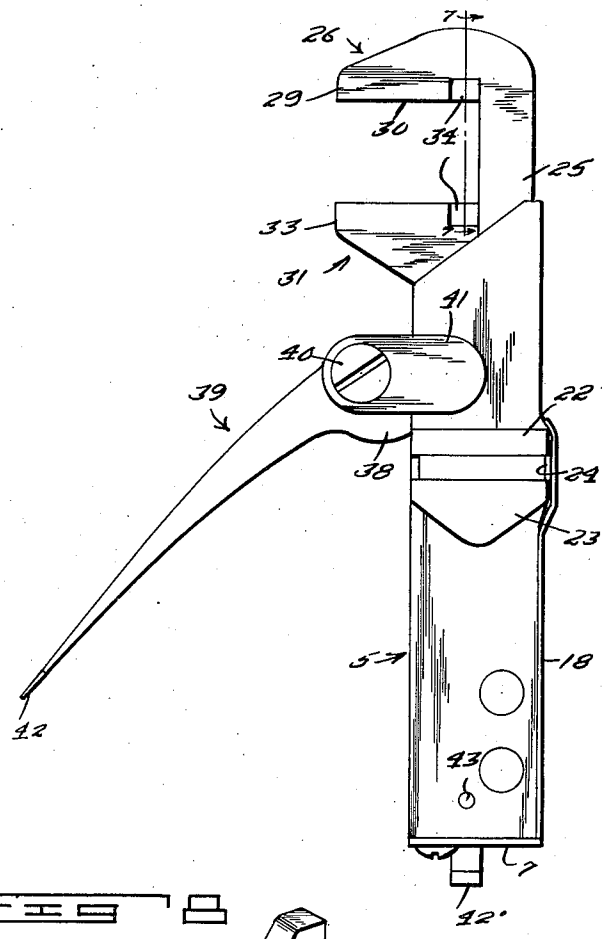


FIG 8

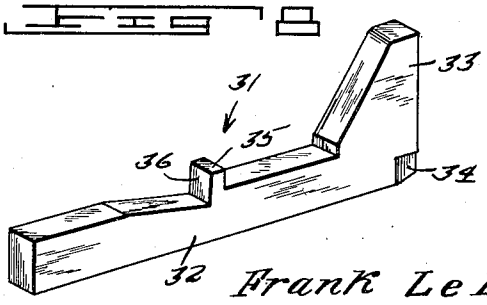
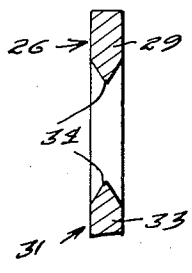


FIG 7



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WRENCH

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FIG 3

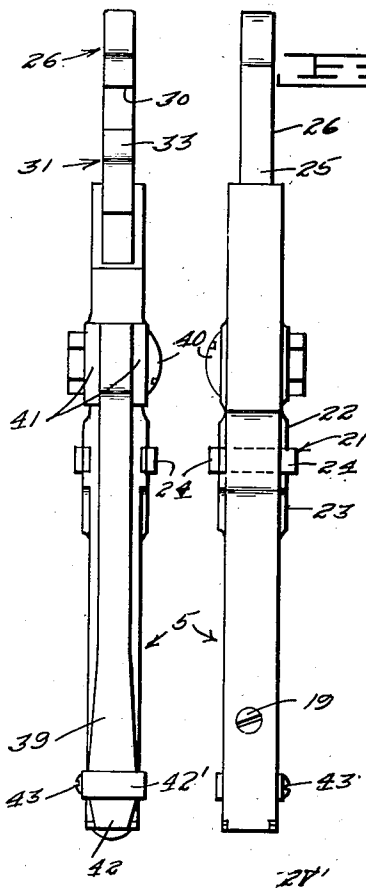


FIG 4

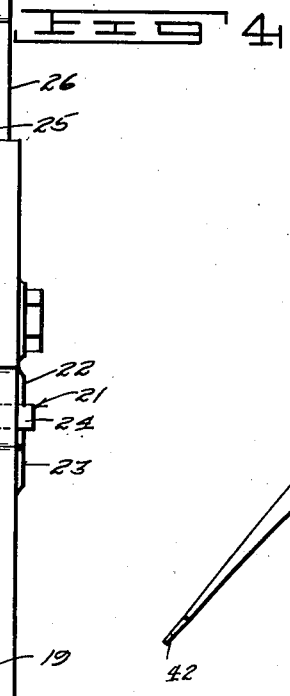


FIG 5

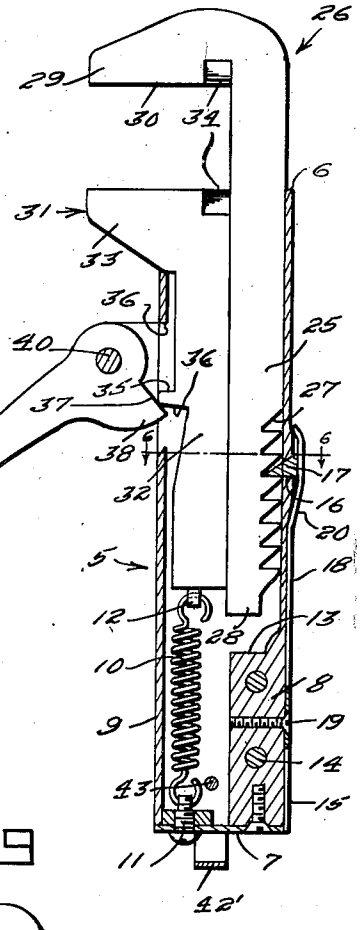


FIG 9

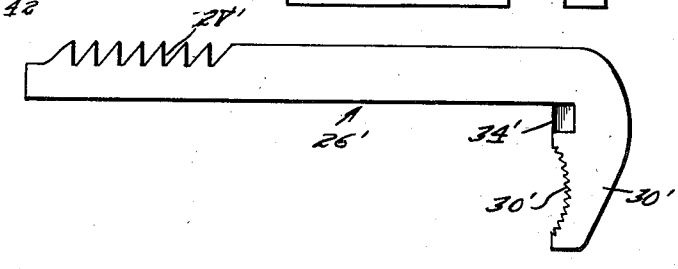
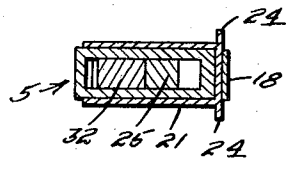


FIG 6



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Patented Mar. 2, 1943 2,312,425

UNITED STATES PATENT OFFICE

2,312,425

WRENCH

Frank LePiane, Roosevelt, N. Y.

Application October 6, 1941, Serial No. 413,845

1 Claim. (Cl. 81—87)

My invention relates to improvements in wrenches, and the primary object of my invention is to provide a quick acting wrench of few and simple parts, and which is easy to manipulate to place the jaws in gripping relation to the work, and to interchange jaws of different contours suitable to particular types of work.

Another important object of my invention is to provide a wrench of the character indicated which involves a minimum of difficultly fabricated metal, and is, therefore, relatively cheap to construct and conserves material.

A further important object of my invention is to provide a wrench of the character indicated which is unusually compact and rugged, and which has other tool functions besides those of a wrench.

Other important objects and advantages of my invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings—

Figure 1 is a side elevational view of the wrench showing the combined operating handle and screw driver in closed position, and with the jaws in relatively closely spaced relation.

Figure 2 is a view similar to Figure 1 but showing the combined handle and screw driver in open position and with the jaws in relatively widely separated position.

Figure 3 is a left hand edge elevational view of Figure 1.

Figure 4 is a right hand edge elevational view of Figure 1.

Figure 5 is a longitudinal vertical sectional view taken through Figure 2.

Figure 6 is a horizontal sectional view taken through Figure 5 along the line 6—6 and looking in the direction of the arrows.

Figure 7 is a fragmentary transverse vertical sectional view taken through Figure 2 along the line 7—7 and looking in the direction of the arrows.

Figure 8 is a perspective view of the movable jaw.

Figure 9 is a side elevational view of a modified form of relatively stationary jaw.

Referring in detail to the drawings, the present device comprises an elongated substantially rectangular casing 5, of substantially rectangular cross section, which can be of relatively thin sheet metal without sacrifice of structural and functional strength, in view of its box section, cross section and the close arrangement of the jaws within the casing to support its sides and prevent its collapse. The casing is open at one end as indicated by the numeral 6 but has a closed bottom 7 at its opposite end. Adjacent the closed end 7 is an interior filler block 8 which is spaced from the edge 9 of the casing to provide a chamber for the movable jaw retracting spring 10 which is anchored as indicated by the numeral 11 to the closed bottom 7 and has its upper end connected at 12 to the lower end of the movable jaw. The upper end 13 of the block 8 is contoured to act as a conforming stop for the lower end of the relatively stationary but adjustable jaw. Transverse rivets 14 secure the block 8 in place in the casing. The casing edge wall 15 opposed to the casing edge wall 9 has an opening 16 intermediate its upper and lower ends to pass the ratchet dog 17 into the casing, the said dog being mounted on a leaf spring which rises along the edge 15 of the casing and is secured in place by a screw 19 threaded into the block 8. The upper part of the spring 18 which carries the dog 17 is outwardly bowed as indicated by the numeral 20. The dog 17 constitutes the bight portion of a U-shaped member whose legs are slidably mounted in grooves on the front and back sides of the casing which are defined by transversely extending longitudinally spaced lugs 22 and 23 projecting outwardly from the sides of the casing. A boss projects from the opposite sides of the said U-shaped element near its bight portion to be engaged by the fingers in deforming the spring 18 outwardly to withdraw the dog 17 from engagement with the ratchet teeth on the stationary jaw.

The jaws are of shapes which are contoured and sized to slide in edge to edge relation and bear against the sides of the casing 5 in mutually supporting relation and without unnecessary looseness. The shank 25 of the relatively stationary jaw which is generally designated 26, is rectangular in cross section and has the ratchet teeth 27 on the lower part of its outer edge, for cooperation with the ratchet dog 17 already described. The lower end of the shank 27 is contoured as indicated by the numeral 28 to cooperate with the stop surfaces 13 on the upper part of the block 8. The outer edge of the shank 25 has a laterally extending jaw 29 which may have a rectangular plain working face 30 or a serrated or other contoured working face such as that indicated by the numeral 30′ in Figure 9, in accordance with the work to be handled. To adjust the jaw 26 to a desired relatively station-

ary position in the casing 5 it is only necessary to push or pull on the bosses 24 to force the dog 17 out of engagement with the teeth 27, and move the jaw 26 to the desired position accompanied by release of the dog 17 to reengage the corresponding one of the ratchet teeth 27, whereupon the relatively stationary jaw is locked in its new position and cannot move in either direction.

The movable jaw which is generally designated 31 has a rectangular cross section shank 32 which bears against the inner surfaces of the sides of the casing 5 and against the adjacent edge of the shank of the jaw 26 and at the upper end of the shank 31 has a plain or other suitably shaped laterally projecting jaw 33 companion to the jaw 30. If desired the companion jaws have cooperating wire cutting formations 34.

The outer edge of the shank 32 of the jaw 31 is substantially plain and straight except for an outwardly projecting lug 35 which acts as the limit stop to engage either the upper or the lower end of the opening 36 formed in the wall 9 of the casing 5, to limit longitudinal adjustment of the jaw 31. The under-surface of the lug 35 also acts as an abutment, under which is a further indented surface 36, for operative engagement by the substantially plain working surface 37 on the lateral cam 38 on the head of the combined operating lever and screw driver which is generally designated 39, the said head being concentrically pivoted by a bolt 40 to and between ears 41 projecting outwardly from the wall 9 of the casing alongside a portion of the opening 36. The lever or operating handle 39 is outwardly tapering in form and provides a screw driver extremity 42 for use in turning screws or studs with the casing 5 held in the hand in a manner of a corkscrew handle.

The spring 10 normally keeps the movable jaw 31 in a retracted or depressed position, with the consequence that the normal position of the handle 39 is the extended one illustrated in Figures 2 and 5 of the drawings. It is believed obvious that compressnig the handle 39 toward the casing 5 by means of the fingers, with the wrench as a whole held in the hand, the effect of the movement of the handle will be to push the jaw 31 toward the jaw 26 and cause the jaw elements 30 and 33 to approach each other in work gripping relation, or to cause the elements 30 and 33 to approach each other until the wire cutting formations 34 come into cooperative action; and that the jaws will be held in the desired operative positions as long as the handle 39 is held in the contracted position, and then with the jaws properly adjusted relative to each other and to the work, the clamping action on the work may be determined by the amount of compression of the handle 39. As soon as the handle 39 is released the spring 10 operates to swing the handle to the open inoperative position and withdraw the jaw 31 from the work and away from the jaw 26.

A bail retainer 42 pivoted on the opposite sides of the lower part of the casing 5 as indicated by the numeral 43 may be swung into the position illustrated in Figures 1 and 3 to embrace the outer end of the handle 39 in the compressed position of the handle, when the wrench is not in use.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not wish to limit the application of my invention thereto, except as may be required by the scope of the subjoined claim.

Having described the invention, what is claimed as new is:

A wrench comprising an elongated flat transversely rectangular casing having an open end and a closed end, and an elongated longitudinal slot in one edge thereof, a pair of jaw members having flat shanks extending into said open end of the casing and relatively slidable in edge-to-edge engaging relation therein inwardly and outwardly of said open end, respectively, into different positions, detent means for releasably holding one shank in different positions, a spring in said casing having its ends fastened to the inner end of the other shank and to the closed end of the casing, respectively, in the line of movement of said other shank and tensioning said other shank against outward sliding, and means to slide said other shank outwardly in opposition to said spring comprising a lateral edge lug on said other shank extending into the slot in said one edge of the casing flush with said edge, a pair of opposed ears extending from said one edge of the casing at opposite sides of said slot, a cam pivoted between said lugs and having a handle and a radial shoulder rotatable into said slot into camming engagement with said lug.

FRANK LE PIANE.