

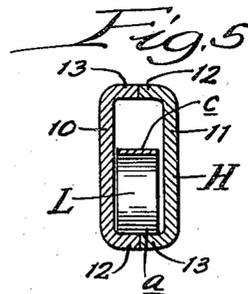
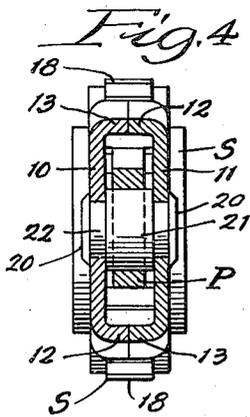
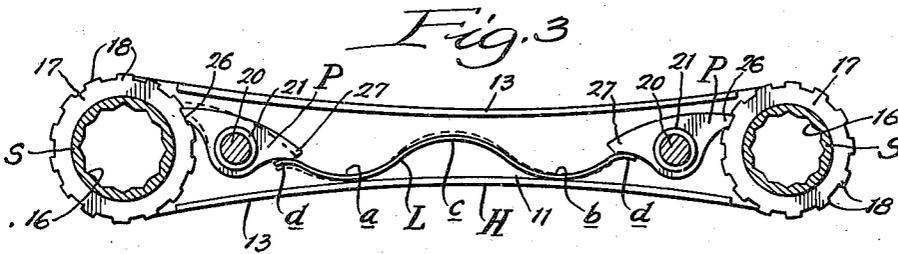
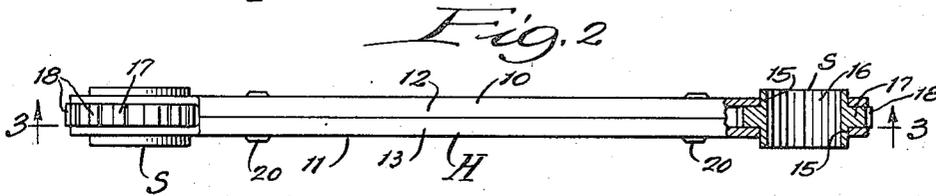
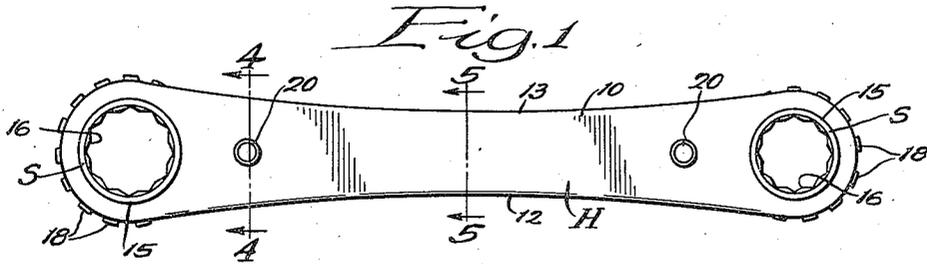
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E. SCHULTZ

2,421,038.

WRENCH

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## UNITED STATES PATENT OFFICE

2,421,038.

## WRENCH

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Application June 9, 1944, Serial No. 539,425

1 Claim. (Cl. 81-61)

1.

The present invention relates to a wrench of the type which utilizes a rotatable double-ended work-engaging socket together with a ratchet-pawl mechanism for confining the rotary movements of the socket to one direction.

In the embodiment herein illustrated, the wrench comprises an elongated chambered handle mounting near each end thereof a rotatable work engaging socket, each preferably of a different size. Each socket is open through from end to end so as to receive from either end the nut or bolt head which is to be engaged. Where the movement to be imparted to the work is in a clockwise direction, the appropriate end of the socket is used; and for a reverse movement, the opposite socket end may be engaged with the work. In this way it is unnecessary to provide for reversing the action of the pawl-ratchet mechanism.

For its objects my invention aims to provide a wrench of this general character which may be produced at small expense, which will be strong and durable for the accomplishment of its intended purpose, which will comprise a minimum number of parts to facilitate assembly, which utilizes a single, easy acting spring in operative engagement with both pawl-ratchet mechanisms, and which will afford not only a protecting enclosure for the operative parts but also a comfortable and convenient grip for the hand when the wrench is to be manipulated.

These and other objects of my invention may be realized from a construction of which a suggestive embodiment is illustrated in the accompanying drawing in the manner following:

Figure 1 is a top elevational view of the wrench in its entirety;

Fig. 2 which is a side elevation of the wrench, is broken away in one end region to exhibit a sectional view thereof;

Fig. 3 is a horizontal section taken on line 3-3 of Fig. 2; and

Figs. 4 and 5 are transverse sections taken, respectively, on lines 4-4 and 5-5 of Fig. 1.

The body of the wrench which forms the handle H comprises two companion plates 10 and 11, each having along opposite sides flanges 12 and 13 extending toward the other for meeting engagement therewith. As shown, the handle is preferably bowed inwardly from each end to a region of minimum width in the center, and the flanges which define the edges of the handle are rounded over at their point of juncture with the handle plates. In this way the wrench contour is rendered convenient and comfortable for seizure and manipulation.

The flanges 12 and 13 terminate short of each end of the wrench handle where I provide in the two plates 10 and 11 registering openings 15 constituting a pair of bearings for a work-engaging

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socket S which will presently be described. As shown, two such sockets are provided, one at each end of the wrench. Preferably the internal size of one socket differs from that of the other whereby to adapt the wrench for engagement with nuts or bolts of different size.

Each work-engaging socket which is open at both ends is rotatably mounted in each pair of bearings. As shown, each socket is formed interiorly with serrations or teeth 16 for operative engagement with a nut, bolt head, or other device which is to be gripped. Exteriorly between its two ends, each socket is formed with an outstanding band 17 having teeth 18. This band which constitutes, in effect, a ratchet is so disposed as to lie in part between the flanges of the two handle plates and to afford an end closure for the chamber therebetween. Because of its exposed position at the wrench end, the band may be engaged by the fingers to rotate the socket to a desired position.

The companion plates forming the handle wrench may be secured together in any appropriate way as, for example, by a pair of rivets 20 one relatively close to each end of the wrench. As shown, each rivet is enlarged at 21 intermediately of its ends to provide a stud 22 having opposed shoulders against which the handle plates 10 and 11 may rest when their flanges 12 and 13 are substantially in meeting engagement. The rivet ends are upset or spread in the usual way to lock the handle plates against separation.

The intermediate stud portion of each rivet is disposed within the handle chamber to afford a pivotal mounting for a pawl P having an acting end 26 in operative engagement with the proximate ratchet band. The opposite pawl end is formed with a heel 27 receiving engagement from one end of a leaf spring L which extends lengthwise of the handle between the two pawls. As shown, this spring is of undulating contour to provide two curved portions a and b in point engagement with the flanges 12 and 13 along one side of the wrench handle. Between these two curves is a reverse curve c which is disposed toward the opposite side of the wrench handle. The ends d of the spring are preferably turned for face engagement with the heels of the pawls. A spring of this character, when fitted in place within the handle chamber and in operative engagement with the two pawls, is maintained under tension so as to hold each pawl in operative engagement with its associated ratchet band.

In operation, the socket of appropriate size is fitted over the work, and the wrench handle is then oscillated (or rotated completely) to transmit a desired forward motion to the socket and to the work. The wrench is also free to execute a reverse movement without rotation of the socket, the pawl ratchet mechanism being in-

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effective during such a stroke. In this reverse movement the pawl, which is yieldingly held in engagement with the ratchet band, is free to slide over its teeth to occupy another and different position relative to the ratchet. In this movement the pawl is required to rock upon its pivot, i. e., the rivet stud 22, against the tension of the spring L. When this takes place, the spring curves are deflected somewhat as indicated by the dotted lines in Fig. 3. It will be noted that this deflection changes the shape of the spring throughout substantially its entire length, and that the spring for substantially its entire length is effective to exert its tension force against each pawl only one of which is rocked at a time. This makes for easy and dependable pawl action.

A wrench answering to this description may be produced as to most of its parts by stamping operations. It requires but two securing rivets each of which serves as a stud whereon one of the pawls is mounted. I employ but a single spring which requires no fastening or securement other than that which is afforded by its loose engagement with one of the handle walls and with the two pawls with which it is operatively engaged and by which it is confined against end-wise movement. In all these respects the wrench has the advantage of extreme simplicity and its production and assembly may, in consequence, be attained with a minimum of effort and expense.

I claim:

A wrench comprising a hollow handle having an interior chamber and provided at both ends with transversely aligned bearings, transverse fastening devices located adjacent said bearings,

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a pair of open-ended work engaging sockets journaled in said bearings and provided intermediate their ends with ratchet bands having teeth, a pair of short pawls pivoted intermediate their ends on said fastening devices and consisting of an outer tooth-engaging portion and an inner heel, and a long leaf spring arranged within the chamber of the handle and of a width approximately that of the chamber and extending lengthwise of the handle from one pawl to the other, and consisting normally of an upwardly bowed central portion and end portions extending from the central bowed portion and arranged at an inclination and having their terminals bearing against the heels of the pawls at the lower surfaces thereof, said spring being retained in operative position solely by said pawls and the walls of the casing and maintaining the pawls in engagement with the ratchet teeth.

EDWARD SCHULTZ.

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