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S. MANDL

WRENCH

Filed Feb. 1, 1924

FIG. 1.

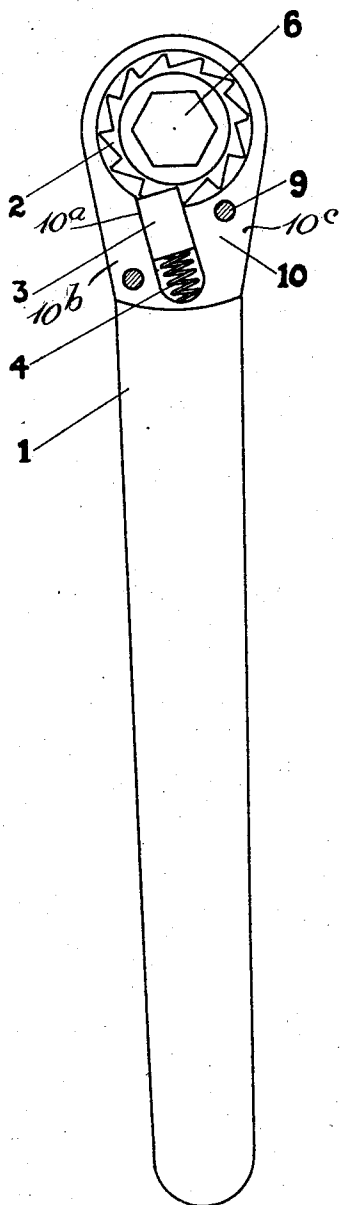
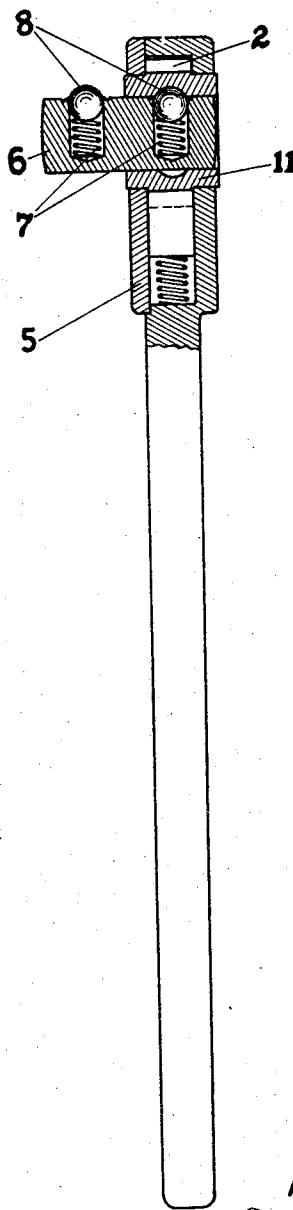


FIG. 2.



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UNITED STATES PATENT OFFICE.

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WRENCH.

Application filed February 1, 1924. Serial No. 689,912.

This invention relates to wrenches and is particularly directed to a ratchet wrench.

Ratchet wrenches, as heretofore constructed, have not proven wholly satisfactory primarily for the reason of the frail nature of the pawl and ratchet construction. This weakness is not due, in the usual type of wrenches, to merely the sides of the parts, but is due inherently to a weakness incidental to the principle along which the wrench is designed. In other words, the usual ratchet wrenches transmit the force from the ratchet wheel to a pivotally mounted pawl and this force is carried longitudinally of the pawl and transmitted to the pivotal support. This necessarily is an inherently weak construction.

This invention is designed to overcome the above noted defects and objects of such invention are to provide a ratchet wrench which is so constructed that the force from the ratchet wheel is not transmitted longitudinally of the pawl but transversely thereof and is directly transmitted from the pawl to the body portion of the wrench, and to provide a ratchet wrench in which a pivotal mounting for the pawl is wholly avoided.

Further objects are to provide a ratchet wrench which utilizes a bodily movable rectilinearly reciprocable pawl, and in which the pawl is directly guided and mounted in the body portion of the wrench, thus avoiding any fragile construction.

An embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is a face view of the wrench with the cover plate removed.

Figure 2 is a side view partly in section of the structure shown in Figure 1.

The wrench comprises a handle 1 having a body portion 10 which may conveniently be slightly larger than the normal size of the handle, as shown in the drawing. This body portion is provided with a circular aperture therethrough within which is mounted a revoluble member 11 having a set of ratchet teeth 2 on its peripheral portion and thus constituting a ratchet wheel. This ratchet wheel or revoluble member may engage the work in any desired manner. For example, a plug 6 of hexagonal cross section may slidably fit a correspondingly shaped aperture in the ratchet wheel.

Further the plug 6 may conveniently be provided with a pair of balls 8 pressed out-

wardly by means of socketed springs and adapted to seat within recesses in the ratchet wheel so that the plug may project from either side of the wrench if desired. The pawl 3 consists of a rectangular block of sturdy construction which is mounted within a slot formed in the body portion and is outwardly pressed by means of a helical spring 4 seated within the slot and bearing against the outer end thereof. This slot is arranged in a somewhat tangent manner to the ratchet wheel, that is to say, the pawl is adapted to bodily reciprocate along a straight line, such that the line of pressure from the ratchet wheel, when in locked position, is approximately at right angles to the line of reciprocation to the pawl. This construction insures the direct transmission of the force from the ratchet wheel transversely through the pawl to the body portion, and provides, therefore, the maximum or strength. The body portion on one side of the wrench is separated by the pawl slot, designated 10^a, into the opposite side portions 10^b and 10^c.

If desired, the body portion may be provided with a cover plate 5 held in position by a pair of screws 9.

It will be seen, therefore, that a ratchet wrench has been provided in which a rectangular reciprocable pawl is provided and is adapted to receive the force from the ratchet wheel along a line at right angles to its line of reciprocation and to directly transmit this force to the body portion.

It will further be seen that the actual mechanical construction by which these results are attained are extremely simple and that therefore, the wrench may be cheaply manufactured.

Although the invention has been described in considerable detail, it is to be understood that the invention may be variously embodied and is, therefore, to be limited only as claimed.

I claim:

1. In a ratchet wrench, the combination of a body portion comprising a handle having an integral head provided with a ratchet pocket opening laterally from one side of the head and provided with an angular pawl recess disposed in the longitudinal median line of the handle, said recess opening at one end into the ratchet pocket with one side of the recess opening laterally from

one side of the body portion and separating the body portion on one side of the wrench into side portions on opposite sides of the pawl recess, a ratchet mounted in said pocket, the periphery of the outer end of the head conforming with the ratchet pocket and forming a thin imperforate wall serving only to confine the ratchet, a generally rectangular spring pressed pawl mounted in the pawl recess for cooperation at its outer end with the ratchet and removable laterally independently of the ratchet, a plate mounted over the lateral open side of the pawl recess and having a thin imperforate ring-like portion surrounding the thin pawl confining wall at the outer end of the head for retaining the pawl and ratchet against lateral displacement, said plate bridging the sides of the body portion separated by the pawl recess and fastening devices inwardly only of the outer thin wall of the head and adjacent part of the plate and on opposite sides of the pawl recess for tying the body portion on opposite sides of the pawl recess together through the plate and for securing the plate to the head.

2. In a wrench, a body portion having a handle, a ratchet having a plurality of teeth, there being a laterally opening pawl recess

intermediate the handle and the ratchet, said pawl recess being disposed in a substantially longitudinal position with respect to the wrench, a substantially rectangular pawl mounted in said recess, said pawl having an end at right angles to its side faces for engaging the teeth of the ratchet, each of the teeth of said ratchet having a holding edge disposed at substantially right angles to a slanting edge of an adjacent tooth, the said end of the pawl being adapted to fit relatively tight in the right angles thus formed by the teeth of the ratchet, the body portion having a thin imperforate wall surrounding the ratchet at the outer end of the wrench and a plate-like portion for retaining the said ratchet and covering the lateral open side of the pawl recess to retain the pawl, said plate-like portion being secured to the intermediate body portion on opposite sides of the pawl recess for strengthening the wrench at this place and for preventing deformation thereof.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

SIGMUND MANDL.