

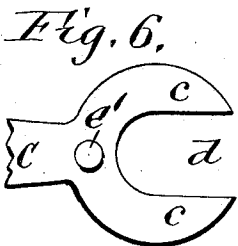
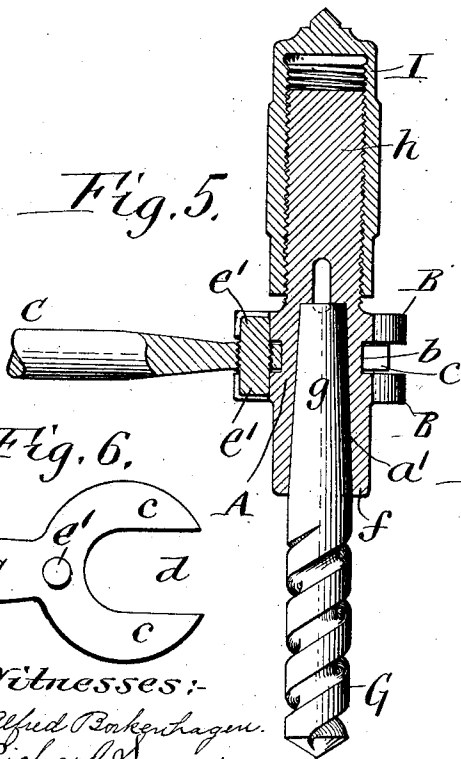
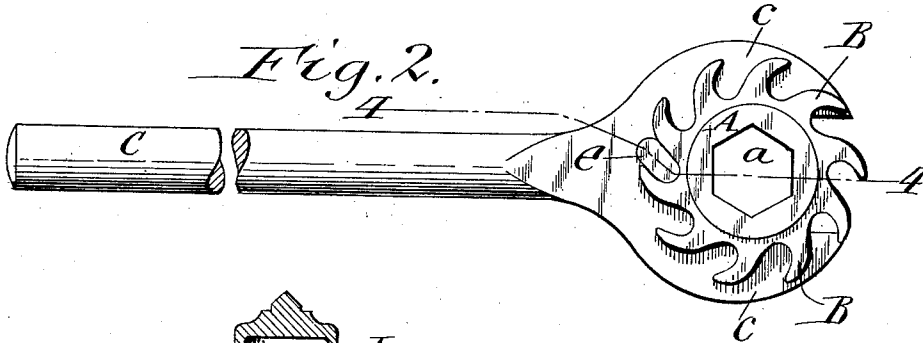
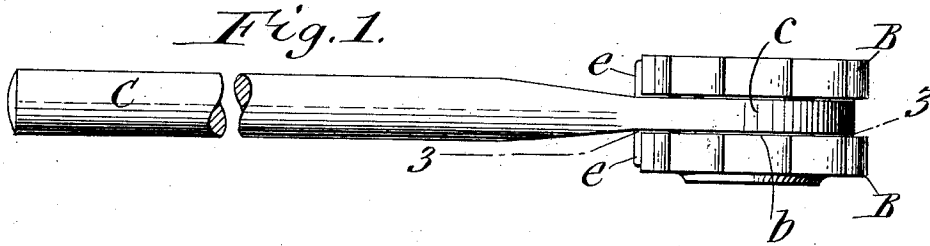
T. BROCKLEBANK.

RATCHET.

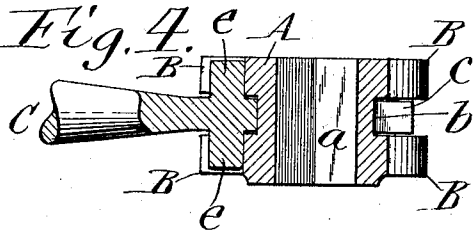
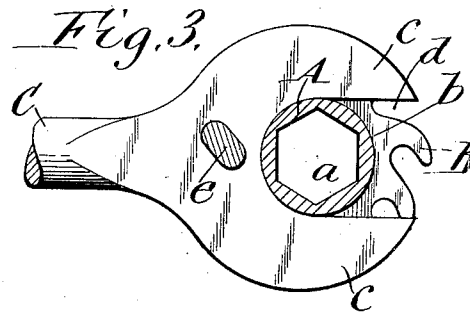
APPLICATION FILED JAN. 16, 1911.

1,063,770.

Patented June 3, 1913.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS BROCKLEBANK, OF BUFFALO, NEW YORK.

RATCHET.

1,063,770.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed January 16, 1911. Serial No. 602,832.

To all whom it may concern:

Be it known that I, THOMAS BROCKLEBANK, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Ratchets, of which the following is a specification.

This invention relates to a ratchet which is more particularly designed for use in operating wrenches or drills by hand although it is also useful for other purposes.

It is the object of this invention to provide a hand operated ratchet which is very simple in construction, which is composed of a minimum number of parts capable of being produced at comparatively low cost, which is not liable to get out of order and which can be readily reversed when embodied in a wrench, so as to permit of either tightening or loosening the parts operated upon.

In the accompanying drawings: Figure 1 is a side elevation of a ratchet wrench embodying my improvements. Fig. 2 is a bottom plan view thereof. Fig. 3 is a horizontal longitudinal section in line 3—3, Fig. 1. Fig. 4 is a vertical longitudinal section taken in line 4—4, Fig. 2. Fig. 5 is a vertical section showing my improved ratchet embodying a hand operated drill brace. Fig. 6 is a plan view showing a modification in the construction of the coupling pin on the handle.

Similar letters of reference indicate corresponding parts throughout the several views.

Referring to Figs. 1-4, A represents a hub or body which may be provided with any suitable means for connecting the same with the article or part to be turned. As shown in the drawings, these means consist in providing the hub with a hexagonal socket *a* which is adapted to receive a correspondingly shaped screw nut, bolt head or other part to be turned. On its periphery the hub is provided with two annular rows of ratchet teeth B, these rows being separated from each other by an intervening annular groove or channel *b*. Each of the ratchet teeth may be variously constructed but the same preferably has a convex inclined or outwardly bulging front side and a receding, concave or undercut rear side, so that each tooth has generally the shape of a hook, as best shown in Fig. 2. C represents a handle which is provided at its front

end with a fork or bifurcation, the prongs *c* of which are of such thickness that they can enter the annular groove *b* between the rows of teeth on the hub, and the gap or notch *d* between the prongs being of sufficient width to permit these prongs to receive the hub between them. *e, e* represent two coupling pins projecting laterally from opposite sides of the handle and each adapted to engage with the ratchet teeth on one end of the hub. These coupling pins may be of any suitable shape but are preferably constructed of oblong form, the long sides of which are parallel and arranged tangentially with reference to the axis of rotation of the ratchet, so as to present a large bearing surface to the teeth of the ratchet hub, thereby reducing the wear of these pins and prolonging the life of the tool.

In using this ratchet wrench the socket-shaped hub is applied to the nut, bolt head or similar part to be turned and the fork of the handle is engaged with the groove of the hub and oscillated by hand. During the forward movement of the handle its coupling pins engage with the concave rear sides of a pair of ratchet teeth, whereby the handle is drawn toward the hub and held reliably in engagement therewith and the hub is compelled to turn with the handle together with the part to which the hub is applied. Upon moving the handle backwardly its coupling pins slide outwardly on the convex or inclined front sides of the next rearward pair of ratchet teeth until they clear the outer ends of these teeth and then drop into the spaces between these teeth and the next following teeth, thereby causing the coupling pins to be engaged with the pair of teeth in front of the same, ready for advancing the hub another step. When it is desired to turn the part which is being operated in the opposite direction the hub is removed therefrom and reapplied thereto in a reversed position. The forked handle is also applied thereto and operated in a reverse direction for causing the hub to turn in the opposite direction together with the part seated in its socket. By this means this ratchet wrench may be used for tightening a nut or bolt or loosening the same by simply engaging one end or the other of the socket-shaped hub and moving the forked handle back and forth in the same way in both cases.

The hub and the two rows of teeth thereon

may be formed in any suitable way but these parts are preferably formed integrally by casting, forging or machining the same out of a single piece of metal, thereby producing
 5 an exceedingly strong article which is not liable to be broken and which can withstand the roughest usage to which the same is liable to be subjected. The handle and its coupling pins are also preferably constructed
 10 of a single piece, as shown in Fig. 4, by casting or forging the same, but if desired the pins may be made separate from the handle and constructed of a round or cylindrical rod which is screwed into an opening
 15 in the handle, as shown at e^1 in Figs. 5 and 6 or otherwise detachably secured to the same. This last mentioned construction renders it possible to remove the coupling pins when worn out and replace them by new pins
 20 without necessitating renewal of the handle. If desired, one of the rows of teeth on the hub and one of the coupling pins of the handle may be omitted but it is advantageous to employ both rows of teeth and both
 25 coupling pins inasmuch as the same afford a better means of guiding the handle on the hub and also enable the handle to obtain a better hold on the hub as well as making the tool more convenient in use.
 30 For the purpose of adapting my improved ratchet for use in a ratchet drill brace, as shown in Fig. 5, the hub A^1 is provided on one side with an extension f and with a tapering socket a^1 which is adapted to receive
 35 the tapering shank g of a drill G or similar tool, and the opposite end of the hub is provided with an externally screw threaded shank h which receives an internally screw threaded adjusting sleeve I . In using this
 40 ratchet brace the drill is engaged with the article to be bored and the adjusting sleeve is engaged with an abutment which takes

the thrust of the drill. As the boring progresses the adjusting sleeve is turned so as to advance the drill and takes up for the
 45 increasing depth of the opening in the same measure as the same is being bored. This ratchet device permits of using the wrench or the brace either vertically or horizontally or at any other desired angle or position. 50

Owing to the comparatively few parts in this ratchet, the same containing but two pieces in the case of the ratchet wrench shown in Figs. 1-4, it can be produced at comparatively low cost and can be carried
 55 about more conveniently by reason of its comparatively small weight, thereby rendering the same particularly desirable for use by plumbers and others who require a compact and light kit of tools. Furthermore, 60 one handle can be used for a plurality of different kinds of sockets which are adapted for different sizes or shapes of nuts and bolts, thereby minimizing the number of parts for use in a certain range of work. 65

I claim as my invention:

A ratchet comprising a hub provided with an annular row of teeth each of which is of hook form and provided with a convex front side and an undercut or concave rear side, 70 and a handle having a fork the prongs of which straddle said hub and also having a laterally projecting pin which is adapted to engage successively with the convex and concave sides of each of said teeth upon oscillating said handle and pressing the same toward said hub. 75

Witness my hand this 14th day of January, 1911.

THOMAS BROCKLEBANK.

Witnesses:

F. H. BURNETT,
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