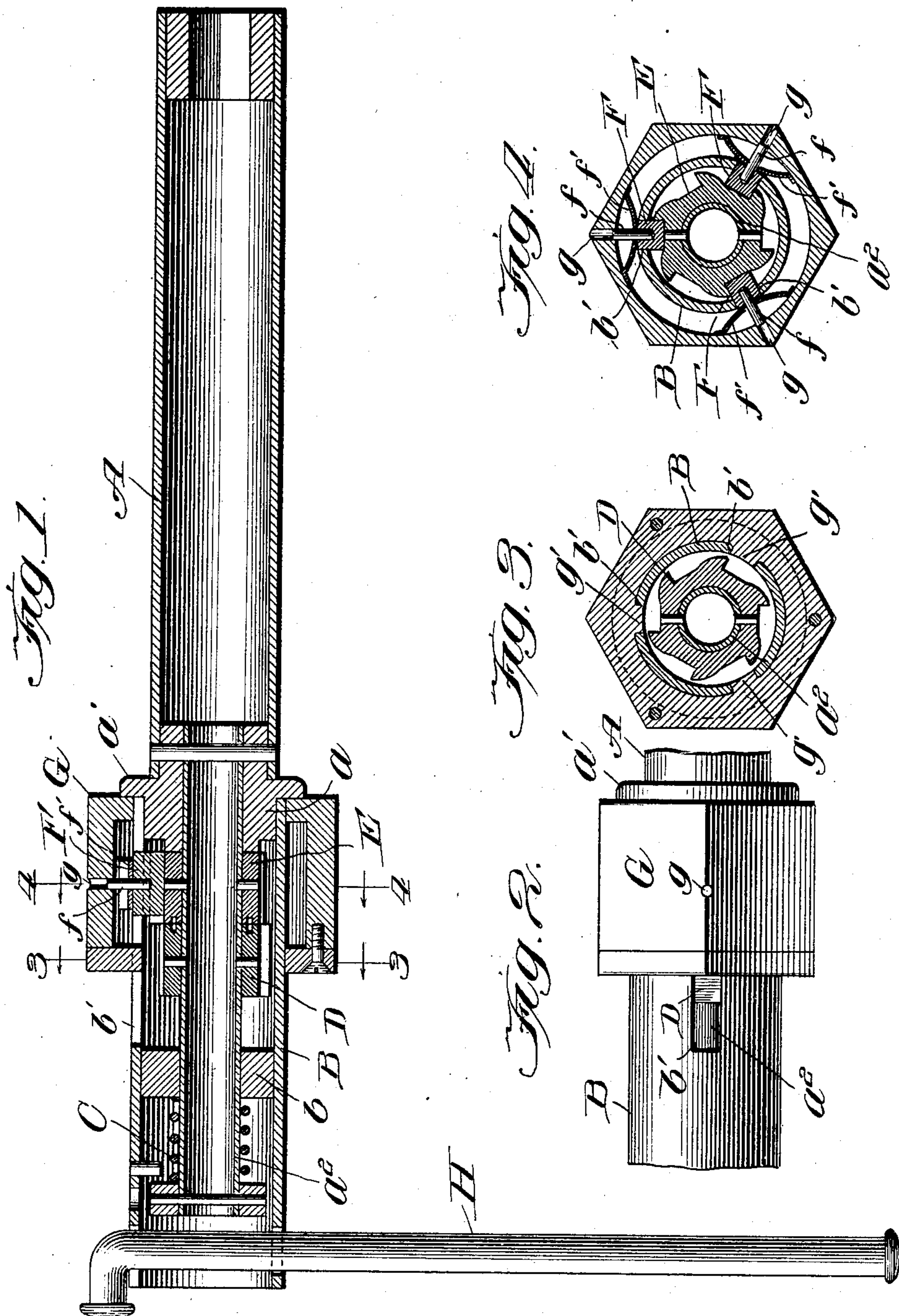


No. 897,772.

PATENTED SEPT. 1, 1908.

E. R. PACKER.
RATCHET TOOL.

APPLICATION FILED JUNE 17, 1907.



Witnesses:

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RATCHET-TOOL.

No. 897,772.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed June 17, 1907. Serial No. 379,323.

To all whom it may concern:

Be it known that I, EBEN RAY PACKER, citizen of the United States, residing at Chicago Heights, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Ratchet-Tools, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to ratchet tools, and has for its object to improve the construction and operation of the same.

A further object of my invention is to provide a tool which can be operated step by step in either direction by oscillating the handle back and forth without necessitating the use of a handle which is required to move axially of the tool during the operation thereof.

A further object of my invention is to provide a ratchet tool which shall consist of but few parts which are constructed and assembled in such a manner that the tool as a whole is compact in construction and can be subjected to rough usage without producing any disarrangement of its parts.

The various features of novelty which characterize my invention will be hereinafter particularly pointed out in the claims, but for a full understanding of my invention, and of its various objects and advantages reference is to be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a longitudinal central section of a wrench arranged in accordance with a preferred form of my invention; Fig. 2 is a side elevation showing a portion of the wrench; and Figs. 3 and 4 are sections taken on lines 3—3 and 4—4 of Fig. 1.

The tool illustrated in the drawing as having my invention applied thereto is in the form of a wrench, but it will, of course, be understood that my invention is not limited in its application to wrenches but may be used wherever it is desirable to transform an oscillatory motion of one member into a step by step movement of another member in either of two opposite directions.

Referring to the drawing, A represents the body portion or stem of a wrench (or other tool, as the case may be) and B represents a

handle portion. The handle is made tubular and fits snugly about the cylindrical portion *a* of the member A. An annular flange *a'* projecting laterally from the member *a* forms a seat for the end of the handle. The handle may be held upon this seat in any suitable way in order to hold it against axial movement on the body portion. This is conveniently accomplished by extending an auxiliary stem *a*² into the handle and placing between this auxiliary stem and a shoulder *b* within the handle, a spring C which is so arranged that it forces the handle positively against the seat. This arrangement is a very satisfactory one for the reason that any wear between the handle and the seat on the stem is taken up by the spring and looseness of the handle is thereby avoided. At the same time the handle may be rotated freely upon the stem.

In order that an oscillation of the handle may effect a step by step rotation of the stem in either direction, I mount on one of these members a double ratchet wheel, and on the other member a pawl; the parts being so arranged that the pawl may be brought into operative relation with either of the ratchet devices. I prefer to make the ratchet devices in the form of ratchet wheels D and E which are rigidly secured to the stem in such a manner as to be housed within the handle. The ratchet wheels may conveniently be secured to the auxiliary stem *a*² in any suitable manner. When the ratchet wheels are carried upon the stem, the pawl or pawls F are mounted upon the handle in such a manner that they are held against rotation thereon, but are free to be moved lengthwise of the handle so as to be brought into engagement with either or both of the ratchet wheels. In the drawing I have illustrated three such pawls, each being mounted to slide within a slot *b'* in the handle.

In order to move all of the pawls simultaneously, a collar G surrounding the handle is provided. This collar has a number of openings *g* arranged to register with the slots *b'* in the handle and the pawls are provided with pins or projections *f* which extend into and are guided by the openings in the collar. Springs *f'*, which may conveniently be made in the form of leaf springs, are arranged between the interior of the collar and the several pawls. These springs not only yieldingly hold the pawls in engagement with the

ratchet wheels, but they serve also to frictionally hold the collar in any position into which it is moved by reason of the engagement between the inner faces of the pawls
5 and the ratchet wheels.

It will be seen that by sliding the collar back and forth the pawls are carried into engagement with first one and then the other of the two ratchet wheels, or if desired,
10 the pawls may be held in engagement with both ratchet wheels at the same time. When the pawls occupy one extreme position, an oscillatory movement of the handle will cause the stem to be rotated step by step in
15 one direction, and when the pawls occupy their other extreme position, a corresponding oscillation of the handle will produce a step by step rotation of the stem in the opposite direction. On the other hand, when the
20 pawls occupy an intermediate position so that they engage with the teeth on both of the ratchet wheels, the handle is locked against rotation on the stem, and the handle and stem may therefore be rotated in one
25 direction or the other as one rigid structure.

In order to steady the pawls and prevent them from being cramped in the slots in the handle, the collar is preferably provided with lugs *g'* which fit within the slots *b'* in the
30 handle. By this arrangement each pawl is supported at two points, namely directly at the handle and at the outer ends of the pins *f*. If desired some means, such as a lever *H* may be provided for turning the handle; but
35 this is, of course, not essential.

It will be seen that my improved tool is extremely simple in construction, and embodies but few parts which are assembled in such a manner that the ratchet devices are
40 entirely housed within the handle and are therefore protected against injury by reason of contact with external objects. Furthermore, there are no delicate parts which are apt to get out of order or out of adjustment.

45 Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an instrument of the character described, a pair of connected members rotatable relatively to each other, a pair of reversely-arranged ratchet wheels on one member, a single-ended pawl on the other member adapted to cooperate with the ratchet wheels, the arrangement being such that the
50 pawl may be brought into operation relative with either of said ratchet wheels.

2. In an instrument of the character described, a pair of connected members rotatable relatively to each other, a pair of reversely-arranged ratchet wheels on one member, a single-ended pawl on the other mem-
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ber adapted to cooperate with the ratchet wheels, the arrangement being such that the pawl may be brought into operative relation with either or both of said ratchet wheels. 65

3. In an instrument of the class described, a stem, a handle revolubly mounted on said stem, a pair of reversely arranged ratchet wheels on the stem, and a single-ended pawl secured to said handle in such a manner that
70 it may be moved into engagement with either of said ratchet wheels.

4. In an instrument of the class described, a stem, a handle revolubly mounted on said stem, a pair of reversely arranged ratchet
75 wheels on the stem, and a pawl secured to said handle in such a manner that it may be moved into engagement with either of said ratchet wheels or with both of said ratchet wheels simultaneously. 80

5. In an instrument of the class described, a stem, a handle revolubly supported on said stem, a pair of reversely arranged ratchet wheels on said stem, a single-ended pawl, and guides on the handle for securing the pawl to
85 the handle so as to be free to be moved into engagement with either of said ratchet wheels.

6. In an instrument of the character described, a stem, a handle revolubly supported
90 on the stem but held against axial movement therein, a pair of reversely-arranged ratchet wheels fixed to the stem within the handle, and a pawl supported upon the handle so as to be held against rotation thereon, and to be
95 slidable axially of the handle into engagement with either of said ratchet wheels.

7. In an instrument of the character described, a stem, a handle revolubly supported on the stem and engaging at one end with a
100 seat on the stem, a spring for holding the handle on said seat, a pair of ratchet wheels on the stem within the handle, and a pawl slidably mounted on the handle so as to be capable of being moved into operative rela-
105 tion to either of the ratchet wheels.

8. In an instrument of the character described, a pair of connected members rotatable with respect to each other, a sliding collar mounted on one of said members so as to be
110 held against rotation thereon, a device having reversely-arranged ratchet teeth, and a pawl device, one of said devices being carried by said collar and the other being mounted on the second of said members. 115

In testimony whereof, I sign this specification in the presence of two witnesses.

EBEN RAY PACKER.

Witnesses:

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