

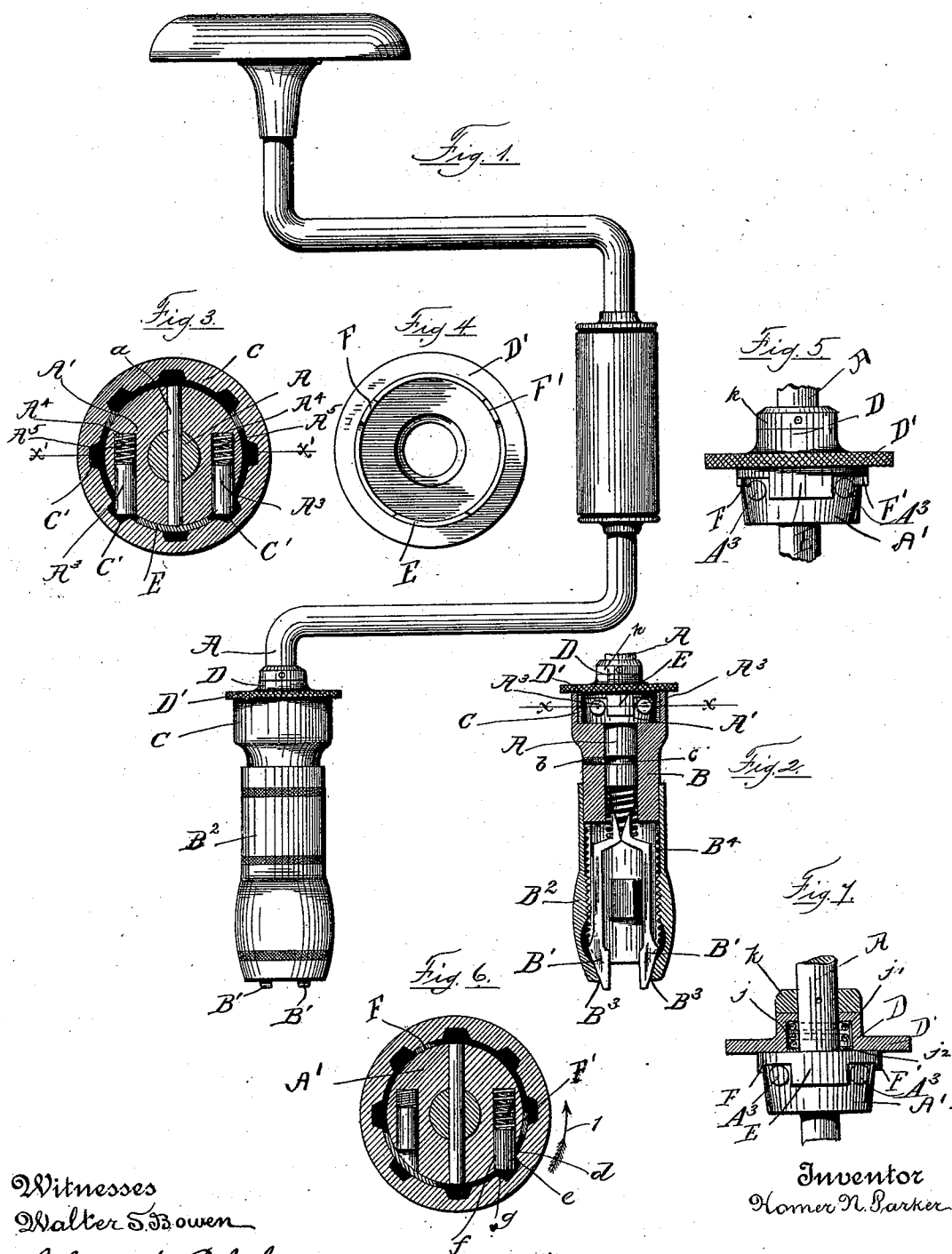
(No Model.)

H. N. PARKER.

PAWL AND RATCHET COUPLING FOR ROTATING TOOLS.

No. 510,046.

Patented Dec. 5, 1893.



UNITED STATES PATENT OFFICE.

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OF ONE-HALF TO ORLANDO MASON, OF SAME PLACE.

PAWL-AND-RATCHET COUPLING FOR ROTATING TOOLS.

SPECIFICATION forming part of Letters Patent No. 510,046, dated December 5, 1893.

Application filed January 9, 1891. Serial No. 377,286. (No model.)

To all whom it may concern:

Be it known that I, HOMER NEWTON PARKER, a citizen of the United States, and a resident of Winchendon, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Pawl-and-Ratchet Couplings for Rotating Tools, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, and in which—

Figure 1 represents a brace-bit embodying my invention. Fig. 2 is a central, longitudinal sectional view of the bit holding mechanism and disclosing my improved pawl and ratchet device. Fig. 3 is a transverse sectional view on line X, X, Fig. 2. Fig. 4 is an end view of the device by which the pawls are held from engaging with the bit holding mechanism. Fig. 5 is a side view of the same. Fig. 6 is a transverse sectional view on line X, X, Fig. 2, but showing one of the pawls as being held from acting upon the bit holding mechanism. Fig. 7 is a side view of the device by which the pawls are held from engaging with the bit holding mechanism, collars *k* and *D* being shown in sectional view on line X', X', Fig. 3.

Similar letters refer to similar parts in the different figures.

The object of my invention is to provide a coupling mechanism by which the reciprocating rotary motion of a tool handle will be converted into an intermittent motion in either direction of the tool and which will also permit the tool to be driven continuously in either direction by the rotation of the handle.

In the accompanying drawings I have shown my invention as applied to a bit-brace, but by a slight modification in the form and arrangement of some of the parts, it could obviously be equally well adapted to screwdrivers, ratchet wrenches and many other tools, which are used under conditions which prevent a continuous rotation of the handle.

A denotes a stem forming a portion of the handle to which the cylinder A' is attached by a pin *a*.

A⁴ are pockets in the cylinder A' to receive the pawls A³, and the small spiral springs A⁵.

Rotating around the stem A, but held from longitudinal movement upon the stem by a

screw *b* entering a groove *c*, is the tool holder B, carrying the jaws B', B', which are compressed upon the shank or tang of the tool by means of the sleeve B² acting upon the inclined surfaces B³ of the jaws as the sleeve is screwed upon the screw threaded section B⁴ of the tool holder B. The tool holder B is provided with a concentric flange C, which extends over the periphery of the cylinder A', and upon the inside of the flange C are the longitudinal grooves C', C' so arranged with equi-distant spaces that the ends of the pawls A³ will enter two of the grooves as shown on Fig. 3.

D is a collar journaled upon the stem A and having flanges E, F and F' extending over the periphery of the cylinder A', and between it and the flange C. The flange E is nearly as wide as the space between the pawls A³, A³, and the flanges F, F', are so arranged that as the collar D is rotated bringing either one or the other of the flanges F or F' against the pawls A³ the flange E will be carried over the other of the pawls A³ forcing it into its pocket and compressing its spiral spring, and as the collar is rotated in the opposite direction the other of the pawls will be forced within its pocket and held from engagement with the inner surface of the grooved flange C. In Fig. 6 of the drawings one of the pawls is shown as forced within its pocket by the flange E and the other pawl is represented in position to cause the rotation of the stem A and cylinder in the direction of the arrow 1 to be imparted to the flange C and tool holder, the side *d* of the pawl pressing against the side wall *e* of one of the grooves C' the pressure being received by the wall of the pawl pocket at *f*, but in case the stem A and connected cylinder A' is rotated in a direction opposite to that indicated by the arrow 1, the wall *g* of the groove C' will pass over and in contact with the outer end of the acting pawl, forcing it into its pocket, until the next succeeding groove C' is reached when the pawl will be thrown out by the action of its spiral spring to be again forced in as the rotation of the stem A and cylinder A' is continued.

The outer ends of the pawls A³ are cut square or at right angles with the axis of the pawls so the action of the flange E is not af-

fectured by the rotation of the pawls within their pockets, which would be the case were the ends of the pawls required to be beveled.

The strain upon the driving pawl in the rotation of the tool-holder as represented in Fig. 6 is in the nature of a compression of the pawl against the wall *f* of its pocket so that no breaking strain is received by the pawl in driving the tool-holder.

10 It will be obvious that two other and similar pawls could be held in the cylinder *A'* and upon the opposite side, and the flange *E* could be duplicated upon the opposite side if desired.

15 The collar *D* has a flange *D'*, with its edge projecting over the periphery of the flange *C*, with a milled edge in order to allow the collar with the flanges *E*, *F* and *F'*, to be readily rotated.

20 The strain incident to driving the tool-holder is imparted to the tool-holder in a line at right angles to the axis of the stem *A* and tool-holder *B*, by which I obviate a thrusting strain upon the tool-holder which would tend to crowd it off the stem *A* and cause an undue strain and consequent wear within the groove *c*.

The collar *D*, is provided with a recess *j*, Fig. 7, forming, when the collar is in position 30 an annular chamber, as shown in Fig. 7, within which I place the spiral spring *j'*. The spring *j'*, bears against an annular washer *j''*, Fig. 7, which rests upon the cylinder *A'*, and the opposite end of the spring *j'*, bears 35 against the end wall of the annular recess *j*, thereby forcing the collar *D*, against the collar *k*, which is attached to the stem *a*. I thus produce sufficient frictional resistance to the rotation of the collar *D*, to hold it in any desired position.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a cylinder having pawl pockets and arranged to be rotated by 45 the rotation of the handle, pawls held in said pockets, springs by which said pawls are pushed outwardly, a flange extending concentrically over said cylinder, and provided with internal grooves, arranged to be engaged by 50 said pawls, whereby the rotation of said cylinder is imparted to said flange, and a collar

journalled concentrically to said cylinder and provided with a flange extending over said cylinder, by which said pawls are alternately forced into their pockets, substantially as described. 55

2. The combination of a cylinder carrying actuating pawls, actuating pawls carried in the cylinder, a grooved flange extending over said cylinder and arranged concentrically 60 thereto, a collar capable of rotation and with its axis coincident with the axis of said cylinder and having a radial flange, by which said collar is rotated and a concentric flange attached to said radial flange and interposed 65 between said cylinder and said grooved flange, by which the actuating pawls are forced into said cylinder, substantially as described.

3. The combination with actuating pawls substantially as described and a grooved 70 flange actuated by said pawls, of the flange *E*, interposed between said pawls alternately and said grooved flange, and the stop flanges *F*, *F'*, said flange *E*, and said stop flanges *F*, *F'*, being attached to a rotating collar and a 75 rotating collar, substantially as described.

4. The combination with a rotating stem forming part of the handle, of a cylinder carried by said stem, actuating pawls held in said cylinder, a fixed collar attached to said 80 stem, a collar capable of rotating on said stem between said cylinder and said fixed collar and having flanges arranged to disengage said pawls and provided with a recess, and a spring held in said recess, with its tension applied 85 to produce a friction upon said rotating collar, substantially as described.

5. The combination of cylinder *A'*, carrying actuating pawls rotating collar *D*, provided with a flange *E*, by which said pawls are 90 disengaged and having an annular chamber, a spring *j'*, inclosed in said annular chamber and a fixed collar *k*, all arranged and operating, substantially as described.

Dated at Winchendon, in the county of 95 Worcester and State of Massachusetts, this 3d day of January, 1891.

HOMER NEWTON PARKER.

Witnesses:

GEO. M. WHITNEY,
ABBIE C. ROBBE.