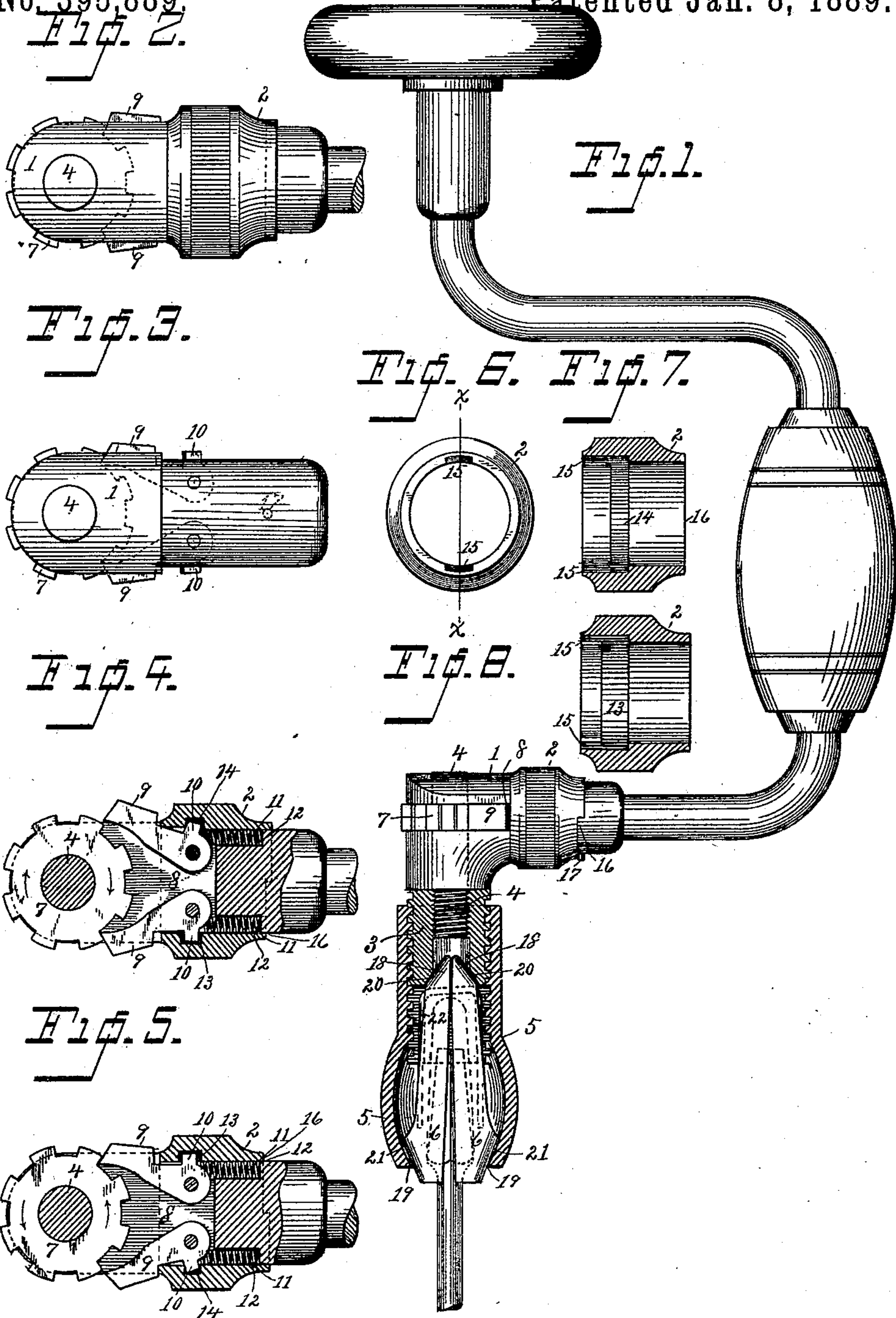


(No Model.)

J. S. FRAY.
RATCHET BRACE.

No. 395,889.

Patented Jan. 8, 1889.



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UNITED STATES PATENT OFFICE.

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RATCHET-BRACE.

SPECIFICATION forming part of Letters Patent No. 395,889, dated January 8, 1889.

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To all whom it may concern:

Be it known that I, JOHN S. FRAY, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Ratchet-Braces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of this class of braces, and has for its object to simplify the construction and to greatly improve the mode of operation in use.

With these ends in view I have devised certain novel improvements in the construction and arrangement of the ratchet mechanism, which I will now describe.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation of a ratchet-brace, the sleeve and head being in section; Fig. 2, a plan view of the stock with the shifting-sleeve in position; Fig. 3, a plan view of the stock with the shifting-sleeve removed; Fig. 4, a horizontal section of the stock, showing the operation of the ratchet and dogs, the left dog being engaged and the right disengaged; Fig. 5, a similar section, showing the dogs shifted so that the operation is reversed; Fig. 6, a plan view of the shifting-sleeve detached; and Figs. 7 and 8 are sections of the shifting-sleeve on the line $x x$ in Fig. 7, looking in opposite directions and showing the wide and narrow grooves on opposite sides.

Similar numbers denote the same parts in all the figures.

1 denotes the stock; 2, the shifting-sleeve; 3, the head; 4, the shank, made integral with or rigidly secured to the head and extending up through the stock; 5, the locking-sleeve, and 6 the jaws. The ratchet 7 is rigidly secured to the shank and lies in a recess, 8, in the stock.

9 denotes the dogs, which are pivoted in recess 8, and are provided with lugs 10, adapted to engage grooves in the shifting-sleeve, as will be more fully explained. The edges of the ratchet-teeth are preferably inclined inward instead of outward, and the ends of the dogs

are beveled, so as to engage the edges of the teeth with a positive firm hold, as shown at the left in Fig. 4 and at the right in Fig. 5.

11 denotes springs lying in recesses 12 in the stock, the forward ends of which bear against the dogs and act to throw them to the engaged position. The shifting-sleeve is provided on its opposite inner sides with a wide groove, 13, and a narrow groove, 14, said grooves when the parts are assembled being engaged by lugs 10 upon the dogs. The operative faces of lugs 10 are rounded, as shown in Fig. 3, so that they will pass readily into grooves 13 and 14 in use.

It will be noticed in Figs. 7 and 8 that the bottoms of grooves 13 and 14 are in line with each other, the difference in width being all at the outer edge. 15 denotes longitudinal grooves on the opposite inner sides of the shifting-sleeve, which receive lugs 10 in assembling the parts.

The operation of this portion of my invention is as follows: Groove 13 is sufficiently wide, so that when either of the lugs 10 is in engagement therewith the position of that dog will not be shifted. As soon, however, as the shifting-sleeve is rotated sufficiently to cause either of the lugs to pass into groove 14, the action of the outer wall of this groove is to swing that dog outward, as shown at the left in Fig. 5 and at the right in Fig. 4. In practice I preferably cut out a portion of the rear edge of the sleeve, as at 16, and provide a pin or stud, 17, firmly driven into the stock and projecting into the cut-out portion, as clearly shown in Fig. 1. When the shifting-sleeve is thrown to either extreme of its movement, the lug in engagement with the narrow groove is forced backward, which lifts that dog out of engagement with the ratchet, as at the right in Fig. 4 or the left in Fig. 5.

It will be seen from Figs. 7 and 8 that the longitudinal grooves 15 extend to the bottom of grooves 13 and 14, so that the actual length of both the wide and narrow grooves is considerably less than half the inner circumference of the shifting-sleeve. In Figs. 1, 2, and 3 the parts are all shown at an intermediate position—that is, a position in which neither of the lugs upon the dogs is in engagement with the narrow groove. This leaves both

dogs free to be moved forward by the springs and to engage the edges of ratchet-teeth, as clearly indicated in Figs. 2 and 3. The brace now acts as an ordinary brace and the bit is carried forward by rotation in one direction and turned backward by rotation in the opposite direction. Suppose now that it is desired to use the brace as a right-hand ratchet-brace. The shifting-sleeve is given a half-turn toward the right, as in Fig. 4, or until its movement in that direction is stopped by pin 17. This movement causes the lug upon the right dog to be engaged by the narrow groove and thrown outward to the position shown in Fig. 4. This insures that when the stock is turned toward the right the ratchet, &c., will be turned toward the right also through the engagement of the left dog with the ratchet, and that when the stock is turned toward the left the left dog will slip over the face of the ratchet-teeth, the right dog being retained out of operative position by the engagement of its lug with the narrow groove. Suppose now that the reverse of this movement should be required, the sleeve is turned to the extreme of its movement in the opposite direction, which places the right dog in engagement with the ratchet and the left dog out of engagement with it, as shown in Fig. 5, the operation being the same as before.

It will of course be understood that the details of construction may be varied within reasonable limits without departing from the spirit of my invention.

I claim—

1. In a brace, the combination, with the ratchet, of pivoted dogs adapted to engage opposite sides thereof and having lugs 10,

and a sleeve having grooves 13, 14, and 15, adapted to be engaged by said lugs, whereby either dog may be lifted out of engagement with the ratchet, as and for the purpose set forth.

2. The ratchet, and the dogs having lugs 10, in combination with a sleeve having longitudinal grooves 15, and wide and narrow circumferential grooves on opposite sides thereof, whereby when either lug is caused to engage the narrow groove that dog is lifted out of engagement with the ratchet, but when neither lug is in engagement with the narrow groove both dogs are free to engage the ratchet.

3. The combination, with the ratchet, and dogs pivoted in the horizontal plane thereof, and having lugs 10, of springs 11, whereby the dogs are thrown into engagement with the ratchet, and the sleeve having wide and narrow circumferential grooves adapted to be engaged by said lugs, whereby either dog may be lifted out of engagement with the ratchet.

4. The stock having a pin, 17, the ratchet, and the dogs having lugs 10, in combination with the sleeve having cut-out portion 16, the ends of which are engaged by said pin to limit the oscillation of the sleeve, and wide and narrow grooves which are engaged by said lugs.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN S. FRAY.

Witnesses:

A. M. WOOSTER,
A. B. FAIRCHILD.