

(No Model.)

P. A. WHITNEY.

RATCHET DRILL.

No. 297,210.

Patented Apr. 22, 1884.

Fig. 1.

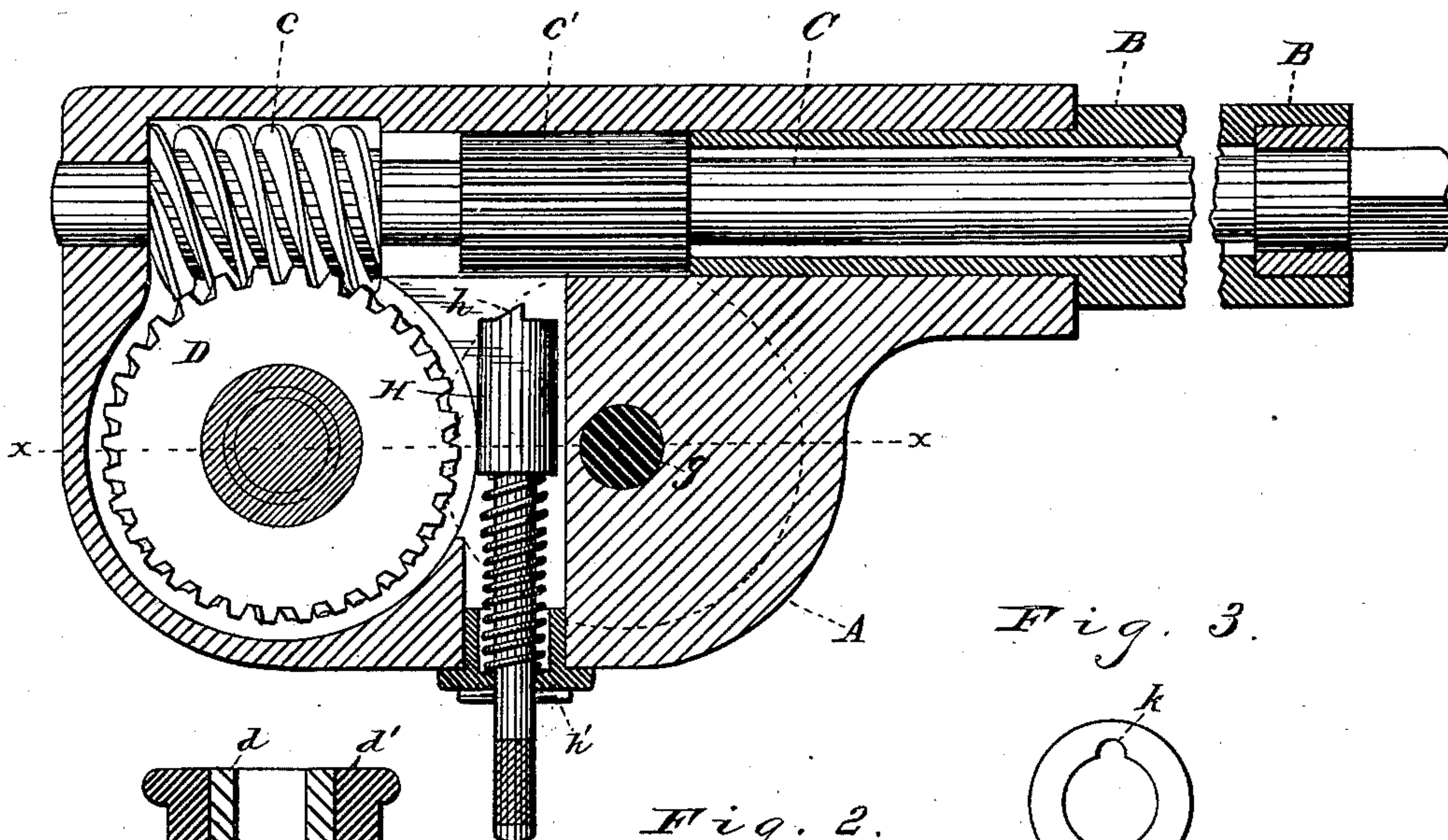


Fig. 3.

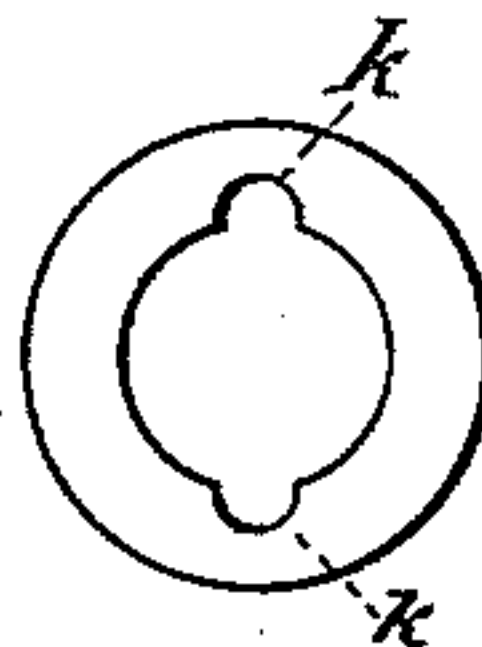


Fig. 2.

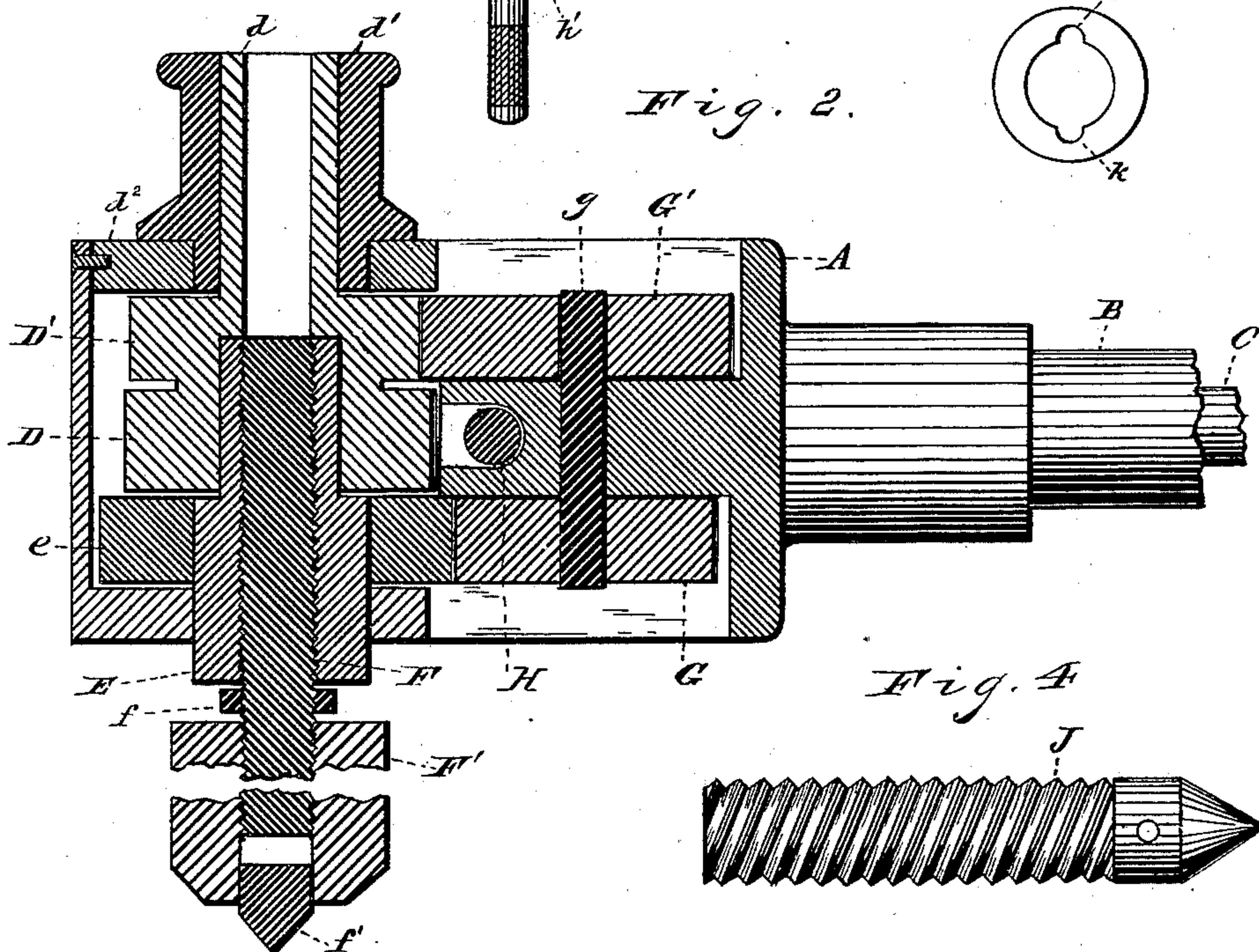
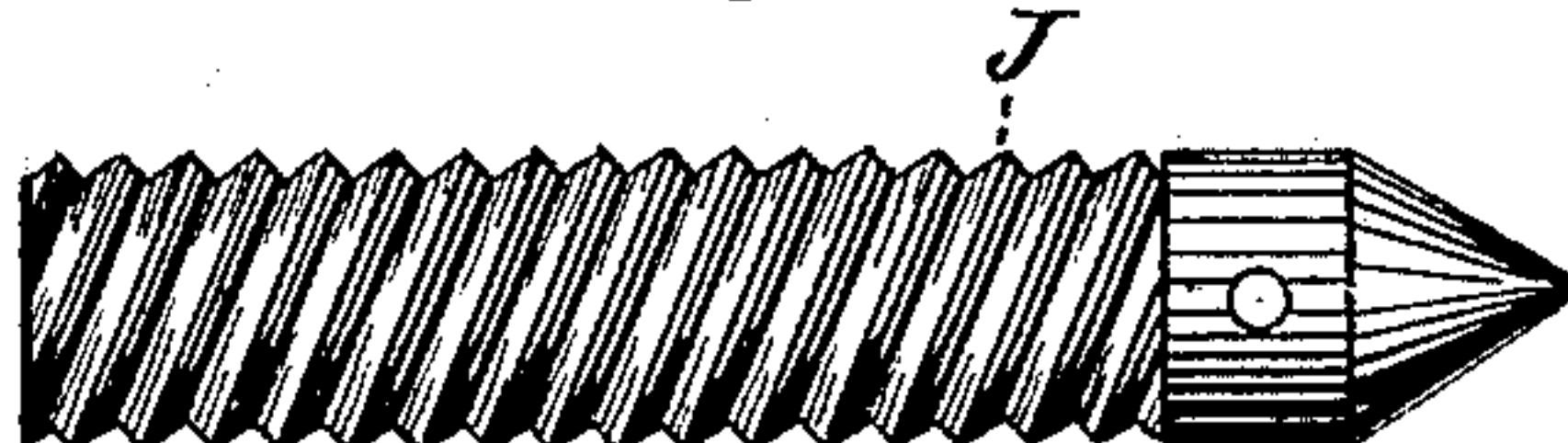


Fig. 4.



WITNESSES

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RATCHET-DRILL.

SPECIFICATION forming part of Letters Patent No. 297,210, dated April 22, 1884.

Application filed June 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, PARDON A. WHITNEY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ratchet-Drills; 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 pertains to make and use the same.

My invention relates to improvements in ratchet-drills; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a horizontal sectional view of my improved ratchet-drill. Fig. 2 is a vertical section on the line of xx , Fig. 2. Figs. 3 and 4 are detail drawings of parts of the device.

A represents the casing; B, the handle, preferably screwed into the casing, and of any desired length.

C is a shaft extending through the handle and squared at the outer end to receive a handled crank. The other end is journaled in the casing, and has next to the bearing the worm c , and farther along the shaft the ratchet-wheel c' . The two sides of the teeth on this ratchet-wheel are alike, and adapted to engage a pawl or detent from either direction. The end of the ratchet c' butting against the inner end of the handle, and the end of the worm butting against the casing, prevent all end-play of the shaft C. The worm c has a coarse, and, preferably, a quadruple, thread, in order that the pitch of the thread may be so quick that the worm may be easily revolved by turning the engaging worm-gear D. This worm-gear D is preferably integral with the spur-gear D' and the drill-socket d . A thimble, d' , is added to the socket to give additional strength and a better finish to this part of the device.

The thimble preferably extends through the head d^2 to receive the wear at this point, as both the thimble and the head d^2 are easily renewed. The inner end of this part, consisting of the said gears and socket, has a bore that embraces the journal end of the part E, that in turn has a central bore that is threaded and engages the screw F. This screw has a head, f , by which it may be turned, and ex-

tends also nearly through the cap F'. This cap and screw, broken in the drawings, are usually six or seven inches long, according to the size of the tool; and the cap at the outer end is provided with the point f' . The part E has rigidly attached the spur-gear e , engaging the gear G, attached to the shaft g , that is driven by the gear G', that in turn is actuated by the engaging-gear D'.

H is a spring-detent with a single tooth, h , at the inner end, that is sloping on one side and adapted to engage the ratchet-wheel in one direction, and to slide over the ratchet without engagement in the opposite direction. Toward the outer end of the part H is a small cross-pin, h' , that may rest on the casing and hold the detent in the position shown. If, however, the detent is turned at a right angle to the position shown, the pin h' can drop into the grooves k , (shown in Fig. 3,) and this will allow the detent to engage the said ratchet c' in one direction; and it will be seen that if the detent is drawn back and turned half around the pin h' will still drop into the said grooves k and the detent will engage the ratchet in the opposite direction.

The operation of my device is as follows: A drill held by the socket d is set in position for drilling, the point f' is secured, and the handle operated, all in the manner of common ratchet-drills. When the handle is thrust back, the worm-gear D, by means of the engagement of the drill with the work, does not turn, but in place thereof the worm c , by means of its quick thread, revolves and the spring-detent slides over the ratchet c' without engagement. When, however, the handle is drawn forward, the detent engages the ratchet c' and holds it, together with the attached shaft C and worm c , from turning. As the said worm cannot turn backward, but is held firm, of course the worm-gear D is turned forward with the motion of the handle B. If, however, as is frequently the case, there is not room to operate the handle, as aforesaid, the detent may be drawn back and secured in the position shown in Fig. 1, after which a crank may be applied to the end of the shaft C, and by revolving the shaft a continuous motion may be given to the gear D and the drill.

The gears G and G' may be one or both of

them removed and the drill fed in the usual manner by unscrewing the socket F, which of course presses the point *f* against its support and holds the drill to its work. When the cap F' approaches as near the end of the screw as is practicable, the drill may still be fed some distance farther by unscrewing the screw in the part E. If the cap F' was kept from revolving, and the part E was made fast to the drill-socket, the screw F would be turned out one thread by every revolution of the drill. This, unless the threads on F were too fine for durability, would feed the drill too fast. Now, if the part E is allowed to revolve in its seat on the socket *d*, as was intended, and the gears G and G' are placed in position, as shown in Fig. 2, it will be seen that as the gear D' is less in diameter than the gear G', and the gear G is smaller than the gear *e*, the part E will revolve more slowly than the drill, and the screw F will have only been turned out a part of a thread during one revolution of the drill. A thread may therefore be used at F of sufficient pitch to make it durable, and the required feed had by means of the relative sizes of the gears employed.

When necessary, the screw F may be removed and the screw J inserted in its place in the part E. This may be used in places where there is not room for the longer parts F and F'.

What I claim is—

1. In a ratchet-drill, the combination, with a suitable casing and handle, of a drill-socket, a worm-wheel rigidly secured thereto, a revolving shaft, and a worm secured to the shaft, substantially as set forth.

2. The combination, with a suitable casing

and handle, of a shaft passing longitudinally through the handle, and provided with a worm, a worm-wheel journaled within the casing and meshing with the worm, a drill-socket rigidly secured to the worm-wheel, the part E, screw F, and mechanism for transmitting the motion of the worm-wheel to the part E, substantially as set forth.

3. In a ratchet-drill, the combination, with a casing and handle, and a shaft journaled within the casing and provided with a worm, of a gear meshing with the worm, a drill chuck or socket rigidly secured to the worm-gear, and a pawl and ratchet for holding the shaft against movement in one direction, substantially as set forth.

4. In a ratchet-drill, the combination, with the casing, handle, shaft, the latter being provided with a worm and ratchet-wheel, a worm-gear, and drill chuck or socket, of a spring-actuated detent adapted to be turned so as to engage the ratchet-wheel on either side of the shaft, substantially as set forth.

5. The combination, with the handle and casing, of the shaft provided with a worm, a worm-wheel meshing with the worm, a drill-socket rigidly secured to the worm-wheel, the pinion D', the part E, the pinions G and G', and the screw F, all of the above parts combined and adapted to operate as described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 15th day of June, 1883.

PARDON A. WHITNEY.

Witnesses:

ALBERT E. LYNCH,
CHAS. H. DORER.