

(No Model.)

C. E. TUNELIUS.

RATCHET DRILL.

No. 307,507.

Patented Nov. 4, 1884.

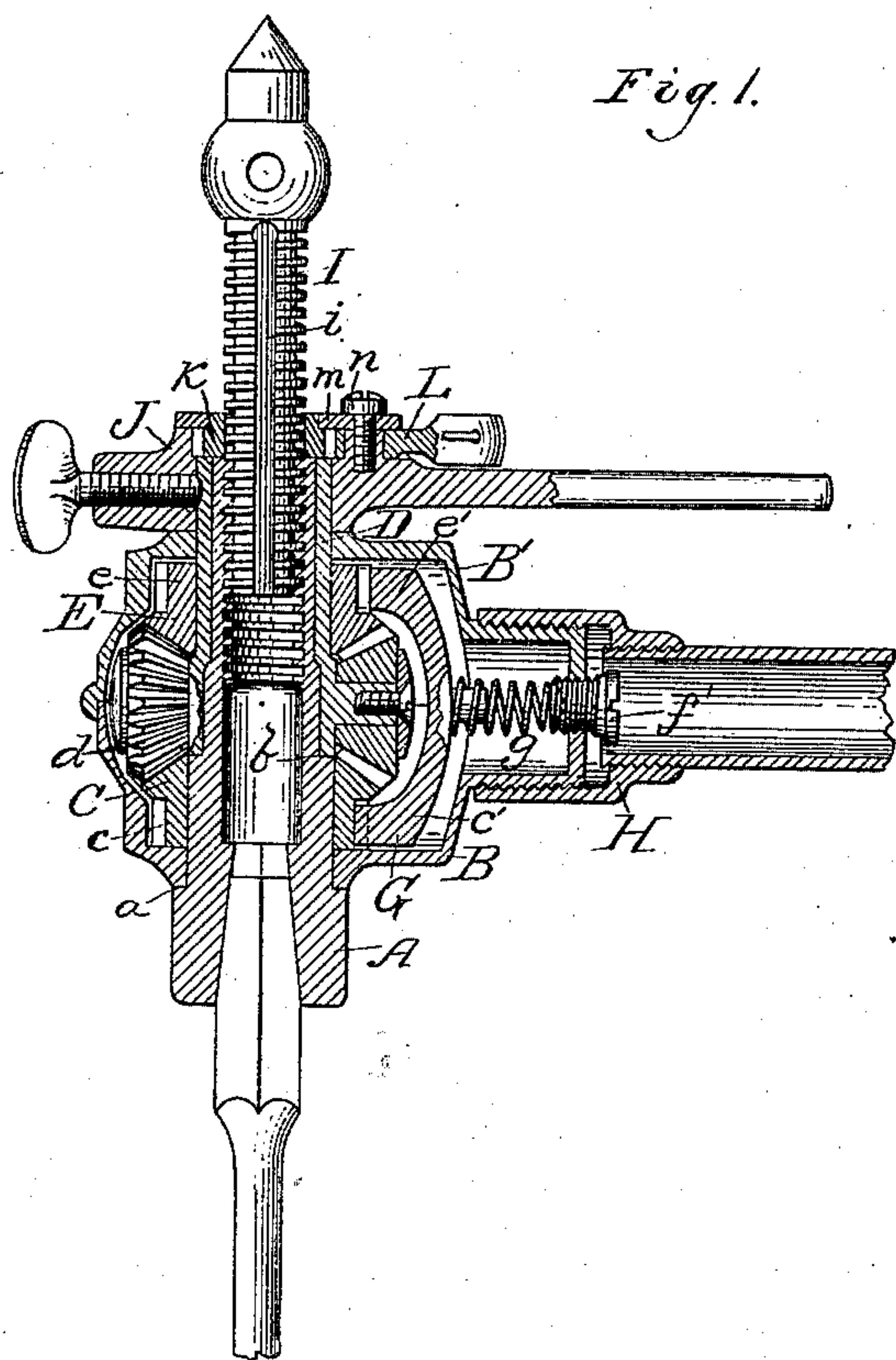


Fig. 1.

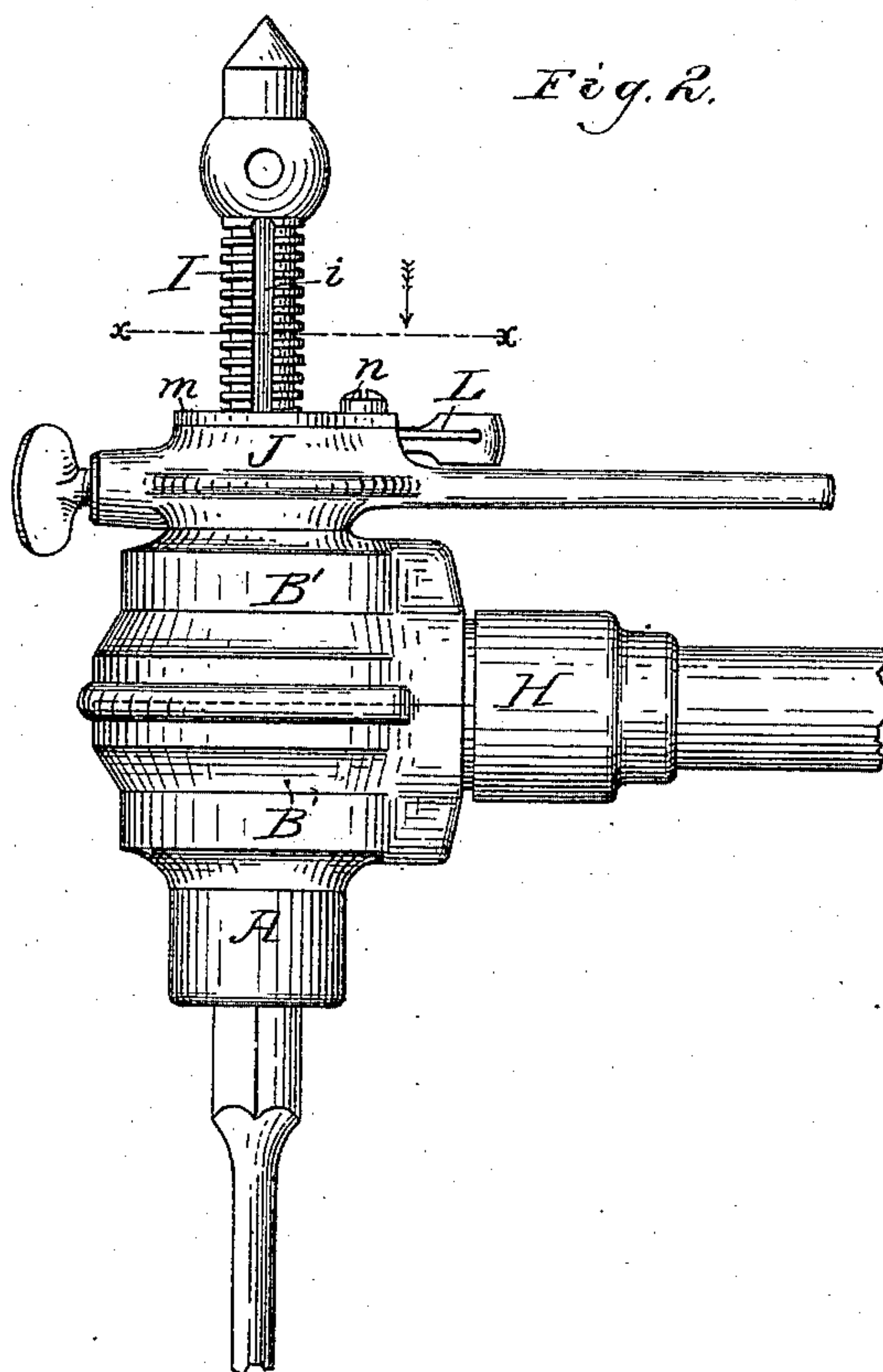


Fig. 2.

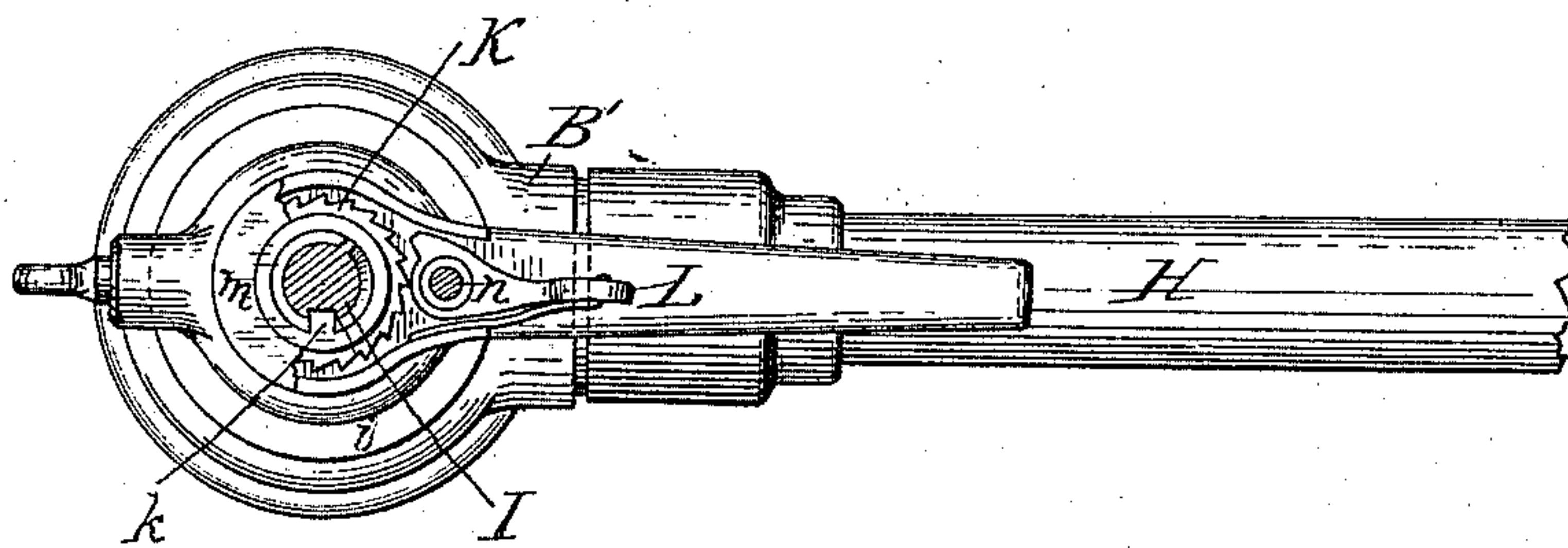


Fig. 3.

Witnesses

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RATCHET-DRILL.

SPECIFICATION forming part of Letters Patent No. 307,507, dated November 4, 1884.

Application filed January 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. TUNELIUS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ratchet-Drills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to produce a ratchet-drill which has either a continuous or an intermittent forward movement, as desired, and which also possesses means for feeding the drill without resorting to the devices used in the ordinary ratchet-drill for that purpose.

In the drawings, Figure 1 is a vertical longitudinal central section. Fig. 2 is a side elevation; and Fig. 3 is a plan view.

Reference being had to the drawings, A represents the bit-stock provided with a shoulder, *a*, upon which the lower section, B, of the case surrounding and inclosing the operative device of my ratchet-drill rests. The bit-stock A extends upward through the case B B', and is stepped at *a* and at *b*.

Made fast to that portion of the bit-stock above shoulder *a* is a beveled gear, C, having the ratchet *c* made integral therewith, and resting on the shoulder of and surrounding the stepped portion *b* is the sleeve D, which corresponds in length to the distance from said shoulder to the top of the bit-stock. Near the lower end of this sleeve are two studs, made integral therewith and projecting at right angles therefrom diametrically opposite each other. On these studs are loosely placed the idle beveled pinions *d d*, which mesh with the beveled gear C and with the beveled gear E above, which is loosely journaled on the sleeve D, and has a ratchet, *e*, preferably integral therewith, extending from its crown.

Engaging the ratchets *c* and *e*, the teeth of which, it will be understood, face in opposite directions, is a spring-actuated double pawl, G, having a shank which enters a coil expansion-spring, *g*, the other end of which latter enters a concavity in the contiguous end of a set-screw, *f'*. The pawl G is provided with

the arms *c'* and *e'*, which are provided with teeth or serrations adapted to engage those of the ratchets *c* and *e* respectively.

Surrounding and inclosing the devices which I have heretofore described, with the exception of portions of the bit-stock A and sleeve D, is a case composed of a lower part, B, resting on the shoulder *a*, as hereinbefore explained, and the upper part, B', the edges of which rest upon and overlap the contiguous edges of the lower part, B. The two parts B and B' of the case extend back in such a manner as to form a cylindrical pocket for the reception of the spring *g*, and are screw-threaded on their outer surfaces, so that by screwing the handle H over them the two parts of the case are securely held together.

In operating my invention, as the handle is oscillated from right to left the teeth *c'* of the lower arm of the double pawl will engage the ratchet *c* and urge the same and the bit-stock to which it is securely fastened forward. It will be noticed that the motion imparted to the ratchet *c* and pinion C (which, as heretofore explained, are made in one piece) will operate pinions *d*, and through them pinion E; but the pinion E, being loose on the sleeve D, will not in any way affect the forward motion of the bit-stock, and will, moreover, slip the teeth of the pawl *e'*. Now as the handle is oscillated from left to right the teeth *c'* of the pawl will slip over the teeth of the ratchet *c*, and the teeth *e'* will engage the ratchet *e* and urge it and the pinion E in a direction corresponding to the oscillation of the handle. This pinion E imparts motion to the idle-pinions and through them (providing the sleeve on the studs of which they are journaled is held stationary) will drive the pinion C and bit-stock to which it is fast forward. Thus a continuous forward movement of the bit-stock is obtained. If an intermittent forward motion is desired, all that is necessary is to permit the sleeve to move loose *ad libitum*.

In order to control the action of the sleeve D, I extend the same a suitable distance up beyond the confines of the case, and surround the same by a boss, J, from one side of which extends a handle, and which is tapped to receive a thumb-screw, preferably diametrically opposite the handle J, which bites the sleeve

and thus places it within the control of the operator.

In ratchet-drills of this character it is desirable to obtain as near as possible an automatic feed—that is, without resorting to independent devices. In order to accomplish this, I tap the bit-stock longitudinally from the top, (which is about on the same plane as the top of the sleeve D,) so as to receive the screw I, which latter is provided with a longitudinal groove, *i*. Resting on a suitable shoulder in the bore of the boss J, above the tops of the bit-stock and sleeve D, made by increasing the diameter of said bore, is the ratchet K, encircling said screw and having a tenon, *k*, entering the groove *i* thereof. This ratchet is engaged at the will of the operator by the spring-actuated pawl L. This pawl is placed in a suitable recess in the upper portion of the boss J, which extends up a suitable distance to receive the same, and the whole is covered by a suitable plate, *m*, held down by a screw, *n*, which also serves as the pivot of the pawl L.

When it is desired to feed the drill, the thumb of the operator's hand which grasps and holds the handle H is pressed against that arm of the pawl L extending out a short distance over the said handle and engages the ratchet K, which by means of the tenon *k* holds the screw, while the bit-stock is oscillated from right to left, thus urging said screw upward.

I am aware of the existence of Letters Patent numbered 292,345, granted January 22, 1884, to Wm. Moritz; but in that patent casing I, plates *g g'*, and the means for securing them together, are different from the two sections of the case shown in my ratchet, which are secured together by the handle. Moritz's feeding devices are also different. Cap F and bearing-plug K are dispensed with by me, and, instead of having ring *m* and screw *y* for regulating the feed and preventing sleeve D

from turning independently, I have a boss with a dog in it, as shown, and a pawl in the upper surface of said boss, which engages a ratchet, (the equivalent of Moritz's ring *m*.)

The superiority of my feeding devices is that the feed is more positive, for the reason that in Moritz's the serrated plug K and cap F may so wear the surface against which it presses as to slip and be inoperative.

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

1. The combination, with the bit-stock, pinion C, and ratchet idle-pinions *d d*, loose sleeve D, on studs projecting from the lower end of which said pinions are journaled, pinion E, and ratchet *e*, and the double spring-actuated pawl G, of the boss J, surrounding the upper end of said sleeve, and having a set-screw to bite and hold said sleeve stationary.

2. The combination of the handle with the cylindrical case, the latter composed of two parts having together a cylindrical extension preferably screw-threaded on its circumference, the handle fitting over said extension and keeping the parts of the case securely together, as set forth.

3. The combination, in a ratchet-drill, of the bit-stock, the double-acting pawl-pinions C and E, ratchets made integrant therewith, and idle-wheels *d d*, as described, with the screw I, having a longitudinal slot, *i*, ratchet K, loose on said screw and having a tenon, *k*, which enters said slot *i*, and means for holding said ratchet stationary when desired to regulate the feed of said drill.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

CHARLES E. TUNELIUS.

Witnesses:

JAMES H. COYNE,
FRANK D. THOMASON.