T. J. SLOAN.

Ratchet-Drills.

No. 142,356. Patented September 2, 1873.

Fig: 1

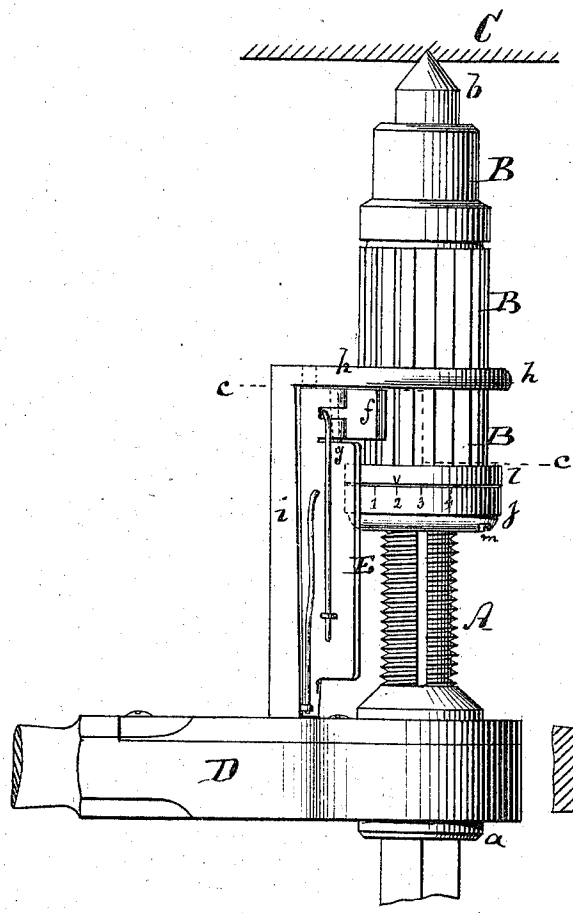


Fig: 3

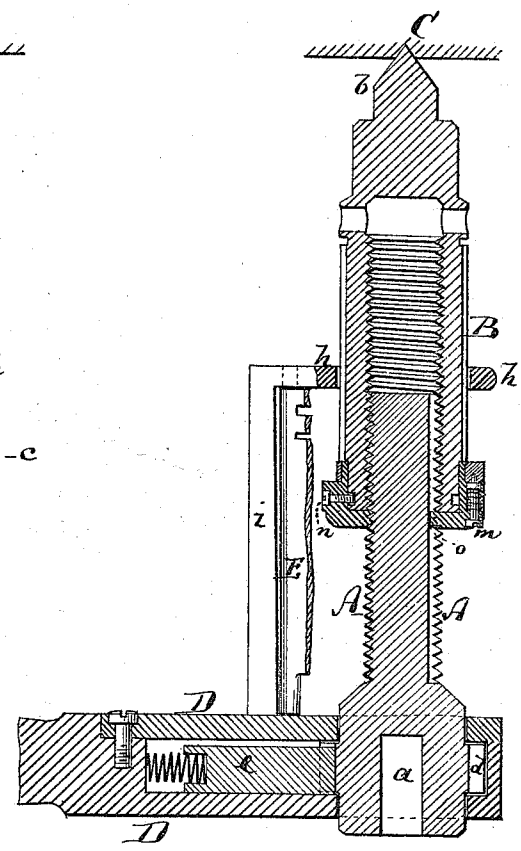
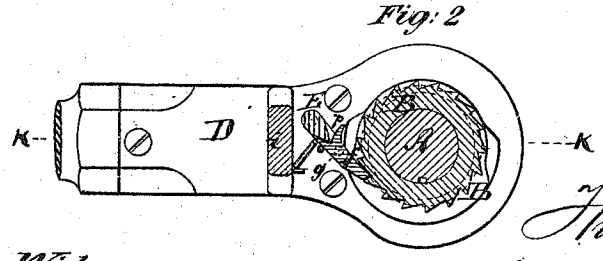


Fig: 2



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UNITED STATES PATENT OFFICE.

THOMAS J. SLOAN, OF TUCKAHOE, NEW YORK.

IMPROVEMENT IN RATCHET-DRILLS.

Specification forming part of Letters Patent No. **142,356**, dated September 2, 1873; application filed January 15, 1873.

To all whom it may concern:

Be it known that I, THOMAS J. SLOAN, of Tuckahoe, in the county of Westchester and State of New York, have invented an Improved Hand Drilling-Machine, of which the following is a specification:

This invention relates to certain improvements on the hand drilling-machine for which Letters Patent of the United States were granted to me on the 25th day of June, 1872, numbered 128,430. The present invention consists more particularly in so connecting the screw in which the socket for receiving the shank of the drill is formed with the surrounding sleeve or nut that the screw will constitute the stationary point or support on which the drill is fed—that is to say, instead of turning the screw for the purpose of feeding the drill gradually toward and through its work, its nut is turned to effect the same end, the screw meanwhile remaining unmoved to support the feeding-nut. An ordinary ratchet-handle is applied to the screw for turning it and the drill, and during the back stroke of this handle the feeding is effected, as stated. The invention also consists in connecting, with the handle of the drilling apparatus, a jointed pawl, which engages in ratchet-teeth of the aforementioned surrounding nut in such manner that it will roll out of said teeth whenever the feed-motion is to terminate, and not offer any resistance while being raised out. The invention also consists in such a novel general arrangement of parts that the handle of an ordinary ratchet-drill, when provided with the aforementioned jointed pawl, will cause, by the action of said pawl, the drill to be fed during the back motion of the handle as far, at least, as the feed-controlling devices, which are applied to the end of the nut, will permit it. By arranging the screw stationary, as stated, and feeding by means of the nut, the screw becomes also an index to show the degree of feed and the amount to which the drill has been fed down, and how far it can still be fed.

In the accompanying drawing, Figure 1 represents a side elevation of my improved drilling apparatus. Fig. 2 is a horizontal section of the same on the line C C, Fig. 1; and Fig. 3 is a vertical section of the same on the line K K, Fig. 2.

Similar letters of reference indicate corresponding parts.

The letter A in the drawing represents a screw of suitable extent, provided at one end with a socket, *a*, to receive the prismatic or pyramidal end of the drill-shank. B is a nut fitting the screw, and of such length that about the entire threaded portion of the screw can enter it. A pointed teat, *b*, is formed at the upper or outer end of the nut B for the purpose of bearing against the stationary surface C that serves as a bearing or purchase for the drill-stock. A ratchet-wheel, *d*, embraces and connects with the lower portion of the screw A, containing the socket *a*, and is concealed within the handle D, through which the cylindrical and enlarged lower portion of said screw is loosely fitted, as shown in Fig. 3. This handle D contains a spring-pawl, *e*, which bears against the ratchet-wheel *d*, so that by turning the handle in one direction the screw will be turned by and with it, while, if the handle is turned in the other direction, the pawl *e* will slip on the ratchet *d*, and will leave the screw A unmoved. The periphery of the nut B is for nearly its entire length provided with ratchet-teeth, as is clearly shown in Fig. 2, a pawl, *f*, engaging into said teeth, which are set in a direction opposite to that of the teeth of the ratchet-wheel *d*. The pawl *f* is pivoted at *g*, Fig. 3, to a plate, E, and in a horizontal plate, *h*, that loosely embraces the nut B. This plate *h* is, by its standard *i*, rigidly connected with the handle. By means of a spring or springs the pawl *f* is held in contact with the toothed periphery of the nut B.

The operation of this drill is as follows: When the handle D is turned to carry the screw A around with it, the pawl *f* will slip on, or, by means hereinafter described, be held clear of, the nut B, and will therefore have no effect upon it. Whenever the handle is turned in the opposite direction the screw A will not be turned; but the pawl *f* will or may cause the nut to be turned with the handle, and by

such turning of the nut will cause the drill to be fed toward its work. The degree of feed at every stroke of the handle D is regulated by an enlarged sleeve or flange, *j*, which is fastened to the cylindrical lower part of the nut by screws *n*, which enter a groove cut around said nut to allow the flange to turn on the nut, but not move lengthwise on it. A feather, *o*, on the flange enters a longitudinal groove of the screw, or vice versa, for the purpose of causing the sleeve to turn with the screw and move lengthwise on it. A ring, *l*, is swiveled around the contracted upper portion of said flange or sleeve, or directly above said flange around the nut. Portions of the circumference of the flange *j* and ring *l*, that are otherwise of equal diameter, are cut away, and by turning the ring *l* the entire length of recess thus formed by the two cut-away portions of *j* and *l* may be increased or diminished at will, and the ring *l* locked in any desired portion by a spring-pin, *m*, entering from and through the sleeve one of a series of sockets in the lower surface of the ring, or by a screw or other fastening. The plate E is by its spring pressed against the circumference of the sleeve and ring, and when it enters the recess formed by their cut-away portions it will carry its pawl *f* against the toothed portion of the nut; but when it is raised out of such recess it will carry said pawl out of contact with the toothed portion of the nut. Therefore, the degree of feed is regulated by the length of recess of the gage-sleeve *j* and ring *l*. When the plate E is being raised out of said recess the pawl *f* would, were it not pivoted to the said pivoted plate, cause considerable friction by its motion along the surface of the tooth with which it may be in contact; but by being pivoted, as before mentioned, this friction is avoided, as the pawl *f* is enabled to roll on its pivot *g* independent of the motion of the plate E, and to clear the teeth of the nut B without difficulty. A spur, *p*, is formed on the back of the pawl for the purpose of preventing it from swinging too far while rolling out of the toothed portion of the nut. During the forward stroke of the handle, which causes the screw to turn, the feed-rings *j l* turn with it, while the nut B remains immovable, and during the back stroke these rings move lengthwise with the nut, while the same is being fed by the pawl *g*, but do not turn.

I claim—

1. The jointed pawl *f* E, applied to the handle of a ratchet-drill for turning the nut B and feeding the drill during the motion of the handle, as specified.

2. The swiveled sleeve *j* and ring *l*, applied to the feed-nut B of a drilling apparatus, substantially as set forth.

3. The pawl *f*, pivoted to the swinging plate E, and provided with the spur *p*, substantially as and for the purpose specified.

THOS. J. SLOAN.

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