J. Gray,

Ratchet Drill.

No. 70,199. Patented Oct. 29, 1867.

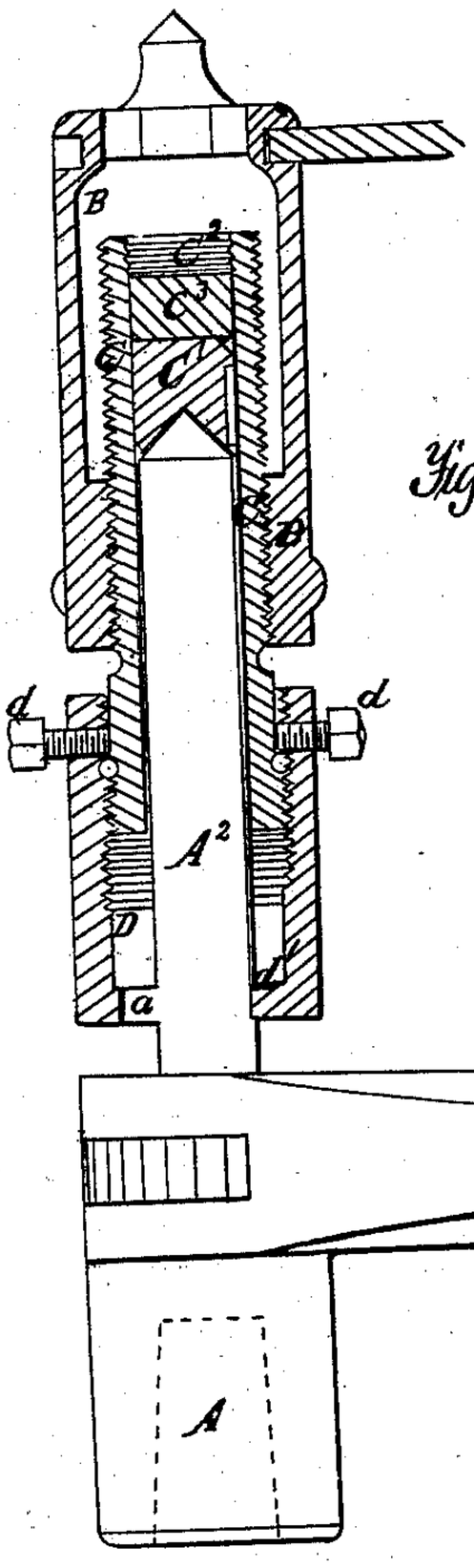


Fig. 1.

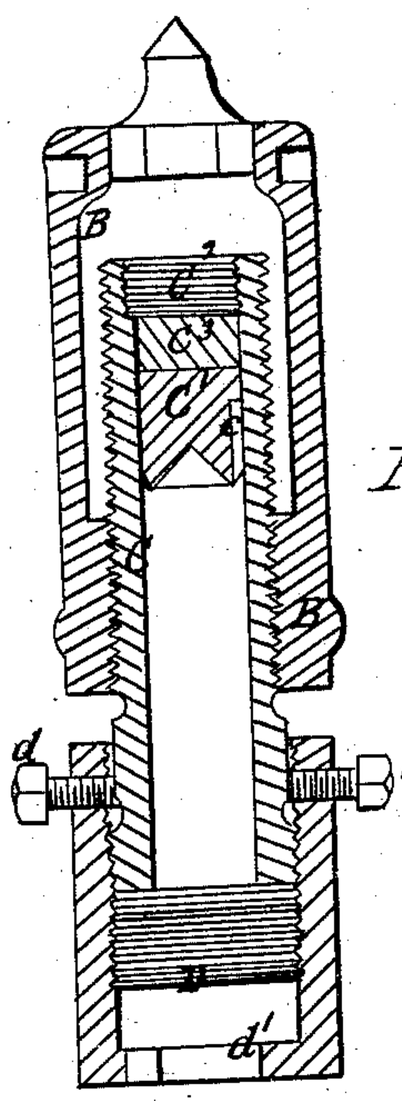


Fig. 2.

Fig. 3.

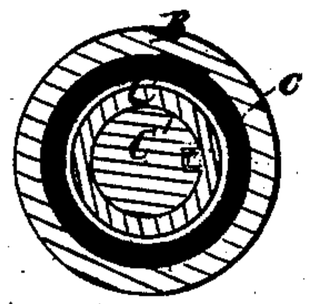
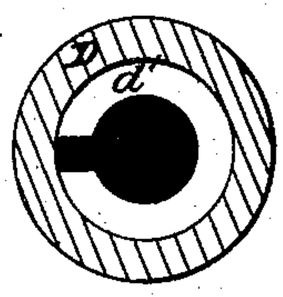


Fig. 4.



Witnesses.

Thomas J. Burridge

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JOHN GRAY, OF LITCHFIELD, ILLINOIS.

Letters Patent No. 70,199, *dated October* 29, 1867.

IMPROVEMENT IN RATCHET-DRILLS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN GRAY, of Litchfield, in the county of Montgomery, and State of Illinois, have invented a new and useful Improvement in Drill-Stocks; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to a drill-stock, so constructed as to be self-acting in its feed-motion, and the feed-motion is so applied that there will be a constant pressure brought to bear upon the drilling instrument, whether the resistance to be overcome be much or little.

To enable those skilled in the art to make and use my improved drill-stock, I will proceed to describe its construction and operation.

Figure 1 of the drawings is a sectional elevation of the improved drill-stock.

Figure 2 is a similar view of the feeding-screw.

Figure 3 is a horizontal section of the top end of the feeding-screw; and

Figure 4 is a horizontal section of the bottom end of the same.

It is to be distinctly understood that the devices for producing a constantly regular and self-acting feed-motion in the stock are the chief features of this invention, and that these improvements are readily adaptable to a ratchet-drill, drill-press, or any other form of drilling machine, or to any drilling machine now in use, but the following description will be particularly in reference to a ratchet-drill. The other applications can easily be made by any good mechanic.

A is the drill-socket, and A^1 the lever by which it is turned. The ratchet attachment of these parts is very similar to those now in use, and need not, therefore, be minutely described. The fulcrum-rest B is also of the common form. The feeding-screw C is hollow for the reception of the spindle A^2, which is a fixed portion of and co-axial with the drill-socket A. The top end of the spindle is conical in form, and fitted to a step in the sliding head C^1 within the feeding-screw C. An elastic cushion or spring of India rubber or its equivalent, is interposed between the sliding head C^1 and the fixed head C^2 of the screw. A dowel, *c*, projecting inwardly from the cylindrical feed-screw, is received in a groove in the side of the sliding head C^1, and prevents the latter from turning on its axis on the bearing of the spindle-head. The lower end of the screw C is screwed into the cylindrical head D, and is fixed in position by means of the set-screws *d d*. These set-screws bear upon longitudinal notches *e e*, shown in section in figs. 1 and 2, and at different points in these notches, according as the resistance of the spring C^3 to the drill is intended to be greater or less. If a weak drill is used, the resistance of the spring should be small in order not to break the drill, and, therefore, the sleeve D should be set so as to bring its lower end below that of the dowel *a*, in order that only a slight force may be required to push the dowel within the sleeve. On the other hand, if a powerful drill is used, the resistance of the spring may be greater without damage, and the sleeve D be set so as to bring its lower end above that of the dowel *d*. An inner flange, *d'*, at the bottom end of the head D, forms an annular bearing for the spindle A^2. A slot in one side of this annular bearing permits the dowel *a*, (which projects from the side of the spindle A^2, as shown clearly in fig. 4,) to pass vertically through the said flange, or to remain therein for the purpose hereinafter more clearly explained.

The operation of the drill-stock, thus constructed, is as follows: When the feed-screw is turned down in its socket or rest B, and pressure is thereby applied to the spindle A^2, as is customary, the action of such pressure upon the said spindle will cause it to force the elastic cushion up toward the fixed head C^2, and thus relieve the pressure upon the drill-point, the said elastic cushion forcing the spindle A^2 down on the drill with a constant force when the drill is moved forward, thereby enabling it to cut a continuous chip of uniform thickness, without exerting undue pressure upon the drill at any time. The thickness of the flange *d'* is such that if the pressure applied by the screw C at any time becomes too great, the dowel *a* will slip above the said flange and thus stop the further motion of the screw until the cutting of the drill shall have relieved such pressure, and the said dowel *a* will slide down automatically into the groove in the flange, to again communicate motion to it and to the feed-screw, when the spindle is again turned in the proper direction.

Having described my invention, what I claim is—

The combination of the feeding-screw C, with its head C^2, the sliding head C^1, the yielding cushion C^3, the drill-spindle A, with its dowel *a*, and the cylindrical head D, with its flange *d'*, substantially as described.

In testimony of which invention I hereunto set my hand in presence of—

JOHN GRAY.

Witnesses:

M. RANDOLPH,

CHAS. H. BOYLE.