

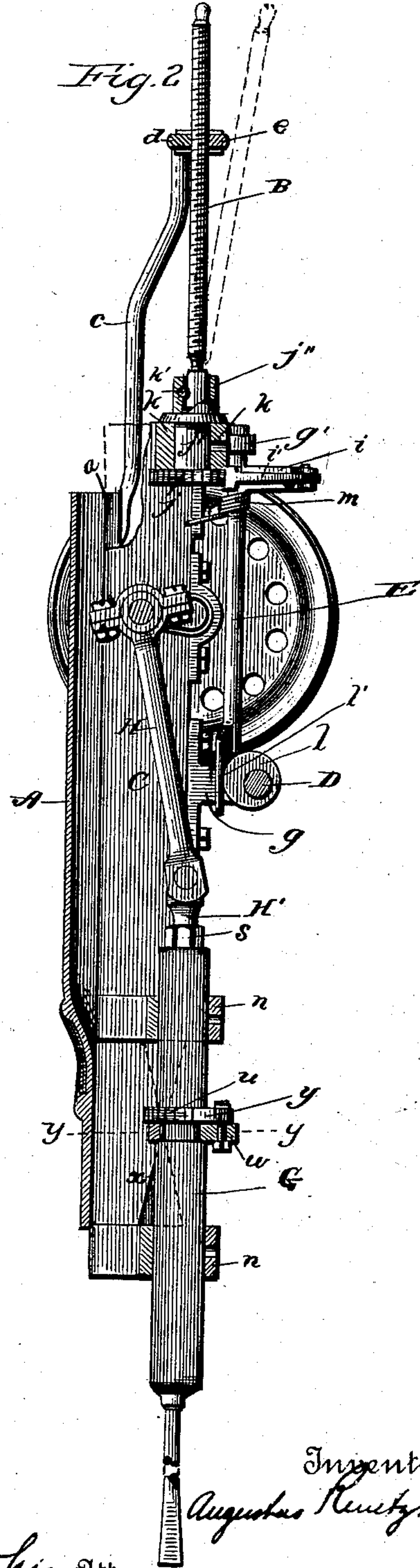
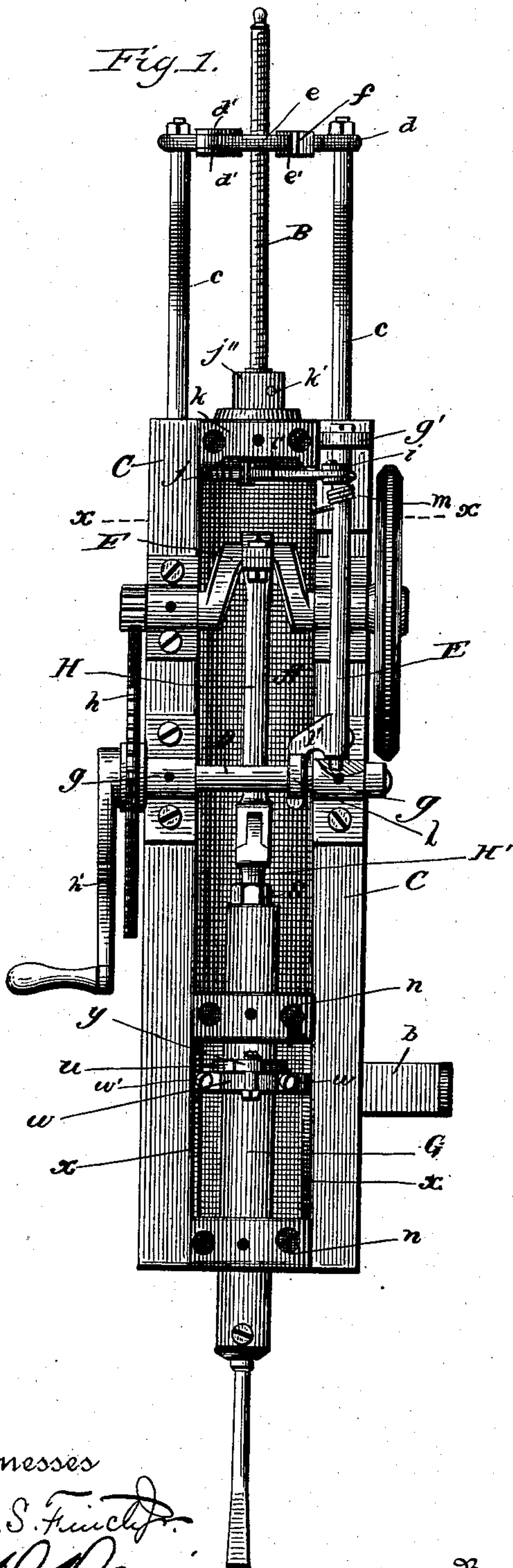
(No Model.)

2 Sheets—Sheet 1.

A. RENETZKY.
DRILL.

No. 407,688.

Patented July 23, 1889.



Witnesses
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C. H. Davis

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Augustus Renetzky
By *his* Attorney
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

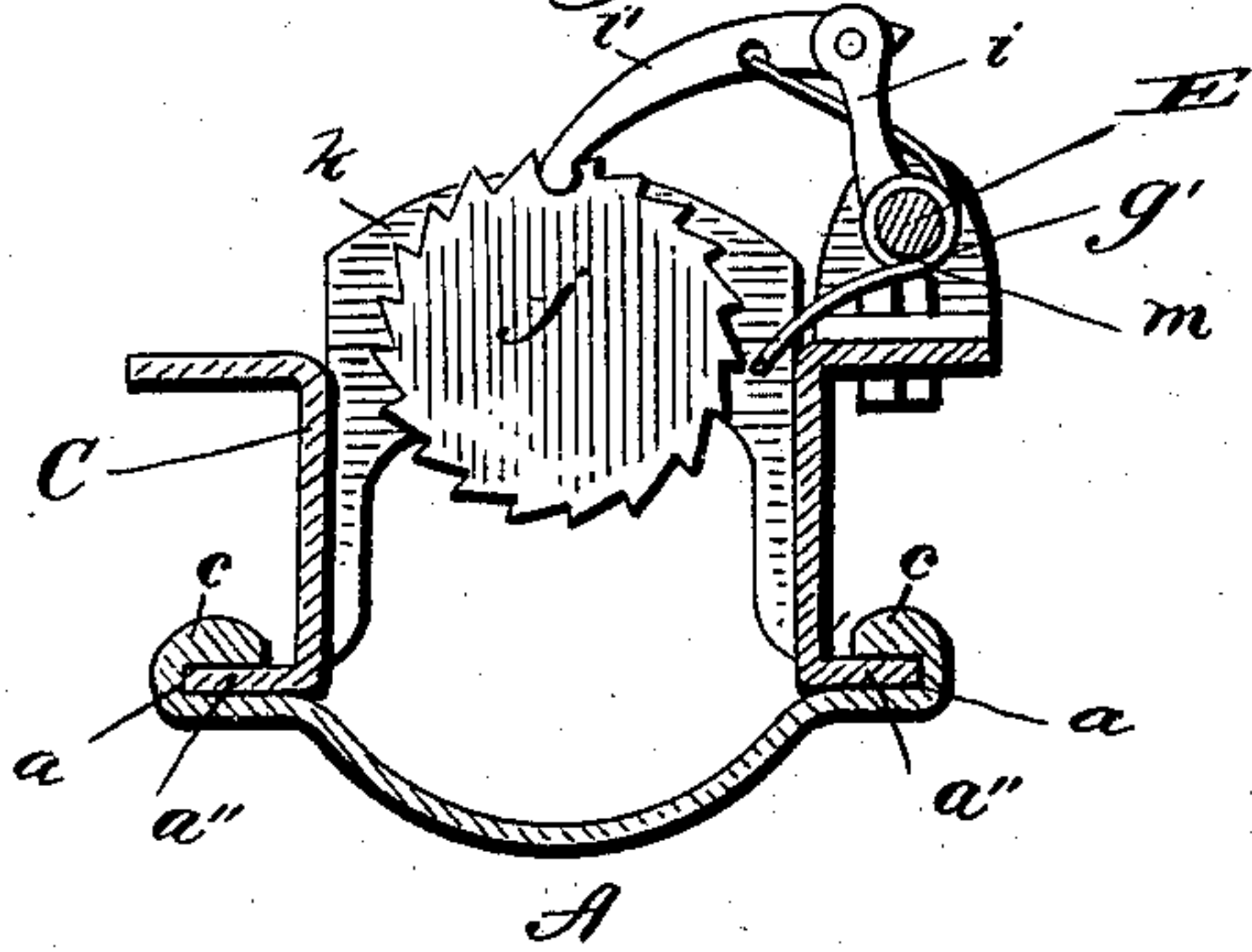


Fig. 4.

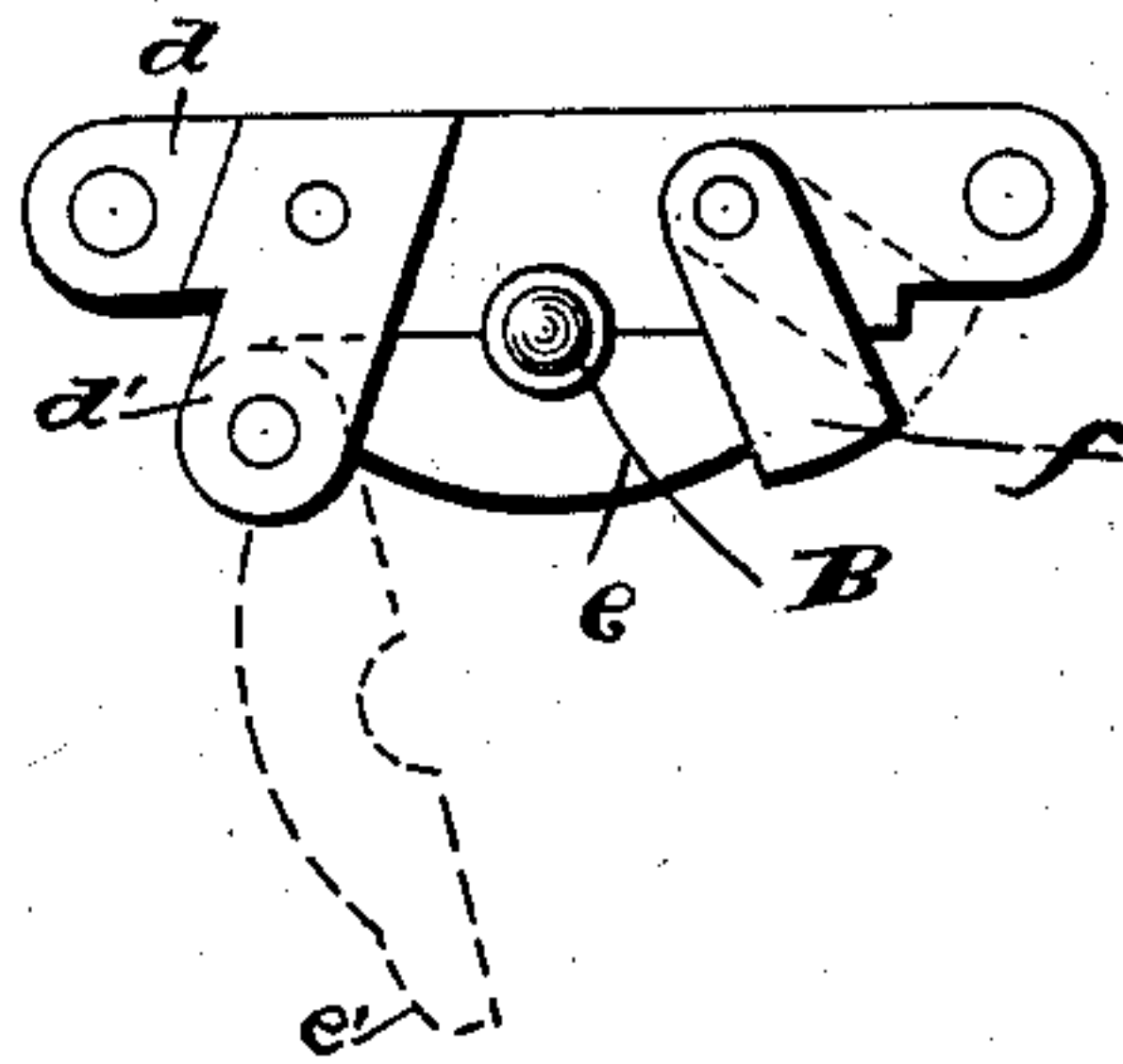


Fig. 5.

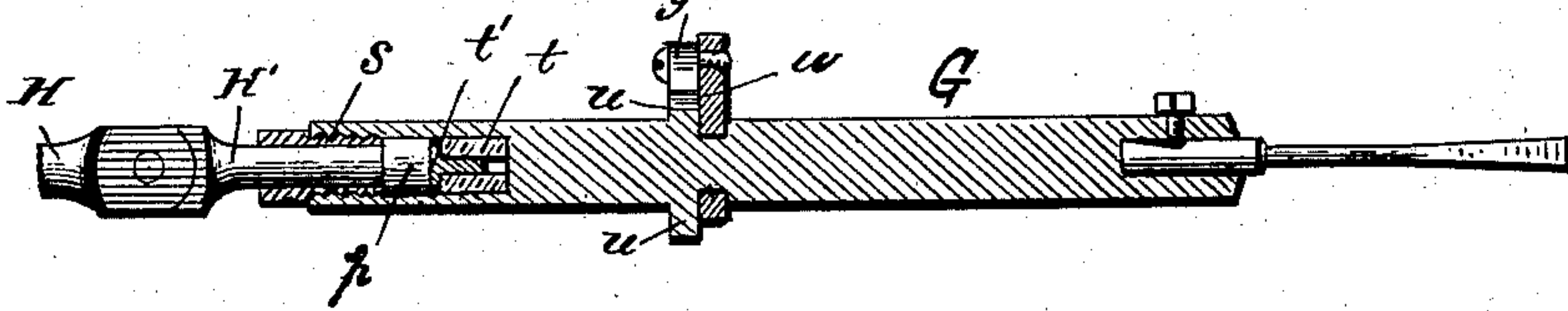


Fig. 6.

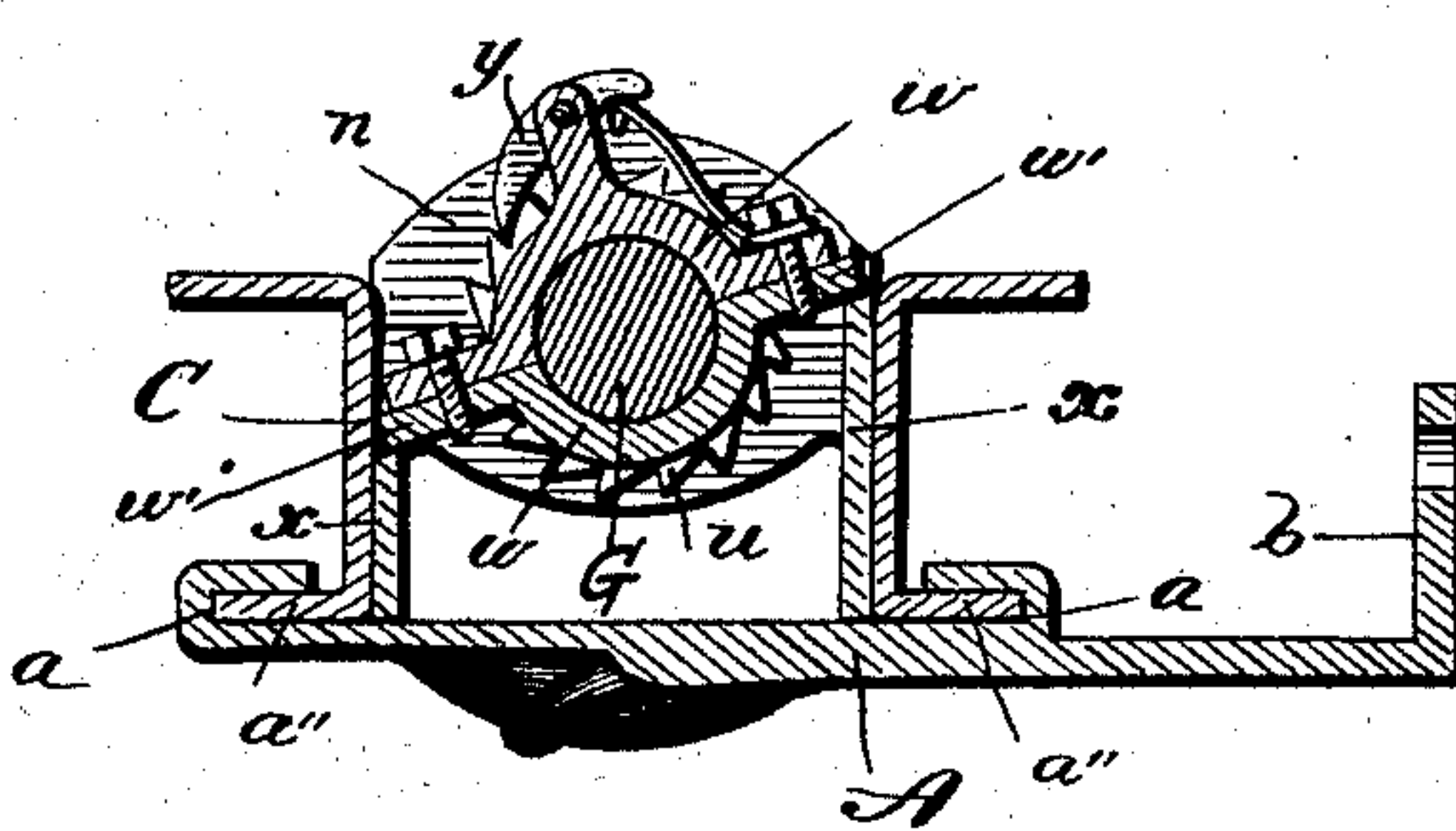
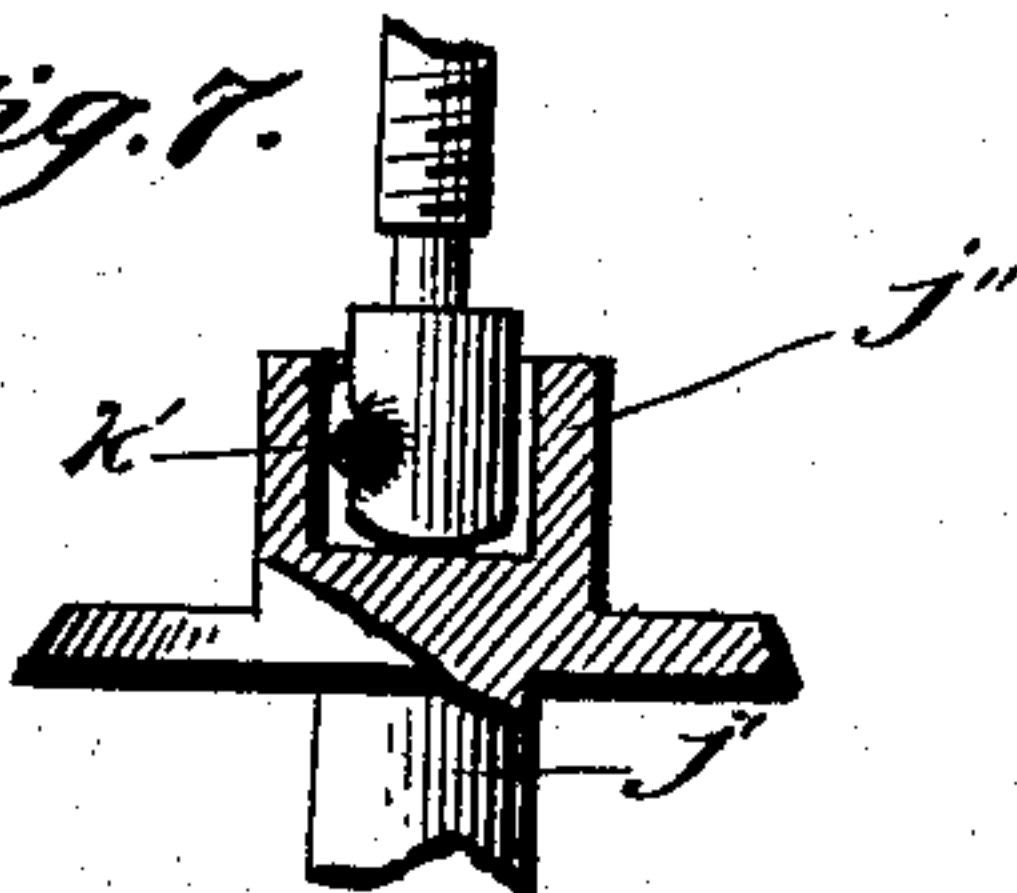


Fig. 7.



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UNITED STATES PATENT OFFICE.

AUGUSTUS RENETZKY, OF LINCOLN, ILLINOIS.

DRILL.

SPECIFICATION forming part of Letters Patent No. 407,688, dated July 23, 1889.

Application filed March 14, 1889. Serial No. 303,222. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS RENETZKY, a citizen of the United States, residing at Lincoln, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

In the accompanying drawings, Figure 1 represents a front elevation of my improved drill; Fig. 2, a vertical longitudinal sectional view of the same, a small portion of the upper part of the sliding frame being broken away to show attachment of the vertical arms to the stationary frame; Fig. 3, a transverse sectional view on the line $x x$ of Fig. 1, looking upward; Fig. 4, a plan view of the divided box attached to the upper ends of the vertical arms; Fig. 5, a longitudinal sectional view of the drill-holder; Fig. 6, a transverse sectional view on the line $y y$ of Fig. 2, and Fig. 7 a detail view showing connection of advancing screw to ratchet-wheel shaft.

The invention has for its object to provide improved and simple means for automatically revolving the drill during its reciprocatory movement, and for automatically advancing the drill, as will more fully hereinafter appear.

The invention also has other minor objects in view, which will fully appear in the course of this specification.

In the accompanying drawings, the letter A designates a suitable stationary frame provided with vertical ways $a a$ and a lateral arm b , by which latter the said frame may be secured to any suitable support. Attached to the upper end of the frame A are two vertical arms $c c$, slightly bent forward, and connecting the upper ends of these arms is a cross-bar d . This bar d has secured to or formed integral with it a pair of ears $d' d'$, between which is pivoted another bar e , having a beveled or rounded end e' . This pivoted bar e is adapted to fit close against the front side of the bar d and be clamped thereto by a loop f , pivoted upon the said bar d , this loop being adapted to be slipped over the rounded end of the pivoted bar and press against the same. The adjacent faces of the bars d and e are provided with internally-screw-threaded semicircular

grooves, which together form a vertical screw-threaded passage for the vertical screw B, attached to the sliding frame C. When it is desired to remove this screw B from between the bars, it is simply necessary to throw back the pivoted loop f , when the bar e will be free to swing out, as shown in dotted lines in Fig. 4.

The sliding frame C is provided with vertical flanges $a'' a''$, which fit and slide in the vertical ways a in the stationary frame. Journaled in bearings $g g$, secured to the face of the sliding frame, is the transverse drive-shaft D, which is provided with a suitable spur-wheel h and operating-crank h' . Having its lower end stepped in one of the bearings g and its upper end in a supplemental bearing g' is a vertical rock-shaft E, which is provided at or near its upper end with a horizontal forwardly-projecting arm i . Pivoted in the bifurcated end of this arm i is a spring-actuated pawl i' , which is held constantly in engagement with a ratchet-wheel j , secured to the lower end of a short vertical shaft j' , which latter is journaled in a divided box or bearing k upon the upper end of the sliding frame.

The shaft E is periodically operated by means of an eccentric l on the main shaft D, this cam impinging against the face of a finger l' , carried by the said rock-shaft.

The pawl i' is held constantly in engagement with the ratchet-wheel and the finger l' kept pressed against the eccentric l by means of a wire spring m coiled around the rock-shaft, one end of this spring resting against the sliding frame and the other end attached to the pawl, as shown in Fig. 3.

By reference to Fig. 2 it will be observed that the lower end of the screw B is rounded and inserted loosely in a socket j'' formed upon the upper end of the short flanged shaft j' and is pivotally secured therein by means of the horizontal pin k' , the pin passing through the socket and engaging a notch formed in the lower end of the screw. The object in thus pivotally attaching the vertical screw to the shaft is to permit the screw to be swung out from engagement with the box upon the ends of the vertical arms c , as shown in dotted lines in Fig. 2.

It will be observed that by means of the eccen-

tric, rock-shaft, pawl, and ratchet-wheel when the main shaft is rotated the vertical screw B will also be rotated. This rotation of the screw causes the sliding frame to be slowly
 5 advanced, as is evident. When the frame has advanced the required distance, the operator disengages the screw from its box in the manner heretofore described and draws the frame back and replaces the screw in the
 10 box ready for another operation.

Journalled in bearings secured to the face of the sliding frame is a transverse crank-shaft F, having secured to its respective ends a pinion and a fly-wheel, the pinion engaging
 15 the spur-wheel *h*. This crank-shaft is connected to the drill-holder G by means of a pitman H and a short rod H', this rod being pivotally connected to the lower end of the pitman.

20 The drill-holder consists, essentially, of a cylindrical rod or bar having removably secured in a socket in its lower end a suitable drill or chisel. This cylindrical bar is guided in its reciprocatory movements by means of
 25 suitable divided bearings *n n*, bolted to the sliding frame. The short connecting-rod H' is connected to the drill-holder by having formed on its end a head or enlargement *p*, the headed end of this rod being inserted in
 30 a cylindrical recess in the upper end of the drill-holder and held therein by means of a bushing *s*, tapped in the said cylindrical recess in the drill-holder, the lower end of the bushing bearing against the head on the end
 35 of the rod H', as shown in Fig. 5.

To cushion the jar of the drill, I interpose between the lower end of the rod H' and the bottom of the recess an elastic block *t*. I may, if found desirable, insert between the end of
 40 the rod and the cushion a metallic disk or washer *t'*, the disk being provided with a central pin which fits within a central passage in the cushion, as shown.

By connecting the pitman to the drill-
 45 holder in the above manner the latter is permitted to rotate freely in its bearings while it is being reciprocated. The drill-holder is rotated automatically by the following means: Secured to or formed integral with the holder,
 50 at a suitable point between its bearings, is a ratchet-wheel *u*, and alongside of this ratchet-wheel is an annular groove, in which is loosely

secured a divided collar *w*. The lateral projections *w'* of this divided collar rest and travel upon oppositely-inclined ways *x* upon
 55 the sides of the sliding frame, one way being placed upon either side of the drill-holder. Pivoted to an ear formed upon the divided collar is a spring-actuated pawl *y*, held in constant engagement with the adjacent ratchet-
 60 wheel. It will thus be perceived that as the collar is partially rotated by the inclined ways the pawl will engage one of the teeth of the ratchet-wheel and carry the drill-holder
 65 around with it, and as the collar is rotated in the reverse direction by the reverse movement of the holder the pawl will automatically ride or slip back to the next tooth of the wheel, ready for another operation, and so on,
 70 the drill-holder being kept constantly rotating in the same direction so long as the drilling operation is continued.

Having thus fully described my invention, what I desire to secure by Letters Patent is—

1. The combination of stationary and sliding frames, a divided box upon the former,
 75 a short shaft journaled in the sliding frame and provided with a ratchet-wheel, a screw pivotally attached to the said short shaft and clamped between the said divided box, and a
 80 rock-shaft and pawl for operating the said ratchet-wheel, as described.

2. The combination of the drill-holder G, recessed at its upper end, a headed connecting-rod H', inserted in the said recess, a
 85 bushing *s*, tapped into the said recess, a cushion interposed between the headed end of the rod H' and the bottom of the said recess, and a metallic washer inserted between the cushion and headed end of rod H', as and for the
 90 purpose set forth.

3. The combination of a cylindrical drill-holder and mechanism for reciprocating it, a ratchet-wheel secured to the said holder, a divided collar upon the said holder, a spring-
 95 actuated pawl engaging the said ratchet-wheel, and reversely-inclined ways for rotating the said collar, substantially as described.

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

AUGUSTUS RENETZKY.

Witnesses:

ADAM DINGER,
 W. H. RIGDON.