(No Model.) 3 Sheets—Sheet 1.

S. G. RYDER.

MACHINE FOR CLEARING TWIST DRILLS.

No. 350,214. Patented Oct. 5, 1886.

Fig. 1.

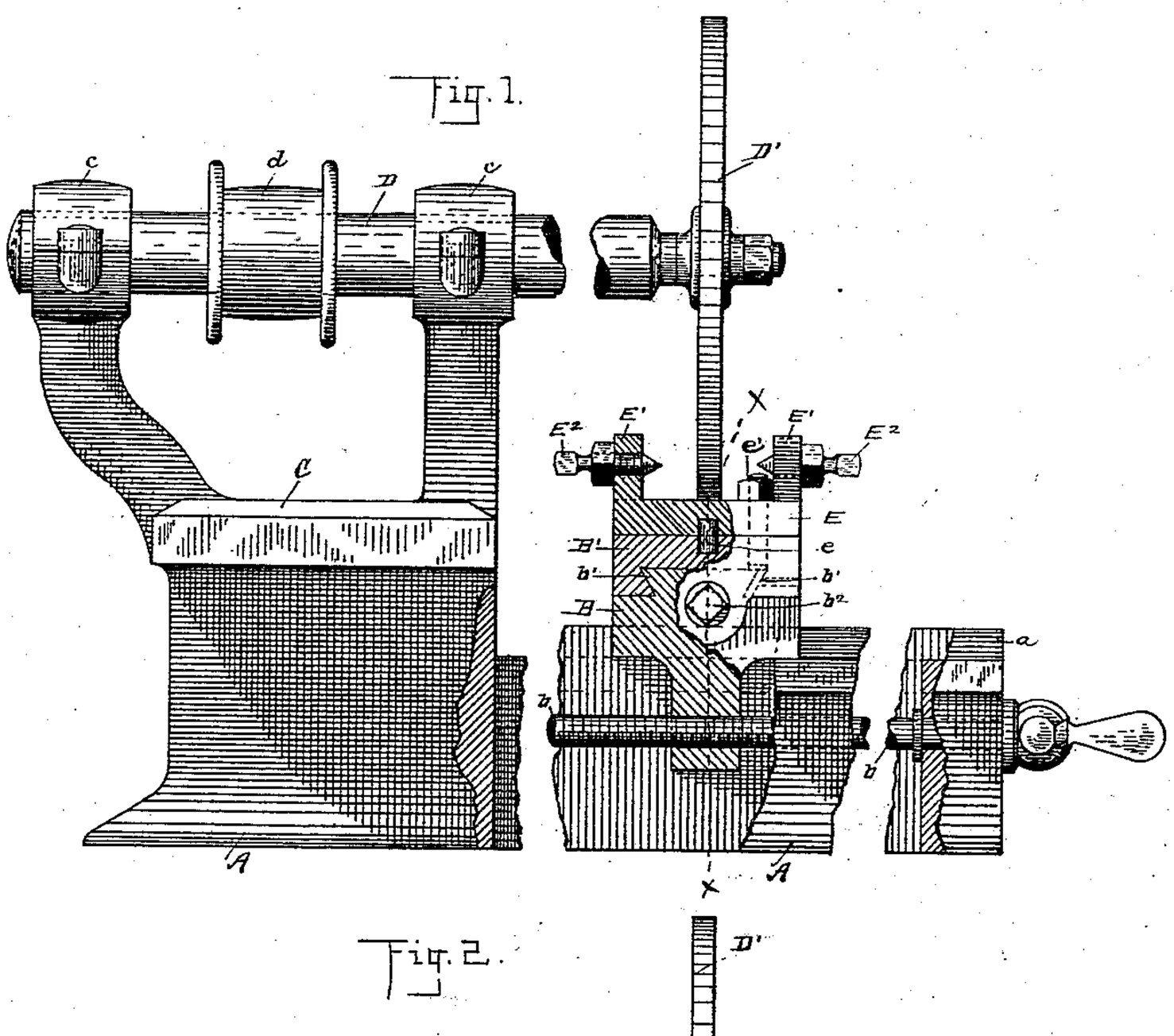
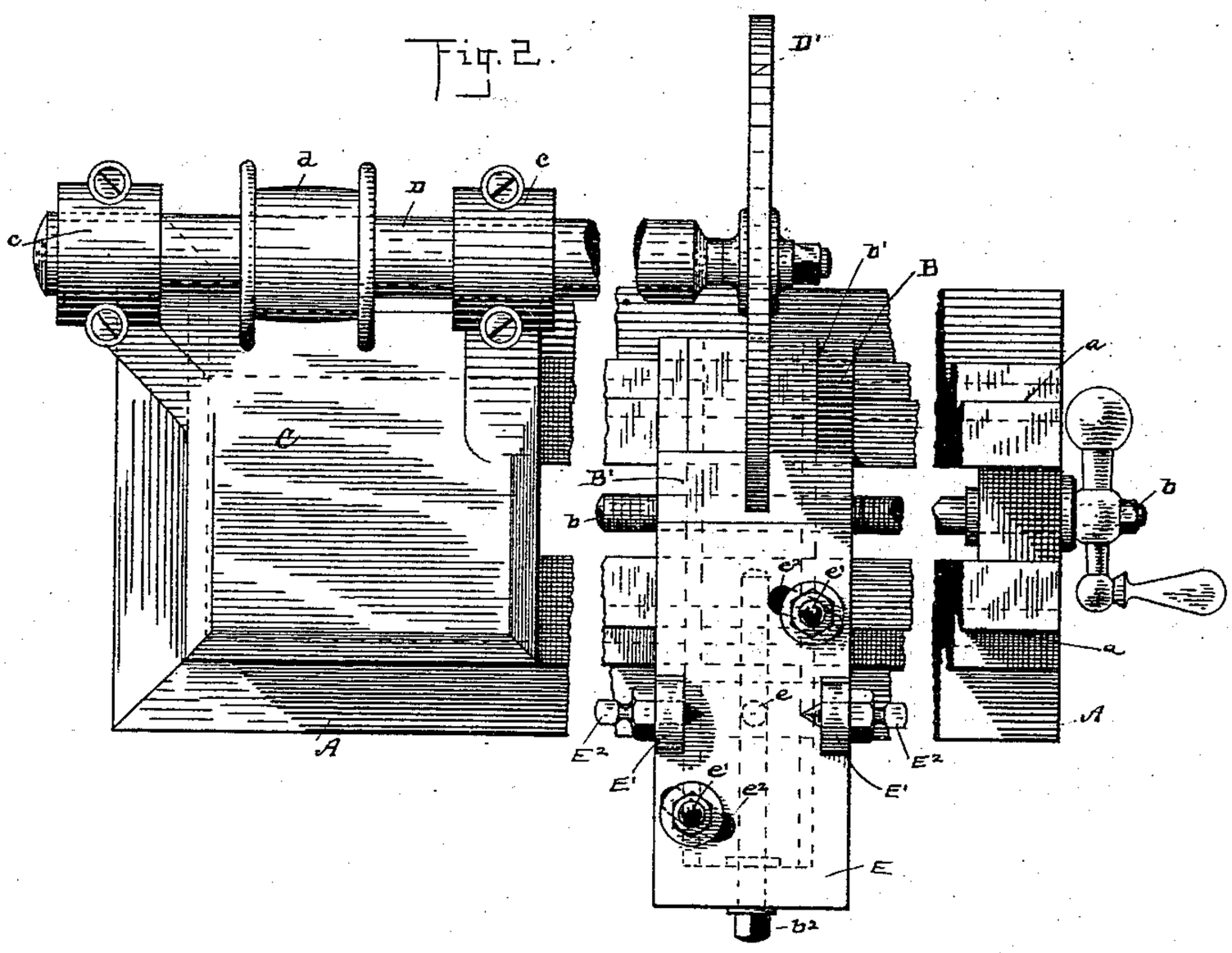


Fig. 2.



WITNESSES

N. S. Amstutz.

G. W. Shumway

S. G. Ryder. INVENTOR

By Jno. Crowell

Attorney

(No Model.) 3 Sheets—Sheet 2.

S. G. RYDER.

MACHINE FOR CLEARING TWIST DRILLS.

No. 350,214. Patented Oct. 5, 1886.

Fig. 3.

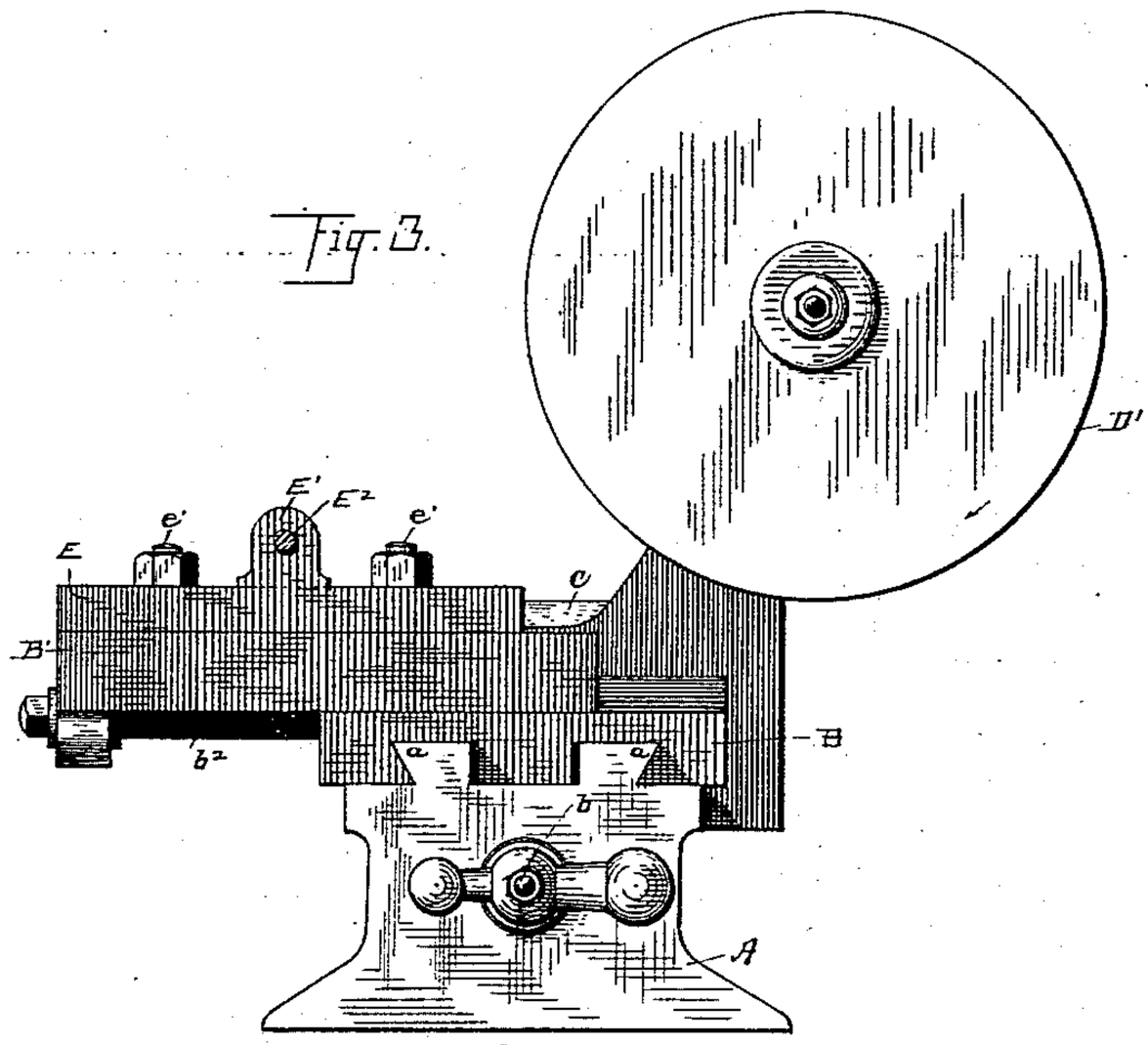
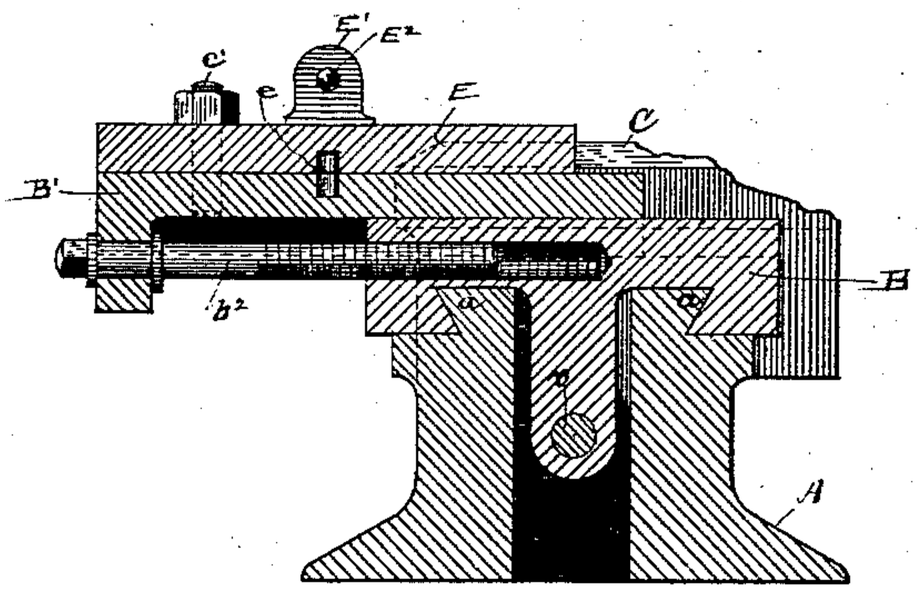


Fig. 4



WITNESSES
W. S. Ametuty
G. W. Sherman

S. G. Ryder. INVENTOR
By Jno. A. Crowell Attorney

(No Model.)

3 Sheets—Sheet 3.

S. G. RYDER.

MACHINE FOR CLEARING TWIST DRILLS.

No. 350,214. Patented Oct. 5, 1886.

Fig. 5.

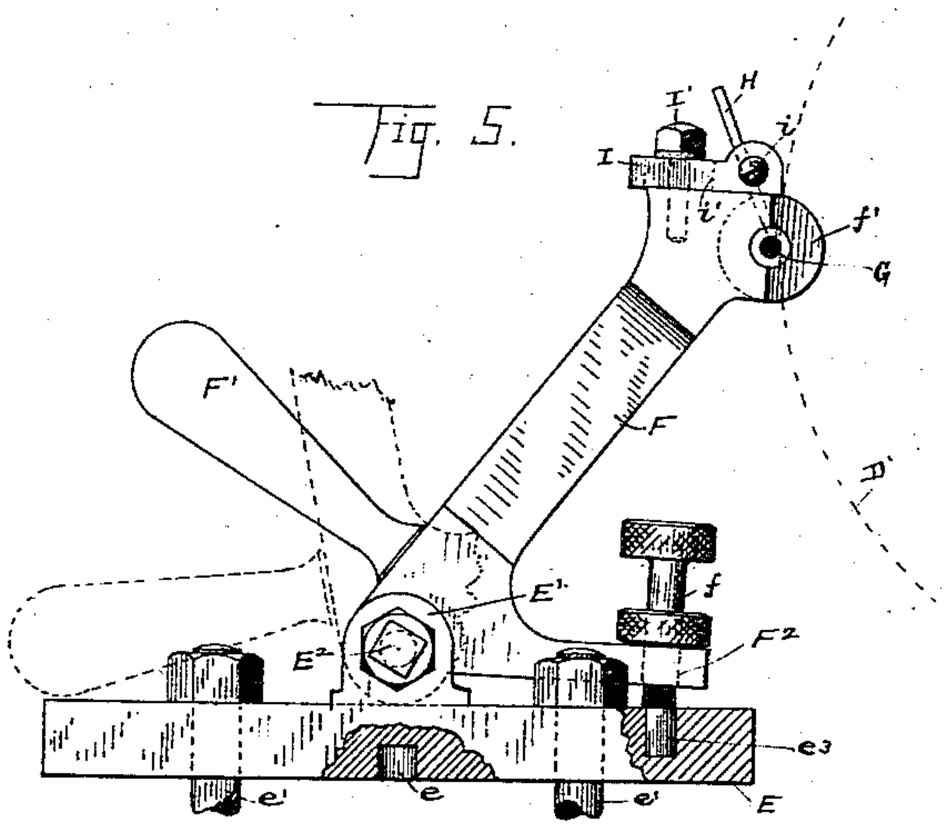


Fig. 6.

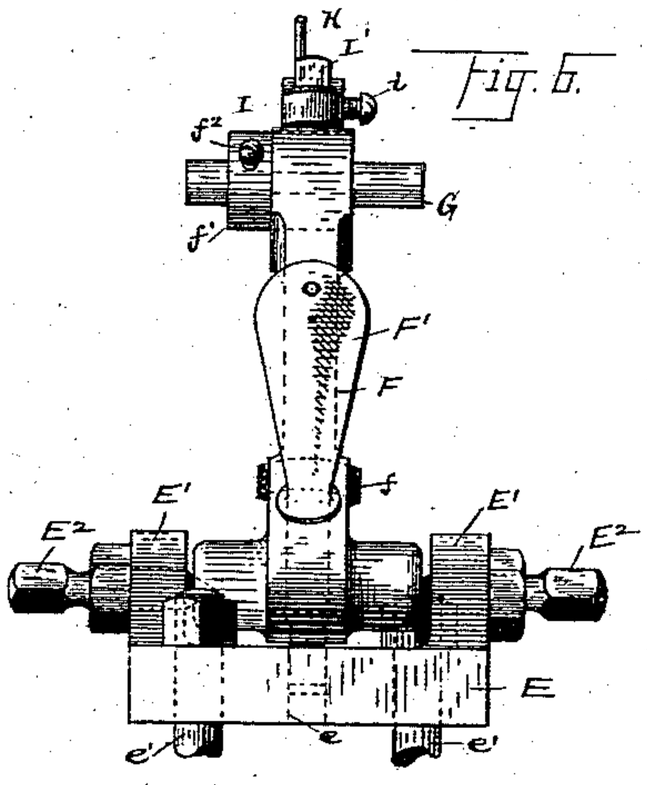


Fig. 7.

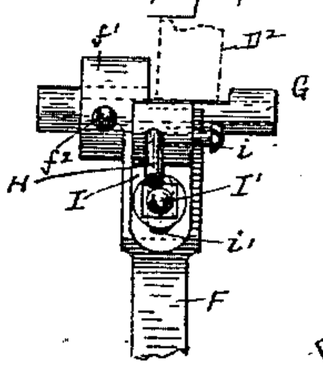


Fig. 8.

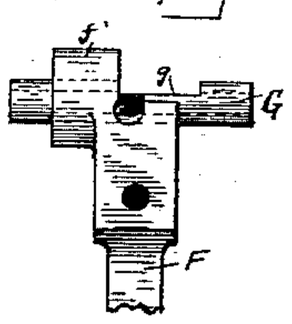


Fig. 9.

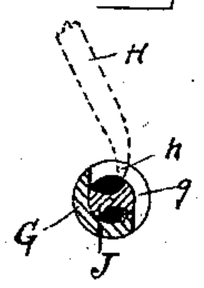


Fig. 11.

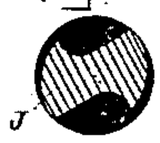


Fig. 10.

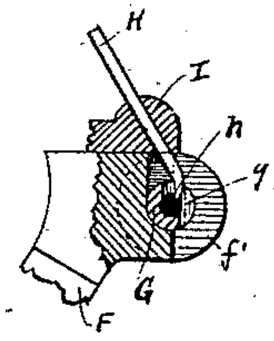


Fig. 12.

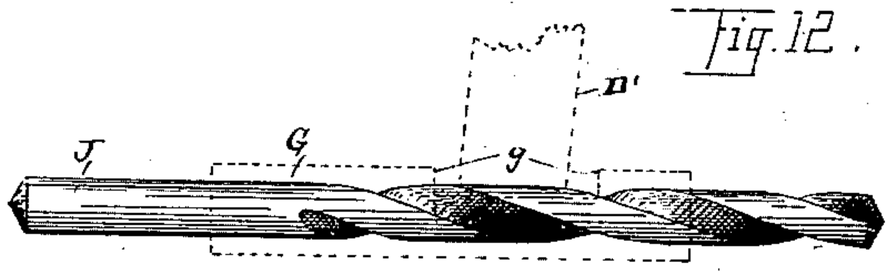
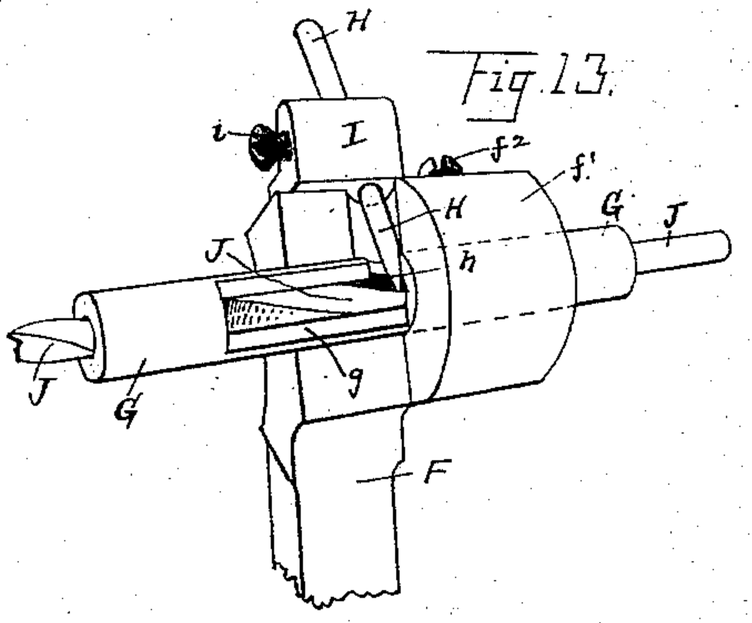


Fig. 13.



WITNESSES

W. S. Austin.
E. W. Sherman

INVENTOR

S. G. Ryder.

By Jno. A. Crowell
Attorney

UNITED STATES PATENT OFFICE.

SUMNER G. RYDER, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD TOOL COMPANY, OF SAME PLACE.

MACHINE FOR CLEARING TWIST-DRILLS.

SPECIFICATION forming part of Letters Patent No. 350,214, dated October 5, 1886.

Application filed October 29, 1885. Serial No. 181,338. (No model.)

To all whom it may concern:

Be it known that I, SUMNER G. RYDER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Clearing Twist-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 an improved grinding apparatus for clearing twist-drills; and it consists in certain features of construction and in combination of parts, hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved grinding-machine, portions being broken away to show the internal construction. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation. Fig. 4 is an elevation in transverse section on the line of *x x*, Fig. 1. Figs. 5 and 6 are enlarged views in elevation respectively of the end and front sides of the drill-holder and attachments. Figs. 7 and 8 are top plan views of the drill-holder, the former showing the guide-holder attached and the latter with the guide-holder removed. Fig. 9 is an enlarged transverse section of the drill-socket or bushing and guide. Fig. 10 is a transverse section of the bushing and support, showing also the drill-guide, but with the drill removed. Fig. 11 is a transverse section of the drill after the clearance has been ground. Fig. 12 is a plan view of a drill, showing the relative position of the emery-wheel in grinding. Fig. 13 is a view in perspective of the drill-socket and guide from the rear.

A represents the bed-plate of the machine, that is provided with dovetail ways *a*, running lengthwise of the bed-plate. On the ways *a* is mounted the carriage B, that is moved on said ways by the screw *b*.

C is a head-block, that is provided with suitable boxes, *c*, in which is journaled the emery-wheel spindle D. This spindle has a driving-pulley, *d*, and on the overhanging end of the spindle is mounted the emery-wheel D′. The carriage has dovetailed ways *b′*, running transversely with the bed, and on these ways is mounted the plate B′, that is moved on the ways *b′* by the screw b^2. On the plate B′ rests the plate E, and is pivoted to the former at *e*, and is secured by bolts *e′*, that pass through segmental holes e^2, by means of which arrangement the plate E may be turned on its axis to a limited extent to enable the emery-wheel to engage the rear or non-cutting edge of the spirals on the drills. The plate E has upwardly-projecting ears E′, that have screw-threaded holes for engaging the conical-ended pivoted screws E^2, on which latter is pivoted the tool-stock F, the axis of the latter being lengthwise of the machine, so that the swinging movement of the tool-stock is forward and rearward. (See solid and dotted lines, Fig. 5.) The tool-stock has a handle, F′, for operating the same, and a rearwardly-projecting arm, F^2, through a threaded hole in which passes the stop-screw *f*. The end of the screw *f* abuts against the plug e^3, set in the slide E. The ends of the plug and stop-screw are hardened to prevent wear. The stop-screw is provided in the usual manner with a thumb-piece and thumb jam-nut, so that the same is easily adjusted and secured. The abutment of this screw against the plug limits the movement of the tool-stock rearward or toward the emery-wheel, and the stock being inclined a vertical adjustment of the work is also had. The upper or free end of the tool-stock has a hub, *f′*, of considerable size, with a central bore running parallel with the axis of the tool-stock, in which bore a holder or bushing, G, is placed and secured by a set-screw, f^2. As many holders or bushings are required as there are different sizes of drills; but by making all the holders or bushings of the same external diameter the machine can be employed for clearing any size twist-drill. The bushing is cut away at *g* on the rear side, so as to expose a portion of the drill for the engagement of the emery-wheel.

H is the guide-pin, with a curved pointed end, *h*, (shown more clearly in Figs. 9, 10, and 13,) for entering the spiral grooves of the drill. The pin is secured in the holder I by the set-screw *i*. The holder is secured to the tool-stock by the screw I′.

In operating the device a holder or bushing, G, having a bore to fit the sized drills that are to be ground, is arranged in the hub *f′*. A

drill, *j*, is placed in position in the holder or bushing G, and the part *h* of the pin H is introduced into a spiral groove of the drill. By means of the adjusting mechanism already described the parts are adjusted so that the emery-wheel will engage the rear or non-cutting edge of the spiral of the drill. The operator moves the drill endwise by hand, and the engagement of the pin H rotates the drill, so that the back edge of the spiral is ground away. If the drill is of any considerable size, several cuttings are required to grind the clearance, and the screw b^2 is turned a trifle with each pass of the drill to feed the work toward the emery-wheel. When the clearance is properly ground on the one spiral, the stop *f* is adjusted, so that the next spiral and any number of other drills may be ground to exactly the same shape.

Heretofore, in place of the guide-pin H, a spring was employed for this purpose. The objection to such spring is that if the latter be of slight tension it will recoil more or less and not guide the drill accurately, and if the tension is increased it causes the drill to move hard. With my improved device, the curved end *h* of the guide-pin fitting the side of the spiral, and the friction of the wheel revolving toward the drill on its lower side, presses the drill against the pin, which pin, being rigid, causes the drill to be drawn out against the guide easily and accurately by the hand, therefore doing away with any chuck or holder or steadying device. A straight pin can be used as a guide when the drill is large enough, so that the grooves are of sufficient size and admit the same. By reason of the block I being held by a single bolt, I′, and by means of the slot *i′*, through which the bolt passes, the block I may be moved forward or rearward, or turned a trifle to the one side or the other, to bring the point *h* of the guide-pin in just the position to engage the spiral of the drill when the latter is in position to be engaged properly by the emery-wheel.

What I claim is—

1. In a machine for clearing twist-drills, the combination, with a drill-stock connected to the carriage by a pivotal joint, a drill-holder detachably and adjustably secured in said stock by a set-screw, of a guiding-pin adjustably connected with said stock, the parts being arranged substantially as set forth.

2. The combination, with the pivoted drill-stock F, provided with a cylindrical hub, of a drill-holder or bushing detachably secured in the hub of said drill-stock, said drill-holder having a notch or recess opposite the emery-wheel, the parts being arranged substantially as set forth.

3. The combination, with the pivoted stock F and drill-holder G, of a guide-pin for engaging the spiral of the drill, and mechanism, substantially as indicated, for adjusting said guide-pin and holding the pin rigidly to its engagement with the drill, substantially as set forth.

4. In a drill-clearing machine provided with a swinging drill-stock, the combination, with said drill-stock having a cylindrical hub connected therewith, interchangeable bushings for said hub, each bushing having a bore to fit respectively different-sized drills, of a guide-pin for engaging the spiral groove of the drill and adjustably connected with the drill-stock, and means, substantially as described, for rigidly holding the guide-pin to its work, and an emery-wheel to revolve toward the cutting-edge of drill, substantially as set forth.

5. In a drill-clearing machine provided with a swinging drill-stock, the combination, with said drill-stock having a cylindrical hub connected therewith, interchangeable bushings for said hub, each bushing having a bore to fit re-respectively different-sized drills, of a guide-pin, the latter having a curved end for engaging the spiral groove of the drill and adjustably connected with the drill-stock, and means, substantially as described, for rigidly holding the guide-pin to its work, and an emery-wheel to revolve toward the cutting-edge of drill, substantially as set forth.

6. In drill-clearing machines, the combination, with a drill-stock, the same being pivoted to a carriage, of mechanism, substantially as described, for elevating or depressing the work, the parts being arranged substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 21st day of October, 1885.

SUMNER G. RYDER.

Witnesses:
G. W. SHUMWAY,
N. S. ARNSTUTZ.