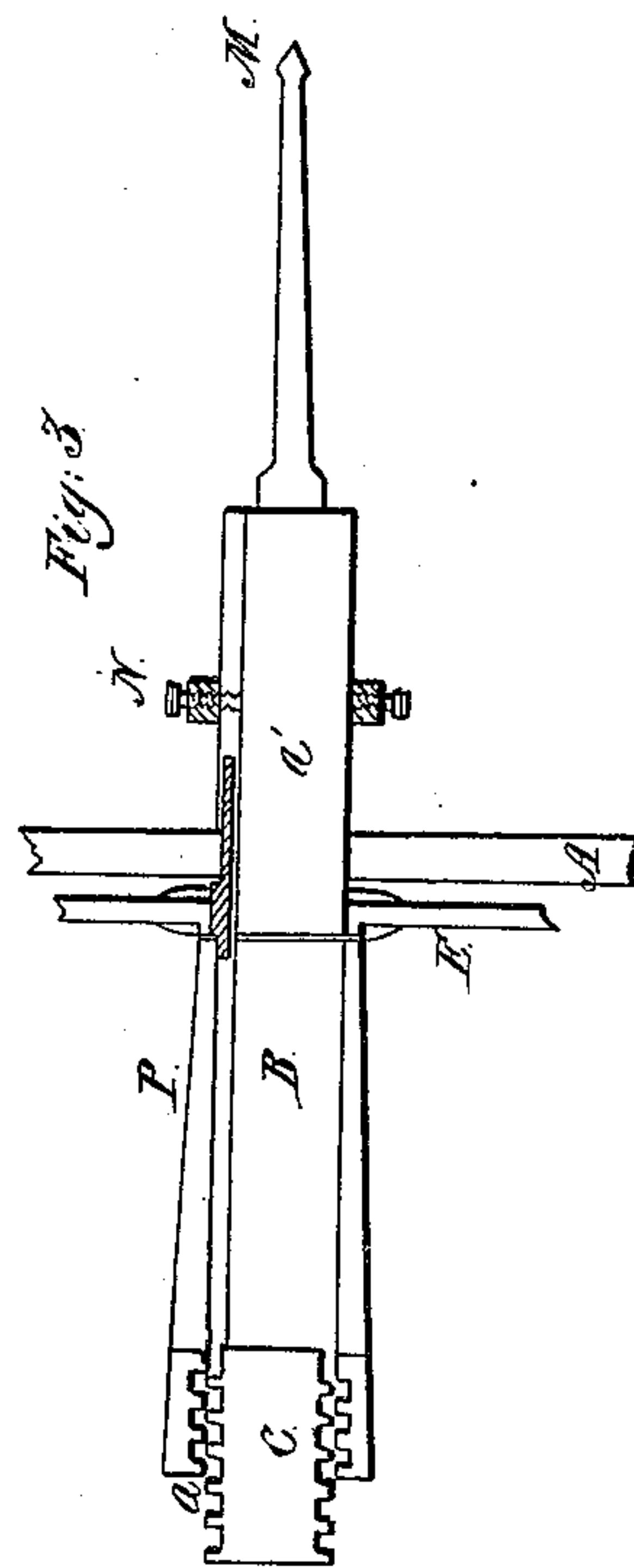
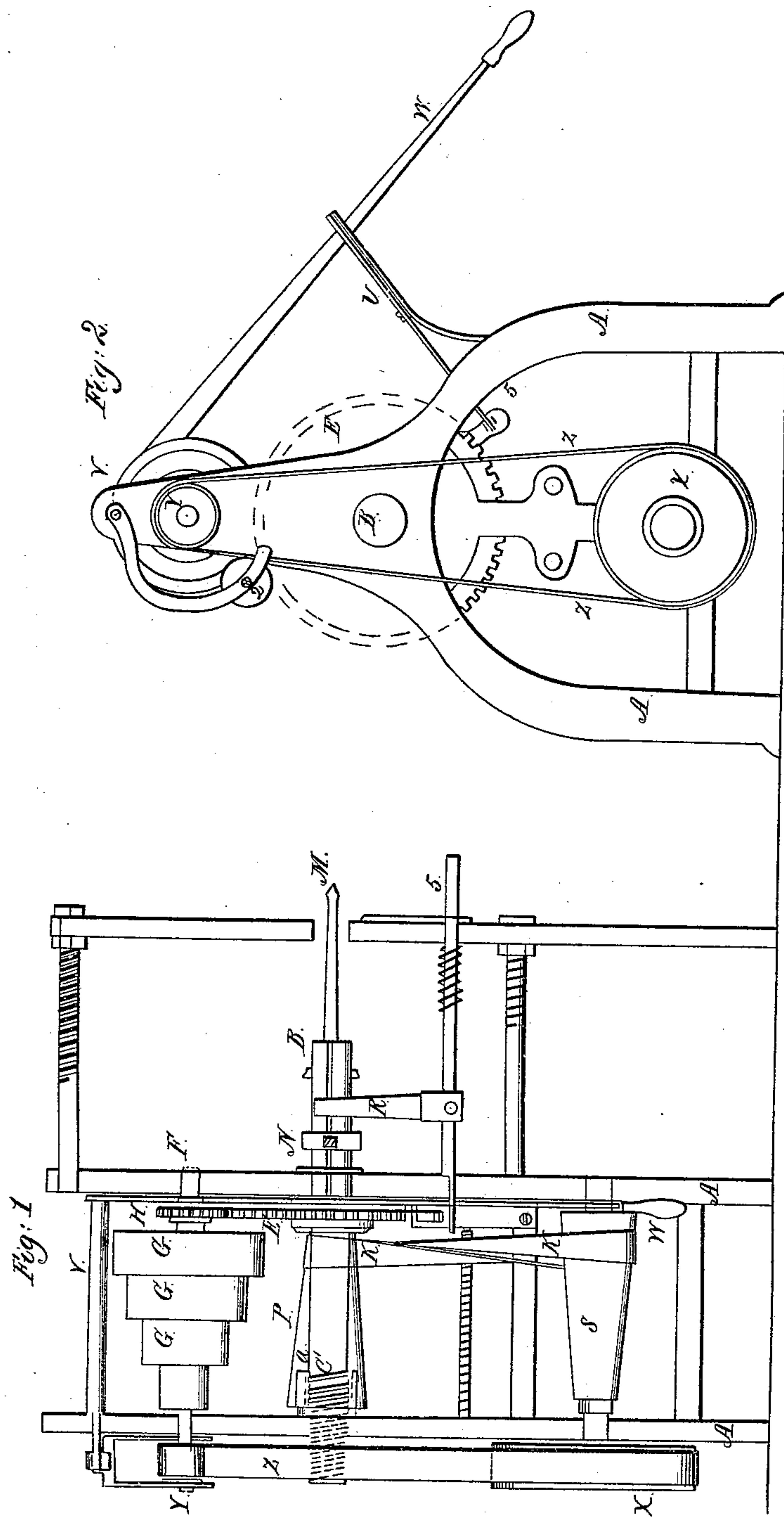


J. P. Heacock,

Metal Drill,

No. 13,845,

Patented Nov. 27, 1855.



UNITED STATES PATENT OFFICE.

JOEL P. HEACOCK, OF MARLBORO, OHIO.

DRILLING AND SCREW-CUTTING MACHINE.

Specification of Letters Patent No. 13,845, dated November 27, 1855.

To all whom it may concern:

Be it known that I, JOEL P. HEACOCK, of Marlboro, in the county of Stark and State of Ohio, have invented a new and useful
5 Improvement in Machinery for Boring, Drilling, and Screw-Cutting; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying
10 drawings, making a part of this specification.

Figure 1, is a longitudinal vertical section of my improvement; Fig. 2, an end view, and Fig. 3 is section on an enlarged
15 scale of the mandrel and sliding feather.

The improvement I present is for the purpose of boring, drilling or screw cutting, and consists in providing the mandrel carrying the bit, with a universal feed motion.
20 I also provide the machine with a self acting trip, for the purpose of retracting the mandrel and tool, with a more rapid motion than that of its advance.

The construction is as follows: A, A, represents a substantial frame; B, a shaft or mandrel, on one end of which a screw C', is cut, working in a nut or female screw, secured in a cone pulley P.

E is a spur wheel fitting on mandrel B, and turning therewith by means of the sliding feather *a*; (see Fig. 3;) a short distance above B, is the shaft F, mounted in suitable bearings in the frame. It carries the pinion H; it also carries a set of pulleys G,
35 G, G. The power is applied by band to one of these pulleys.

M represents a drill or other tool, if used for drilling or boring: (if for screw cutting a male tap is substituted).

40 S, is a cone pulley, on the shaft carrying the lower pulley X; and P is one above it; K, a crossed strap extending from S, to P. It is movable, by a shaft bar for the purpose of changing the relative speed of the pulleys, in different grades of feed.
45

N is a set ring, secured by set screws fastening it at any desired distance while the depth of boring is regulated by R, a catch fastened to a sliding bar 5, by set screws.
50 On said bar is a helical spring to return the bar to its position.

The operation is as follows: Movement being given by strap or band to pulley G, the pinion H on its shaft actuates the spur
55 wheel E, secured on the mandrel B, and by

this means the tool thereof is turned. To advance the tool, (say a bit M, for boring metal), the strap Z is tightened on its pulleys Y, and X by means of the lever W, rock shaft V, and swung pulley 2. By
60 this means the cone pulley, on the shaft carrying X, actuates the sliding strap K; it drives the sleeve cone P. Said cone carries at the larger end a female nut *a* corresponding with the male screw C', on mandrel shaft B. By these several devices the
65 mandrel and tool is advanced any required distance, then the set ring N, is brought in contact with the catch R, and the sliding rod 5 thereof draws the lower end of the
70 upright lever V, to the right, and consequently withdraws the upper end from under the weighted lever W, and it falls by its gravity; thus slacking the strap Z, and
75 arresting the movement of the pulleys and the feed. The proportion of the drum X and pulley V is the same as the gear H and E. Consequently their movement would be alike if uncontrolled, that is if a pair of plain
80 pulleys were substituted for P and S, but as they are coned and the sliding strap K, is made to approach the small end of P, and large end of S, the speed of P is increased and thus the feed is given, and it
85 is owing also to this difference of speed that the release or unlocking of the feather *a*' is obtained.

To retract the mandrel and tool, it being noticed that the cone P, and nut therein is held still by the adhesion of the crossed
90 strap K the gear H and E actuate the mandrel and the male screw thereon working in the nut, brings back the ring N until it comes in contact with the end of the feather
95 *a*' (said feather passing freely through the spur E' as a clutch) and clamps or compresses the feather against the end of cone P, thus locking it and causing its movement as first described.

By throwing off the strap X there will be
100 no feed given the mandrel although the two cone pulleys still turn by the clamping effect of the set ring, but the moment the strap is tightened the clamping effect ceases by the speed of P, being greater as before
105 observed.

It is further to be noticed that in this machine by virtue of the adjustable set catch R and ring N or its equivalent a control in
110 projecting the mandrel is obtained, while I

also perfectly control the distance of its retrograde movement, thus avoiding the necessity of feeding up in space where a cam and helical spring are used, as in a recent improvement.

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

The use of pulleys P and S, X and Y, set ring N operating conjointly on the feather

α' in the manner and for the purposes herein set forth.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

JOEL P. HEACOCK.

Witnesses:

WM. S. CLARK,
JOHN F. CLARK.