

S. BISBEE.
RAKE TOOTH-LATHE.

No. 178,587.

Patented June 13, 1876.

Fig. 1.

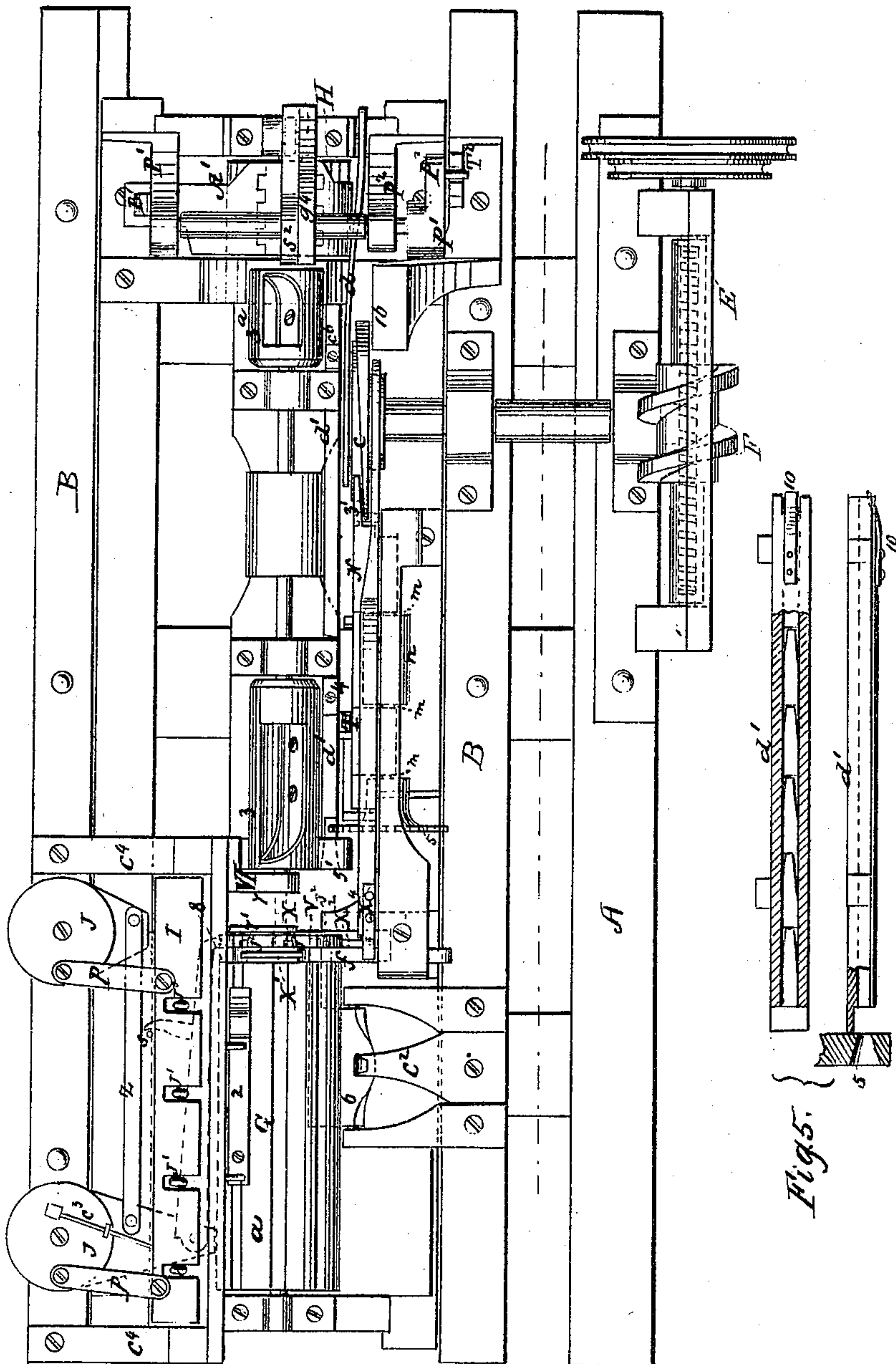


Fig. 5.

WITNESSES:

E. Woff.
J. Goethals

INVENTOR:

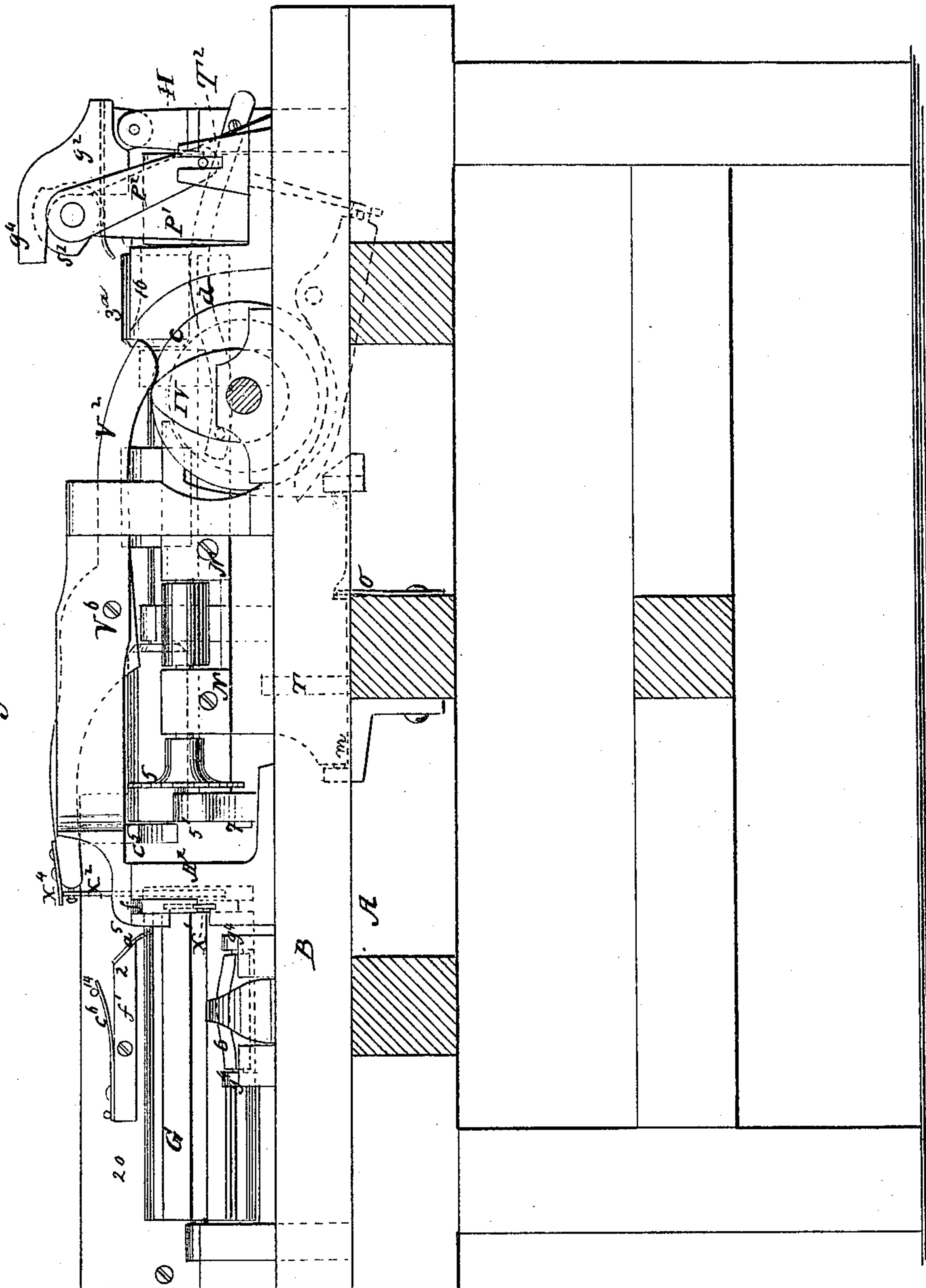
S. Bisbee
BY *Wm. L.*
ATTORNEYS.

S. BISBEE.
RAKE TOOTH-LATHE.

No. 178,587.

Patented June 13, 1876.

Fig. 2.



WITNESSES:

E. Wolff
J. Goethals

INVENTOR:

S. Bisbee
BY *mmu*
ATTORNEYS.

S. BISBEE.
RAKE TOOTH-LATHE.

No. 178,587.

Patented June 13, 1876.

Fig. 4.

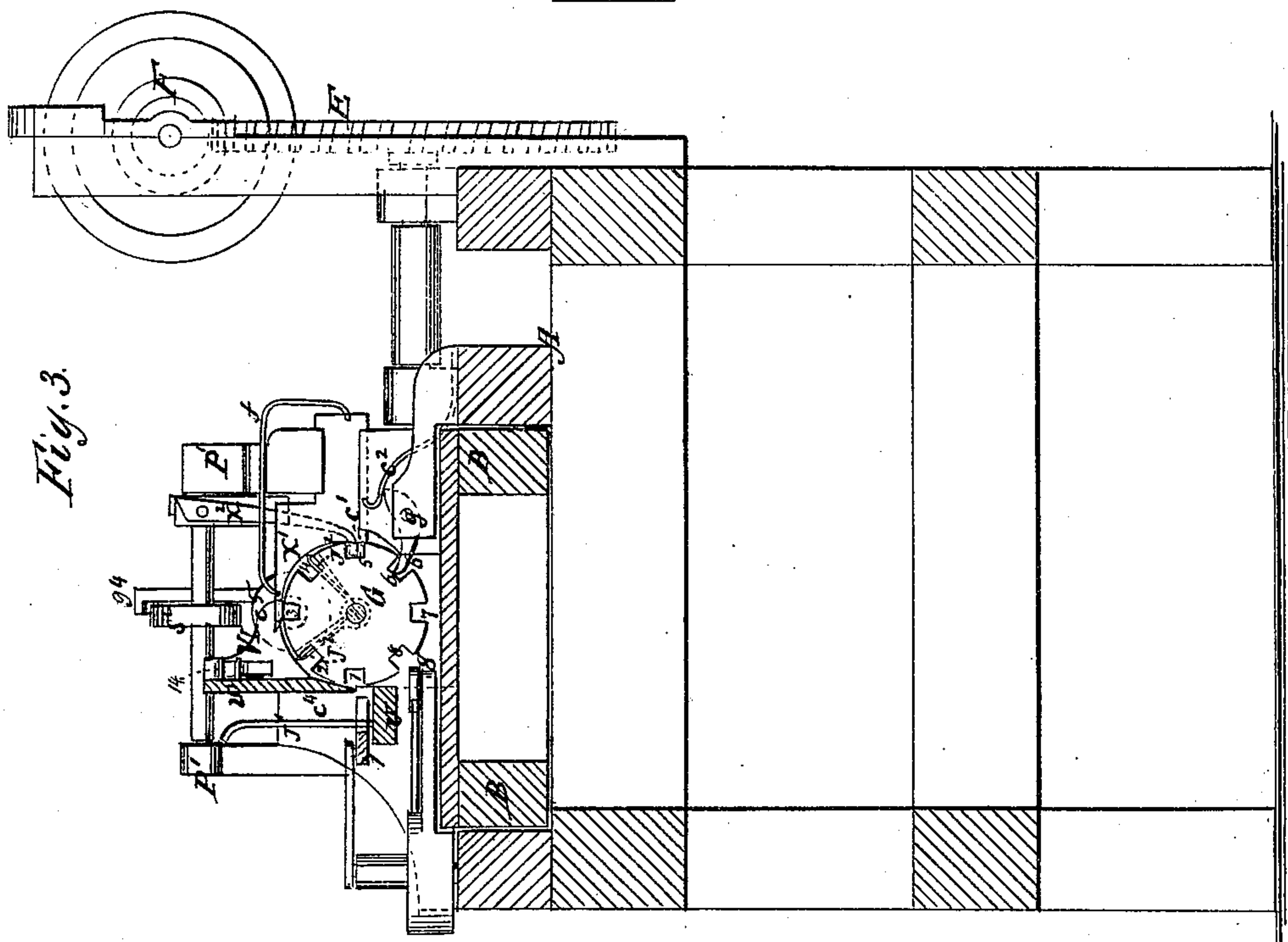
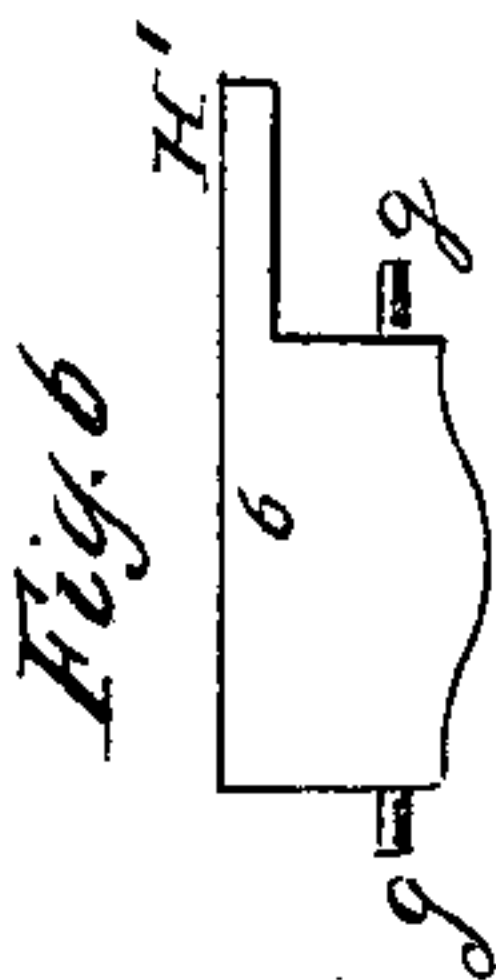
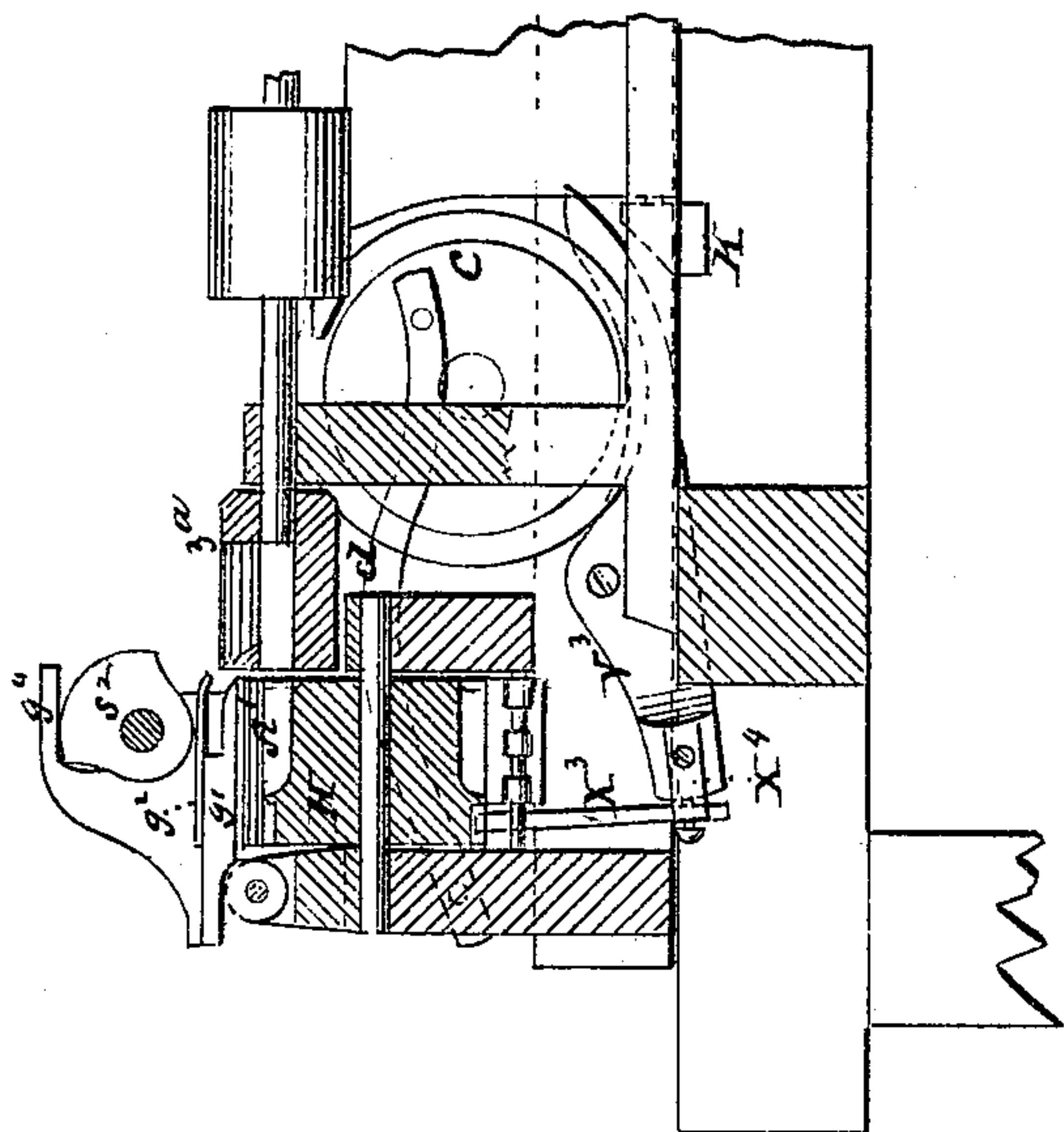


Fig. 3.

WITNESSES:

E. Wolff.
J. Goethals

INVENTOR:

S. Bisbee

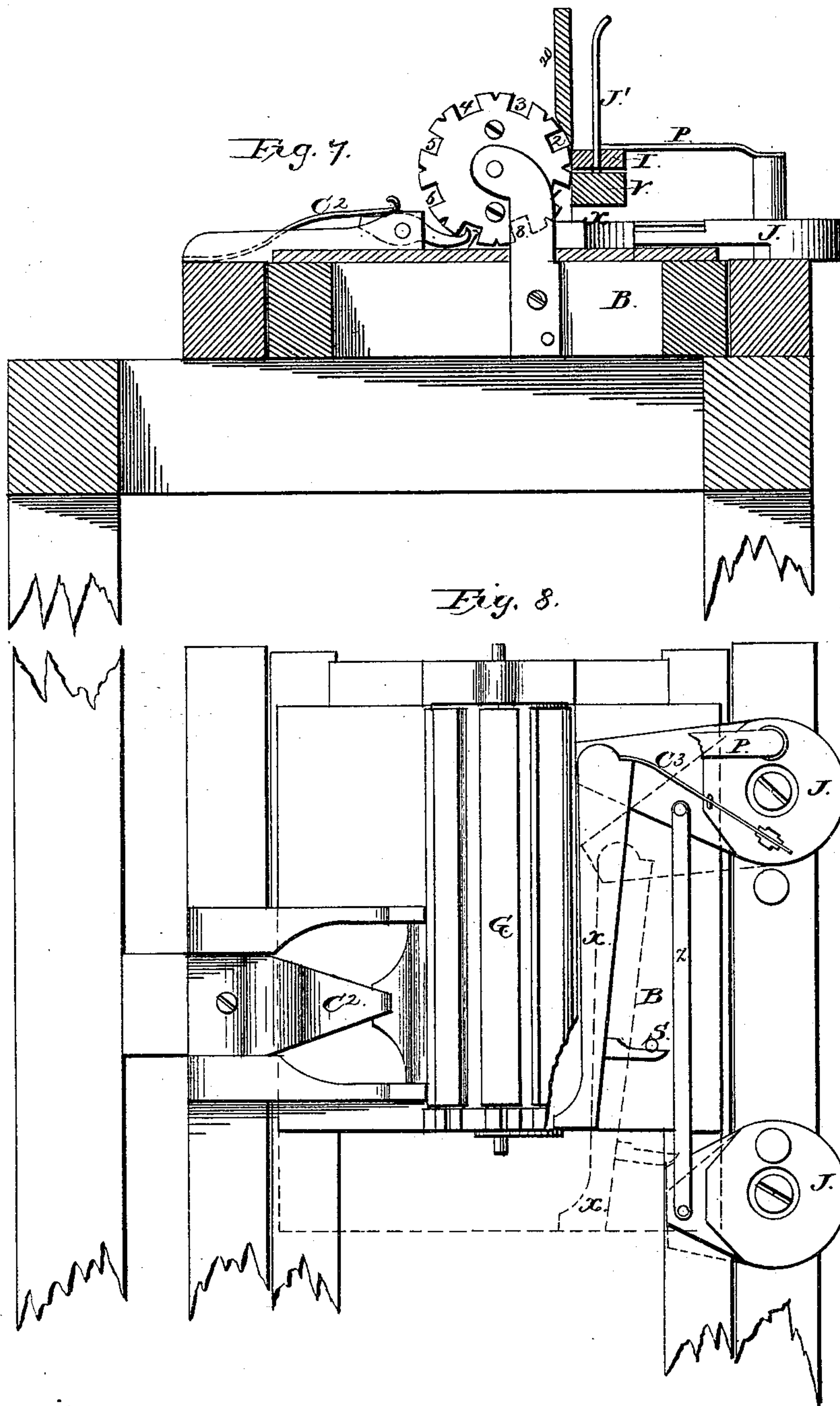
BY

mmu
ATTORNEYS.

S. BISBEE.
RAKE TOOTH-LATHE.

No. 178,587.

Patented June 13, 1876.



Witnesses:
C. Wolff
J. Goethals.

Inventor:
S. Bisbee.
By- *Munn & Co.*
Attorneys:

UNITED STATES PATENT OFFICE.

SYLVESTER BISBEE, OF SUMNER, MAINE.

IMPROVEMENT IN RAKE-TOOTH LATHES.

Specification forming part of Letters Patent No. 178,587, dated June 13, 1876; application filed January 7, 1876.

To all whom it may concern:

Be it known that I, SYLVESTER BISBEE, of Sumner, in the county of Oxford and State of Maine, have invented an Improvement in Rake-Tooth Lathes, of which the following is a specification:

The invention will first be described in connection with the drawings, and then pointed out in the claims.

Figure 1 is a plan view. Fig. 2 is a longitudinal section. Fig. 3 is a transverse section. Fig. 4 is a detail in longitudinal section, showing the devices employed. Fig. 5 is a section and side elevation of the transferring-tube. Fig. 6 is a plan of the ejector. Fig. 7 is a cross-sectional elevation; and Fig. 8, a plan view, partly broken away.

Similar letters of reference indicate corresponding parts.

Sliding on the main frame A, in suitable guides, is a reciprocating carriage, B, which receives its motion, through the connecting-rod *d*, direct from the disk *c*, turned by the gear and worm E F. Mounted on one end of the carriage B is a long cylinder, G, at the other end a short cylinder, H, each of which contains eight grooves. These cylinders receive, in addition to the reciprocating motion, a rotary turn of one-eighth of a revolution at each reciprocating motion, one being turned while the rod *d* is passing over one of its dead-center, and the other while said rod is passing its other center, so as to present the empty grooves to the feeding devices, and those containing the rods and blanks to the devices for forming the teeth in proper order, said feeding and forming devices consisting, essentially, of the feed-plate I, setting-knife 2, cutter-head 3, set-back 4, saw 5, ejector 6, projection 7, and feed-hook 8, together with the devices for turning the tenon, as hereinafter described.

The cylinder G occupying the position shown, the feed-plate I pushes a rod into groove 1 of cylinder G, where it is held by springs J². The cylinder, on the next turn, places the rod under knife 2, and, by preventing its return,

allows a blank at the next turn of cylinder to be cut off by cutter-head 3, being held by spring *f* and stationary knife *f*². The feed-knife 2 consists, essentially, of a spring-plate, *a*⁵, fastened obliquely on the end of a handle or stock, *f*¹, which is pivoted to the side of board 20, and has a spring, *c*⁶, which is fixed under pin 14, so as to press the end of plate *a*⁵ on the rods in such manner that it acts as a spring-pawl to shove out the rods. On the next forward movement the rod is carried into the cutter-head and turned. On its next forward motion it is released by the shape of the knife *x*¹, and strikes against the set-back, the object of which is to correct any difference in the length of the blanks.

On the next forward movement, the rod now being clamped by the sharp projection *c*¹ of the knife *x*¹, as shown, the rod enters the cone 5' of tube *d*¹, where it is cut off by the swinging saw 5. This saw swings freely back and forth on the pivots *m m*, being driven from a belt on its pulley *n*, and moves up to the rod by a cam on the disk *c* acting on a projection, 3', of the frame N, and thrown back by a spring, T.

To enable the saw to sever the rod easily it requires to receive a slight reciprocating motion to enable it to follow the motion of the rod while the crank is passing nearly on the dead-center. This is effected by the cross-bar V of the carriage striking on the projecting pivot *m*, carrying it forward, the return motion being produced by the spring *o*. On the next turn of the cylinder the rod is carried into contact with the ejector 6. This is formed as shown in Fig. 6, and hung on pivots *g g*, and held up into the grooves by a spring, *c*².

Its operation is as follows: On the forward movement of the cylinder the projection H' of the ejector slips up directly behind the piece of a rod, in case the piece is not long enough to make a blank, when, on the backward movement, the piece is thrown out, the length of the pieces thrown out being governed by the length of the projection H'. On the next turn and forward movement of the cylinder

the rod comes in contact with the projection 7 on the brace VI, setting the rod back flush with the cylinder.

On the next turn and forward movement of the cylinder the rod, if there is one in the groove, is carried into contact with the feed-hook 8, by which the rod, or the absence of a rod, governs the feeding device, as follows: The hook 8 is provided at its forward end with two projections, one of which catches on the pin S, attached to the carriage, carrying the hook forward, and, through the following devices, feeding a rod into the cylinder. The backward motion of the hook is governed by the rod itself. If there is no rod in the groove the hook enters the groove behind the standard of the cylinder G, when, on the backward motion of the cylinder, the hook is carried with it, working the feed device, as above described. If, however, the groove is filled with a rod, the hook is thrown out of contact with the standard, and, therefore, is not carried back, but remains in the position shown in the dotted lines, and the feed devices remain stationary until an empty groove comes round there, for the feed is entirely automatic.

The devices for operating the feed-plate I through the medium of the hook consist of two disks, J J, of which one has an arm jointed to the hook, and thereby receives its motion. The other receives its motion from the first through the connecting-rod Z, and they, in turn, communicate to the feed-plate I through the rods P P. The spring for holding the hook up to the grooves is shown at C³.

The feed-knife 2 is composed of a pivoted handle, f¹, inclined blade a⁵, spring c⁶, and pin 14, for the purpose of preventing the blade from coming in contact with the cylinder on its backward movement.

The rack for holding the rods one above the other consists of a bed-plate, U, from which rise bent wires J¹, and of a plate, 20, to which is attached the feed-knife, the whole being supported by the brackets c⁴ c⁴, and strengthened by the brace VI, which is attached to the frame of the machine. This brace is constructed with a projecting finger, c⁵, for preventing the rods from being thrown up by the feed-knife out of the grooves; also, with a cone-shaped recess at the end of the tube d', for the purpose of guiding the rods into the tube; also, with a projection, 7, all in one casting.

The operation of the cylinder H with the tube d' is as follows: The tube is of such a length that, when filled with blanks, one projects at the end exactly opposite a groove in the cylinder H, so that on the cylinder moving up, the blank enters the groove, being guided in by a spring, 10, on the tube.

The friction-strap A', tightened by the spring B' on the standard P¹, holds the blanks

in the grooves of the cylinder, so that on its backward movement it withdraws the blank from the tube and retains it on the cylinder while being carried over by the rotary movement. At c⁶ is shown a set-back, against which the blank strikes on its next forward movement, for the purpose of regulating the length of the tenon. Having been set as above described, the blank, on its next forward movement, is carried into the cutter-head 3^a to be finished.

The device for clamping the blank while being carried up to the cutter is shown above the cylinder H, and consists of a clamp, g¹, and spring g². The clamp serves to secure the blank through the downward pressure on the spring, produced by the cam S², while, to release the blank, the return movement of the cam lifts the clamp by arm g⁴. This cam turns in bearings on the standards P¹ P¹, and receives its motion through the crank P² and stationary slotted stud T².

After the tenon is turned the tooth is carried over and dropped by the rotation of the cylinder.

The turning of the cylinders in the manner described is effected through the cam IV on the disk c, and transmitted to the cylinders by the arms V² and V³, provided with the dogs x² x³ and springs x⁴, for holding them up to the ratchets. The arm V² is pivoted to the bridge V⁶, which is bolted to the carriage B and clamp-holder A^x, as shown. This arm receives its return motion on the carriage, moving forward by the projection 16 on the frame, and the arm V³ receives its return movement by its curved end striking on the inclined box K.

In case the machine is to be employed for turning spool-blanks or pins, all that is required is to remove the cylinder H, and the holding and clamping devices connected therewith, when the machine can be employed for the above purposes with great advantage.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a lathe, the reciprocating carriage provided with cylinders rotating in opposite directions, as and for the purpose described.

2. The longitudinally-grooved cylinder G, combined with feed-plate I, setting-knife 2, cutter-head 3, set-back 4, saw 5, ejector 6, projection 7, and feed-hook 8, as and for the purpose set forth.

3. A feed-rack for lathes, consisting of bed-plate V, bent rods J¹, cross-plate 20, having feed-knife, brackets c⁴, and brace having fingers c⁵, as and for the purpose described.

4. The combination, with feed-plate I and hook 8, of the disks J, connecting-rod Z, rods P P, and spring C³, as and for the purpose set forth.

5. The feed-knife 2, composed of a pivoted handle, f^1 , inclined blade a^5 , spring c^6 , pin 14, combined and arranged as described.

6. The clamping-knife x' and spring f^1 , combined and arranged with the cylinder in the manner shown.

7. The set-back c^6 , combined with tube d' and cylinder H, for the purposes described.

8. The slotted friction-strap A' , spring B' , and the griper g^1 , in combination, all for the purposes described.

9. The combination, with cam S^2 , of the grippers g^1 , spring g^2 , and arm g^4 , as and for the purpose set forth.

10. The combination, with cam S^2 , of the crank P^1 and stationary slot-stud T^2 , as above shown.

SYLVESTER BISBEE.

Witnesses:

SARAH H. BARRETT,
ELIAS MARSH,
GILBERT BARRETT.