

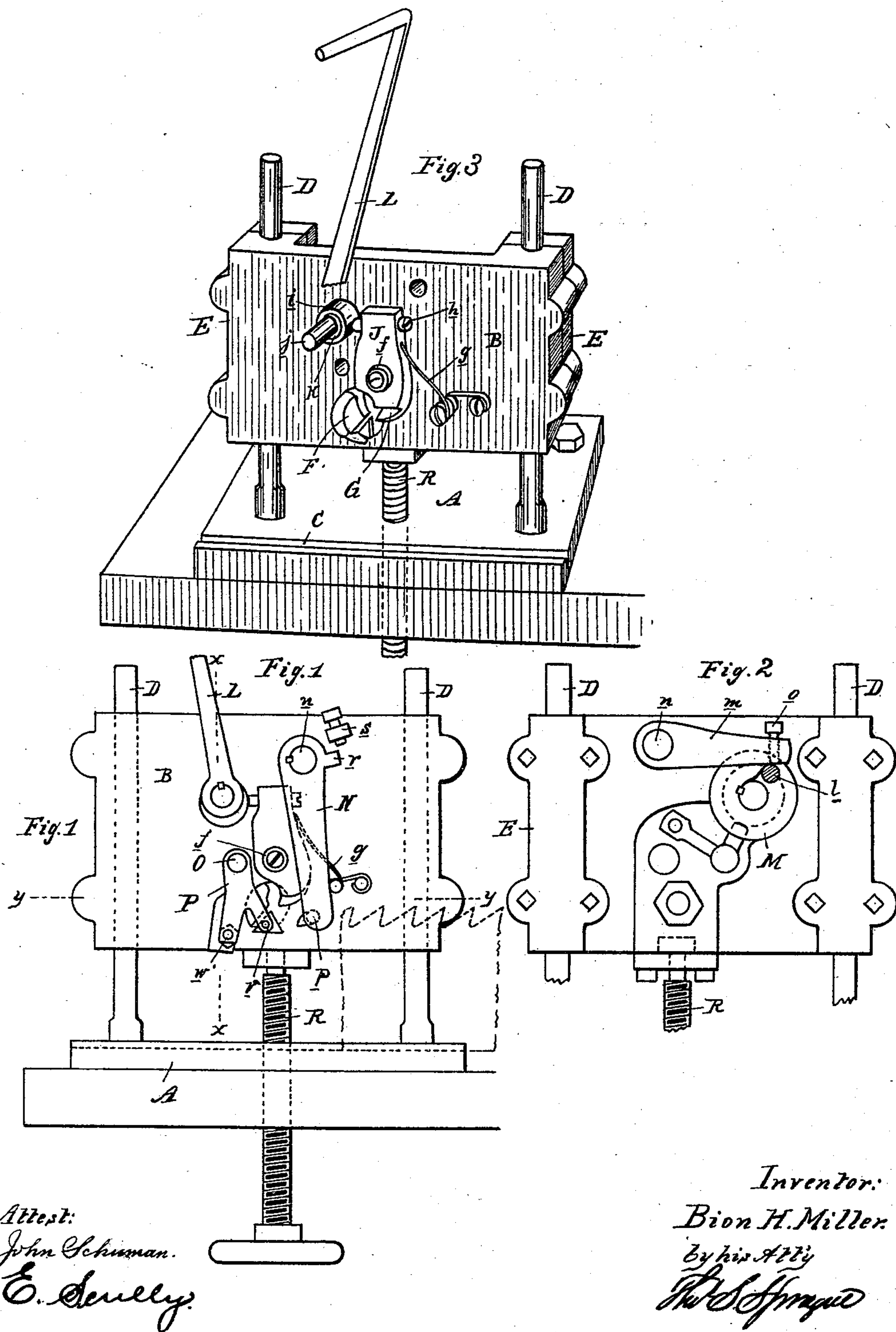
(No Model.)

2. Sheets—Sheet 1.

B. H. MILLER.
SAW SWAGING MACHINE.

No. 370,367.

Patented Sept. 20, 1887.



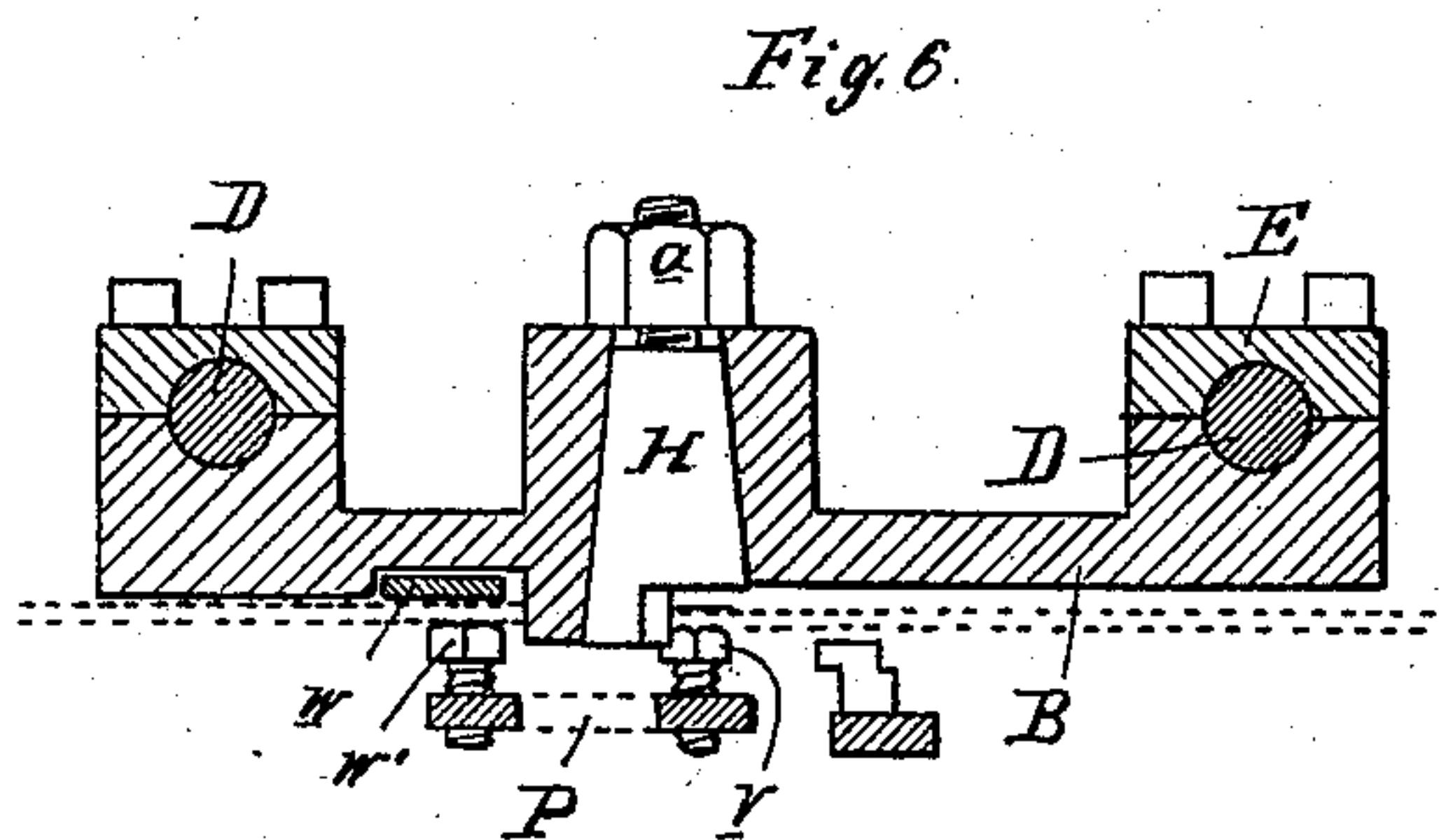
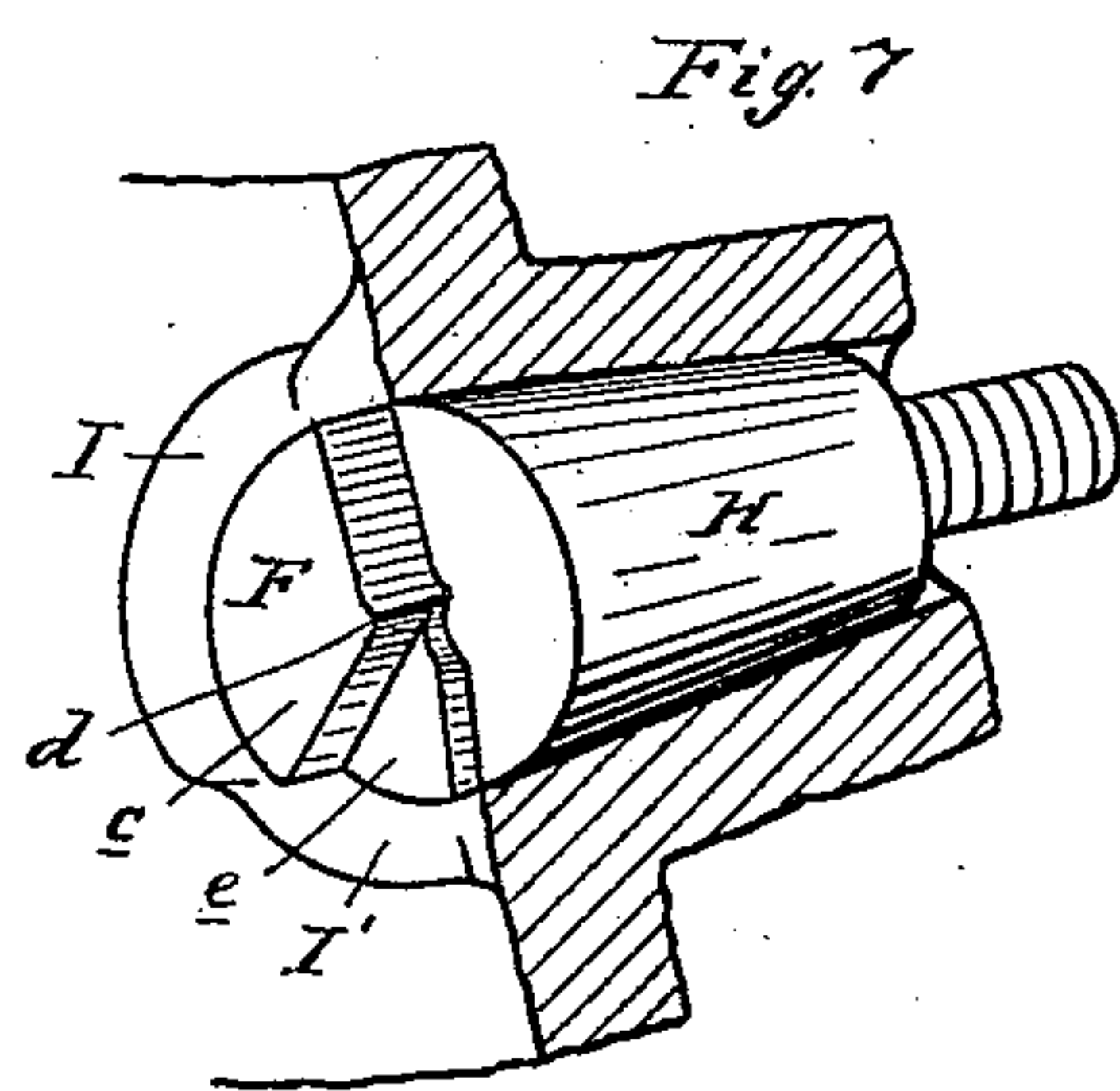
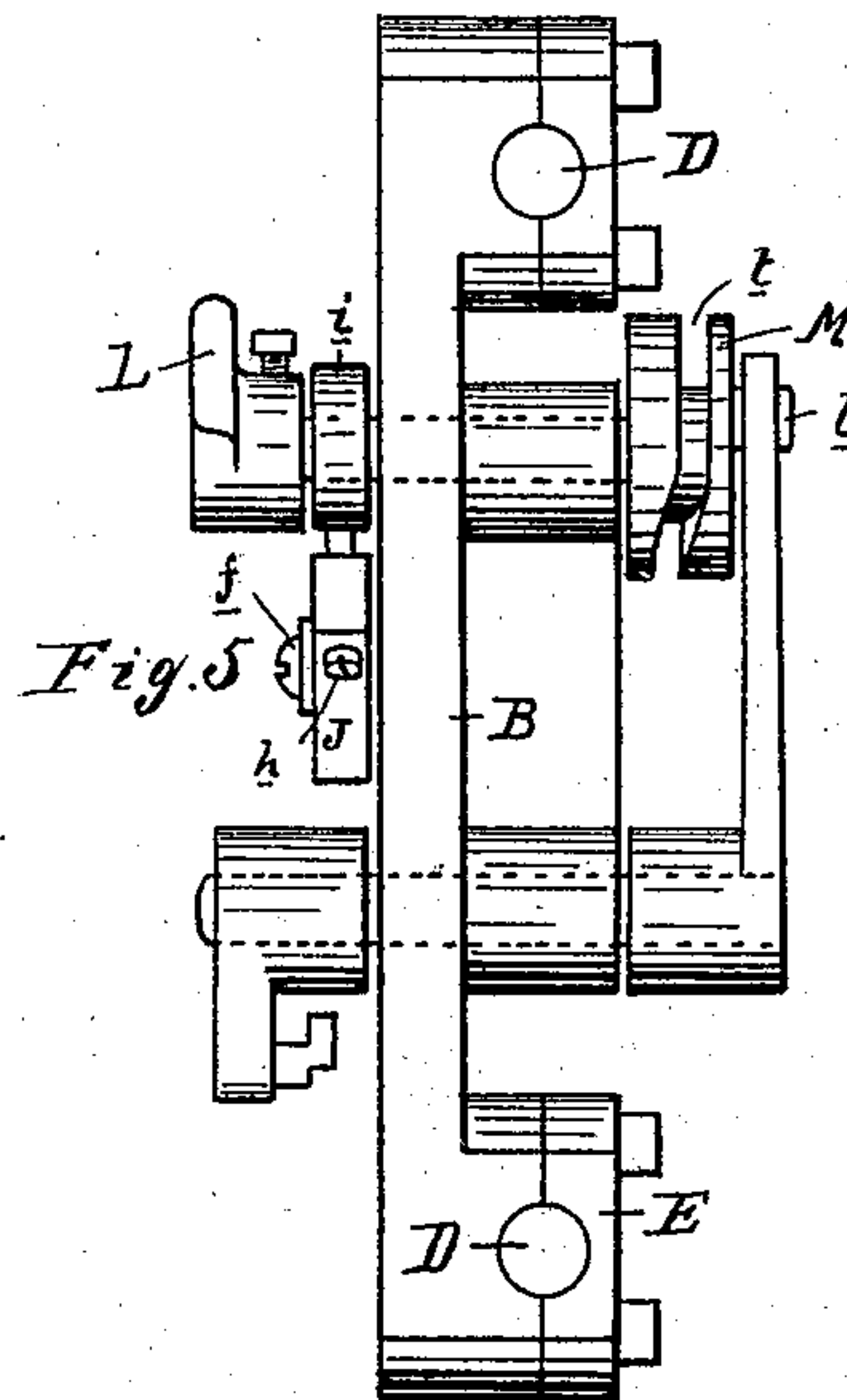
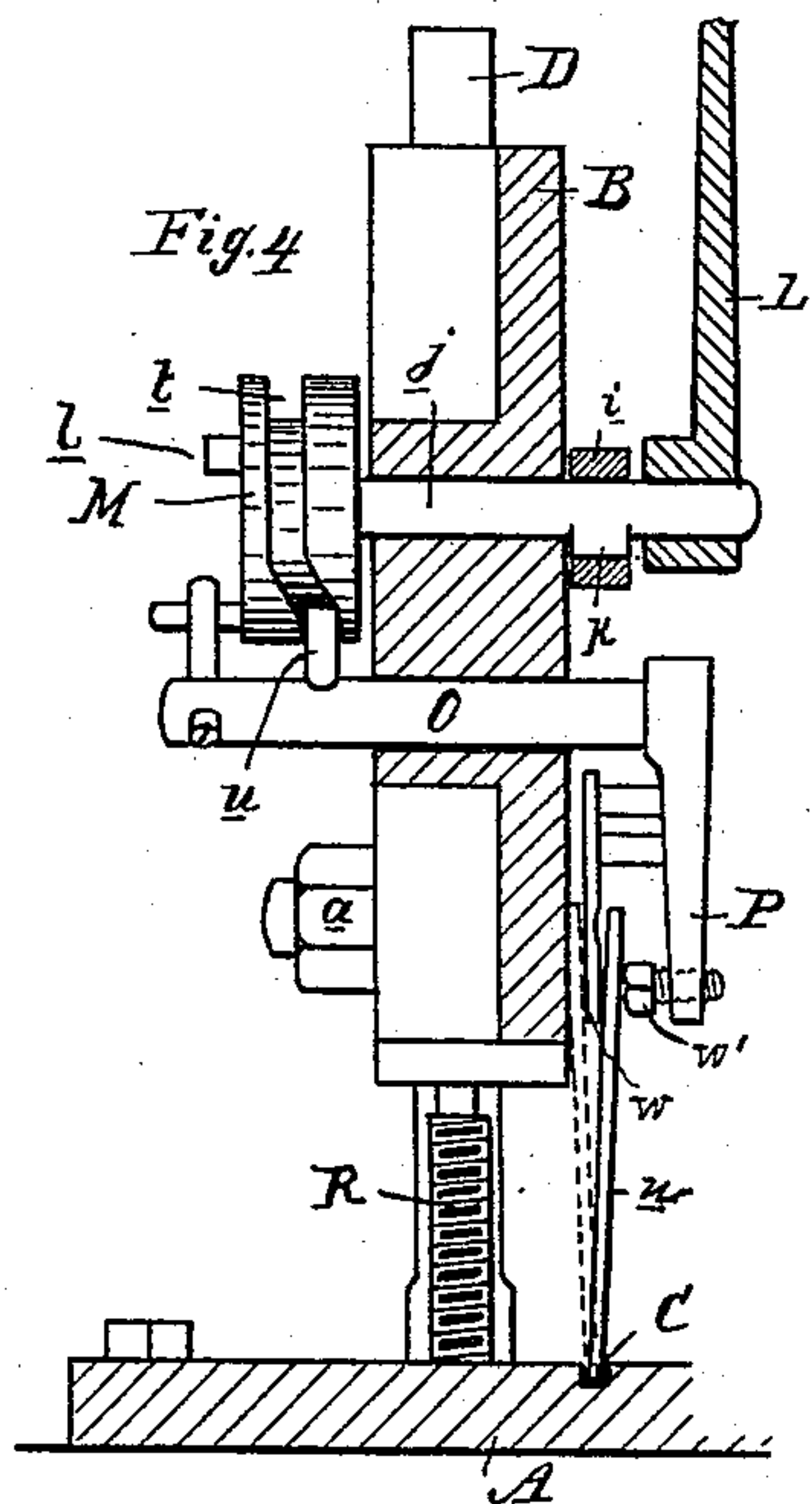
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

BION H. MILLER, OF BAY CITY, MICHIGAN.

SAW-SWAGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,367, dated September 20, 1887.

Application filed February 3, 1887. Serial No. 226,355. (No model.)

To all whom it may concern:

Be it known that I, BION H. MILLER, of Bay City, in the county of Bay and State of Michigan, have invented new and useful Improvements in Saw-Swaging Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to new and useful improvements in the construction of saw-swaging machines of that class intended for automatic operation; and the improvement consists in the novel construction, arrangement, and combination of the different parts as hereinafter described, and specifically set forth in the claims.

15 In the drawings which accompany this specification, Figure 1 is a front elevation of my improved machine. Fig. 2 is a rear elevation thereof. Fig. 3 is a perspective view of the two-part adjustable frame, with some of the operating parts omitted to show more clearly the swaging-dies. Fig. 4 is an end view. 25 Fig. 5 is a plan. Fig. 6 is a horizontal cross-section on line *yy* in Fig. 1. Fig. 7 is an enlarged detail perspective of the bed-die or anvil.

30 A frame consisting of the horizontal bed-plate A and of the vertical plate B supports the operating parts. The horizontal bed-plate A is secured upon a work-bench and forms a stationary rest for the saw. It is also provided with a suitable saw-guide, preferably in the form of a channel, C, in the bed-plate, of 35 suitable width to admit different thicknesses of saw-blades. The vertical plate B is adjustably carried by the horizontal bed-plate A by means of vertical standards D, engaging into the two-part clamping-boxes E, formed upon 40 the sides of the plate B. This vertical plate carries the dies, which consist of the bed-die or anvil F and the movable swaging-die G.

45 The bed-die F is formed on the projecting end of a conical steel pin, H, which rests in a corresponding seat of the plate B and is secured therein, adjustably, by means of a nut, *a*. The die itself forms a segmental portion of the free end of the pin, the face *c* constituting the abutment against which the tooth 50 rests, and the corner *d* the anvil on which the

cutting-edge of the tooth is formed by the swaging-die. As this corner *d* forms the center of the pin H, it is clear that the die F may be adjusted to suit any angle of saw-tooth 55 without disturbing its relative adjustment to the swaging-die. The die F projects from the face of the plate B; but a segmental annular flange, I, is formed on the latter to support the die F on the back. The pin H is further 60 provided with a segmental portion, *e*, of sufficient extent to form a side bearing for the saw-tooth under operation. This portion also projects from the face of the plate B and is supported by a flange, I', formed on said plate. 65

The movable die G is formed on the free end of a lever, J, fulcrumed upon a pivot-pin, *f*, and provided with a retracting-spring, *g*, and with an adjustable bearing-pin, *h*, which bears against the face of the eccentric K, 70 thereby operating the movable die. The eccentric K is provided with a loose collar, *i*.

The shaft *j* is journaled transversely in the plate B, and is provided upon its rear end with a feed-wheel, M, which is provided with 75 a cam or crank pin, *l*, by means of which the feed-lever is operated. This feed-lever consists of a rock-arm, *m*, secured to a shaft, *n*, and provided at its free end with an adjustable bearing-pin, *o*. The shaft *n* is journaled 80 transversely in the plate B, and to the front end thereof is secured the oscillating feed-lever N, the lower end of which is provided with a fixed pin or finger, *p*, arranged to engage with the teeth of the saw for the purpose of feeding it 85 in the manner hereinafter described. This feed-lever N is provided with the toe *r*, which operates in connection with an adjustable stop, *s*, to regulate the oscillation of the feed-lever to the desired degree to feed the saw tooth by 90 tooth, as hereinafter more fully explained. The feed-wheel M is provided with an annular cam-groove, *t*, into which engages a pin, *u*, upon a sliding shaft, O. This shaft is journaled in the plate B, and is provided upon its front 95 end with an arm, P. This arm P carries upon its lower end an outside side bearing, *v*, which acts in connection with the fixed side bearing *e* on the bed-die to clamp the saw-tooth under operation. The arm P is furthermore provided with another set of side bearings, *w w'*, 100 between which the saw passes after leaving

the dies. The inside side bearing, *w*, is rigidly secured to the arm *P*, and the outside side bearing, *w'*, is adjustably secured thereto.

The plate *B* is centrally and adjustably supported by means of a hand-screw, *R*, which is swiveled into the lower end of the plate *B* and screw-threaded through the bed-plate *A*.

In practice the back of the saw is placed in the channel *C* of the plate *A*, and by means of the hand-screw *R* the dies are brought into proper relative position with the saw-teeth. Movement being given to the shaft *j*, the crank-pin *l* on the wheel *M*, at each revolution of the wheel, produces, through the medium of the arm *m* and shaft *n*, the forward movement of the feed-lever, which is once for all so adjusted as to bring the saw-teeth into proper relative position with the dies. The retraction of the feed-lever is brought about by the action of gravity caused by the weight of the rock-arm *m*, (or if not obtained in this manner by a suitable spring,) and by adjusting the stop *s* the required degree of retraction necessary to bring the feed-finger into engagement with the next tooth is obtained. Thus the feed can be easily regulated to suit the space of the saw-teeth. Before the feed-lever, however, executes its feeding movement the saw-blade is tilted automatically toward the front sufficiently far to clear the bed-die. This is caused by the sliding shaft *O*, which is actuated at the proper time by the cam-groove *t*, and causes the bearings *w w'*, between which the saw-blade passes, to carry the upper portion of the saw away from the bed-die and keep it there until the feeding movement is completed, after which the retraction of the sliding shaft restores the saw again into its proper position for swaging. The forward tilting of the saw engages the feed-finger between the saw-teeth, and the backward tilting disengages it therefrom, so as to render the feed-lever free to retract.

What I claim as my invention is—

1. In a saw-swaging machine, a frame consisting of a stationary bed-plate, which forms the saw-rest, and a vertically-adjustable plate, the swaging-dies carried by said adjustable plate, and feed devices on said vertical plate, substantially as described.

2. The combination, with the stationary horizontal bed-plate constructed to form the saw-rest, of a vertical plate adjustably carried on vertical standards rising from the horizontal bed-plate, the dies and the feed device carried by said vertical plate, and a hand-screw for adjusting said plate, dies, and feed device, substantially as described.

3. In a saw-swaging machine, a stationary bed forming the saw-rest, a vertically-adjustable plate carrying the dies, a stationary bed-die, a movable swaging-die, a feeding device, and a saw-tilting device, all carried by said plate, substantially as described.

4. In a saw-swaging machine, the combination of a stationary bed formed with a channel forming the saw-rest, a vertical plate adjustably supported on vertical standards of the stationary bed, a bed-die projecting from the face of the vertical plate and provided with a side bearing for the saw-tooth, a movable die fulcrumed to the vertical plate, an oscillating feed-lever having a rigid feed-finger, a movable outside bearing for the saw-tooth, and a combined movable outside and inside bearing for the saw-blade, arranged to tilt the saw on its bed, all carried by said vertical plate, substantially as described.

5. The combination, with the plate *B*, of the segmental bed-die or anvil *F*, provided with the conical pin *H*, adjustably seated in the said plate, and the nut *a*, substantially as described.

6. The combination, with the plate *B*, formed with flange *I*, of the segmental bed-die or anvil *F*, provided with conical pin *H*, adjustably seated in said plate, and formed with side bearing, *e*, and the nut *a* on the opposite end of said pin, substantially as described.

7. The combination of the crank-pin *l*, the feed-wheel *M*, the rock-arm *m*, the lever *N*, having feed-finger *p*, the toe *v*, and the adjustable stop *s*, all substantially as described.

8. The combination of the bed-plate *A*, having channel *C*, the vertical plate *B*, the feed-wheel *M*, having cam-groove *t*, the sliding shaft *O*, having finger *u*, and the arm *P*, having the bearings *w w'*, substantially as described.

9. The combination of the movable die *G*, the oscillating lever *J*, carrying said die, the plate *B*, shaft *j*, journaled therein, the eccentric or cam *K* on said shaft, and the rolling collar *i* on said cam, substantially as set forth.

10. The combination of the horizontal stationary bed-plate *A*, having the channel *C*, the vertical plate *B*, the bed-die *F*, provided with the inside bearing, *e*, the sliding shaft *O*, carrying the outside bearing, *v*, and the combined outside and inside bearings, *w w'*, substantially as and for the purposes described.

B. H. MILLER.

Witnesses:

H. S. SPRAGUE,
E. J. SCULLY.