

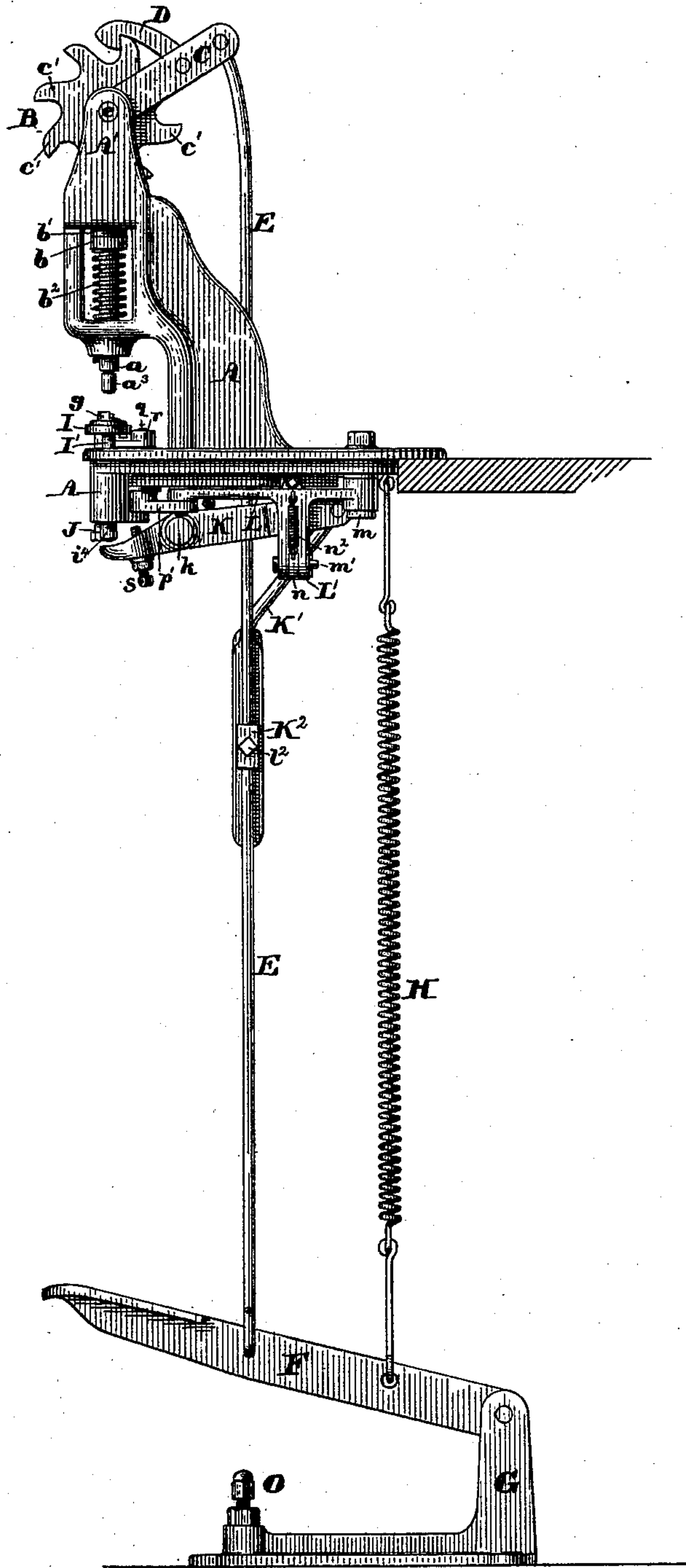
(No Model.)

3 Sheets—Sheet 1.

M. N. BRAY & E. M. POPE.
MACHINE FOR SETTING LACING STUDS.

No. 393,813.

Patented Dec. 4, 1888.



Witnesses:
Walter E. Lombard,
Henry L. Lewis.

Fig. 1.

Inventors:
Mellen N. Bray,
Everett M. Pope,
by *N. C. Lombard,*
Attorney.

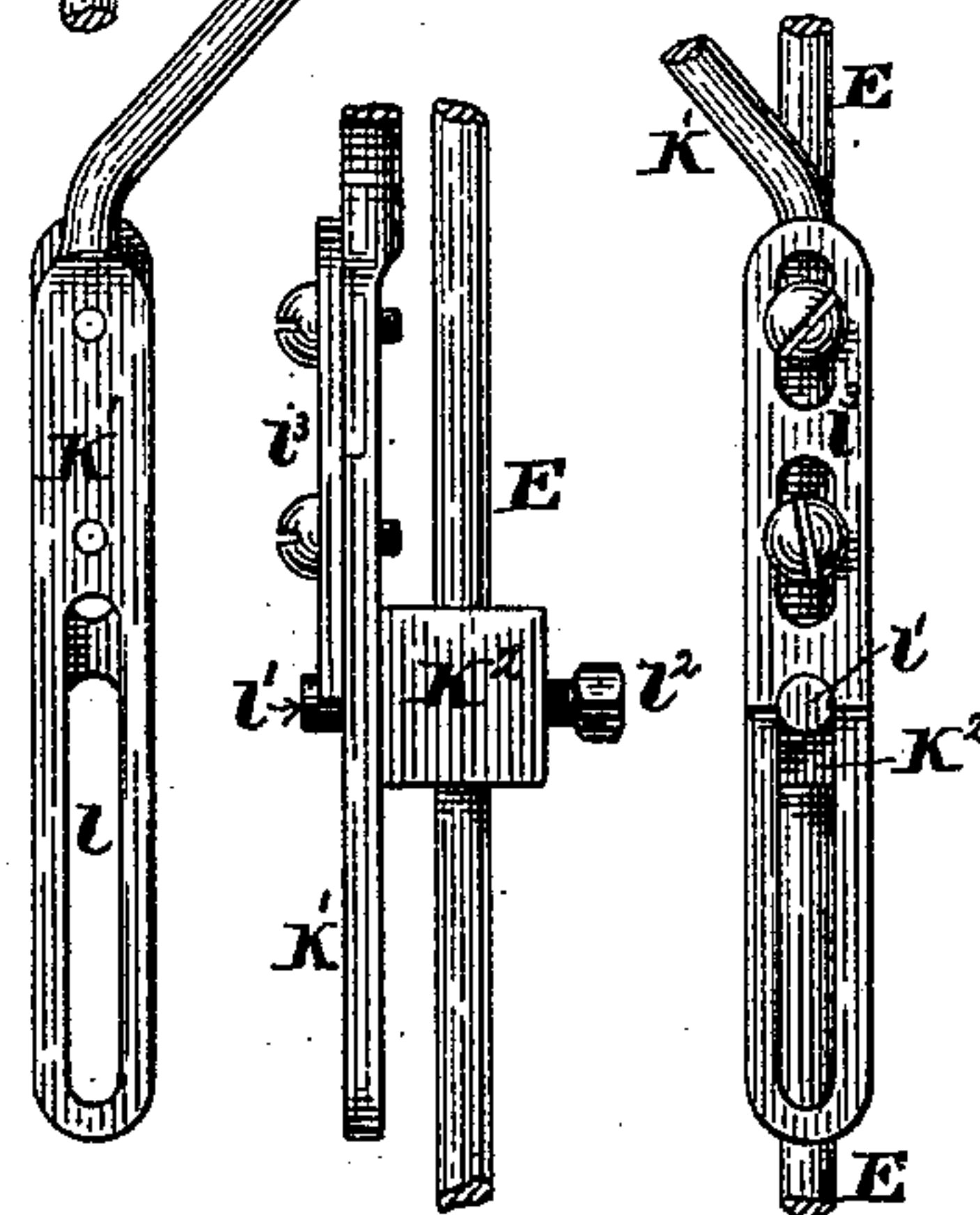
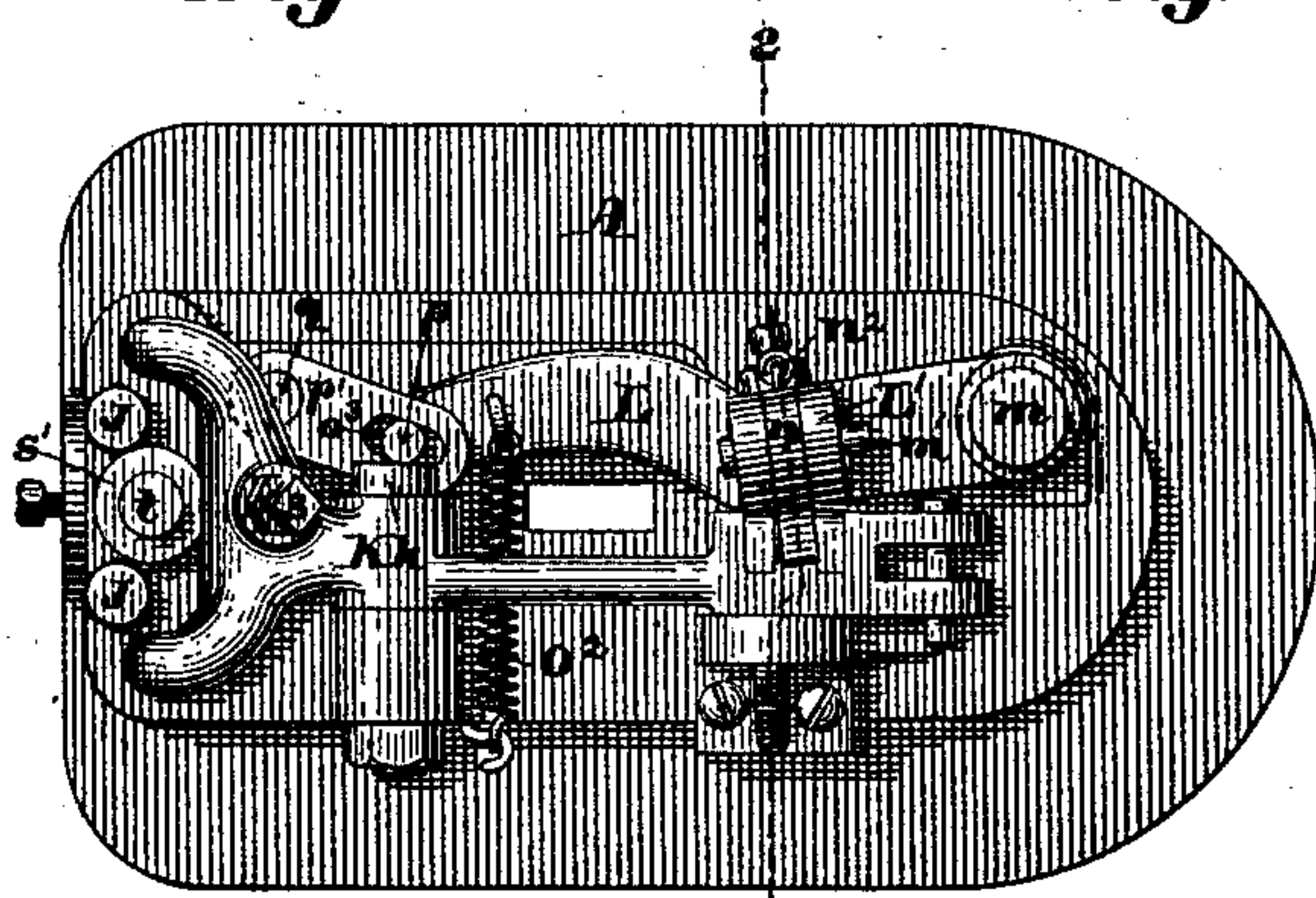
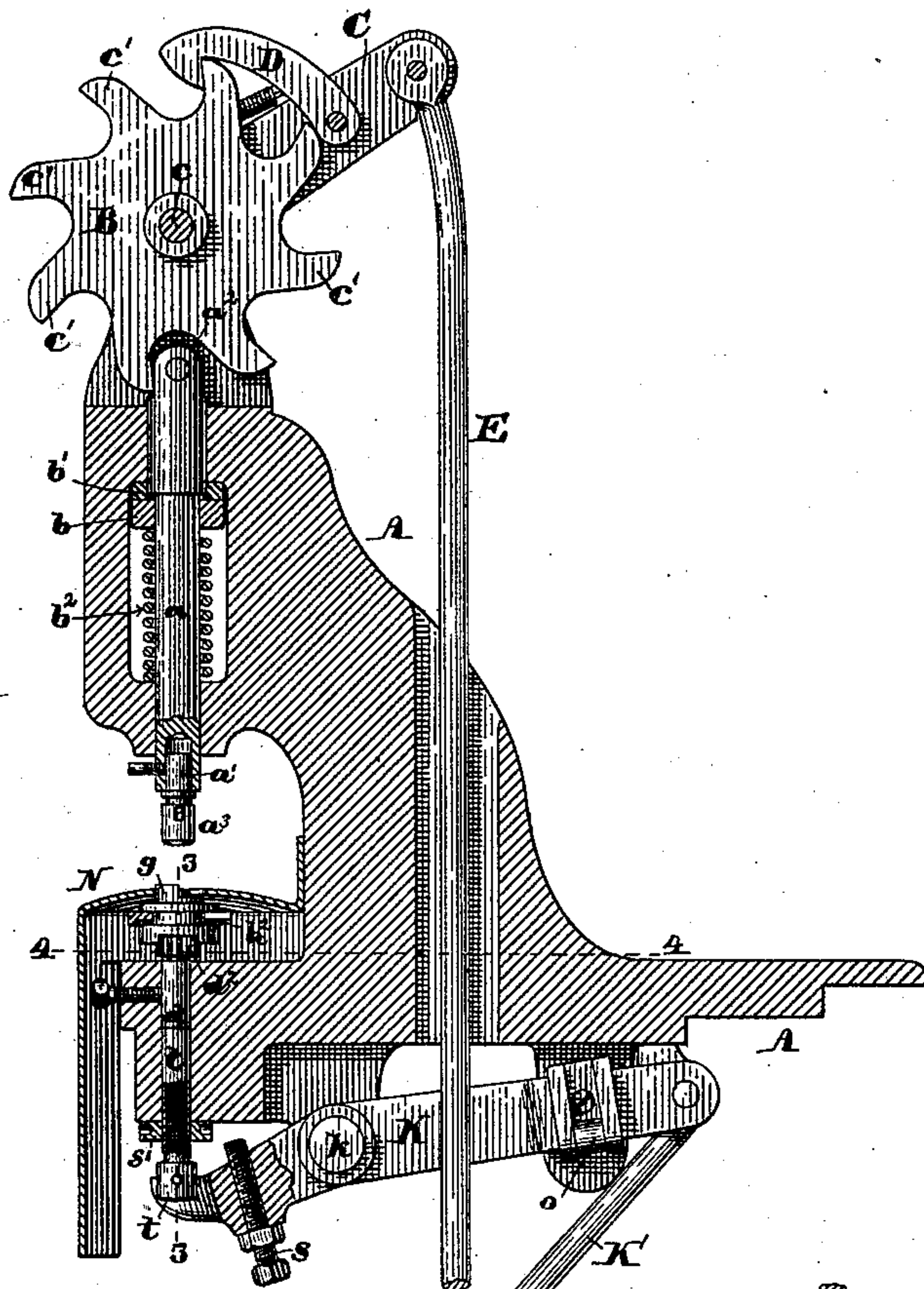
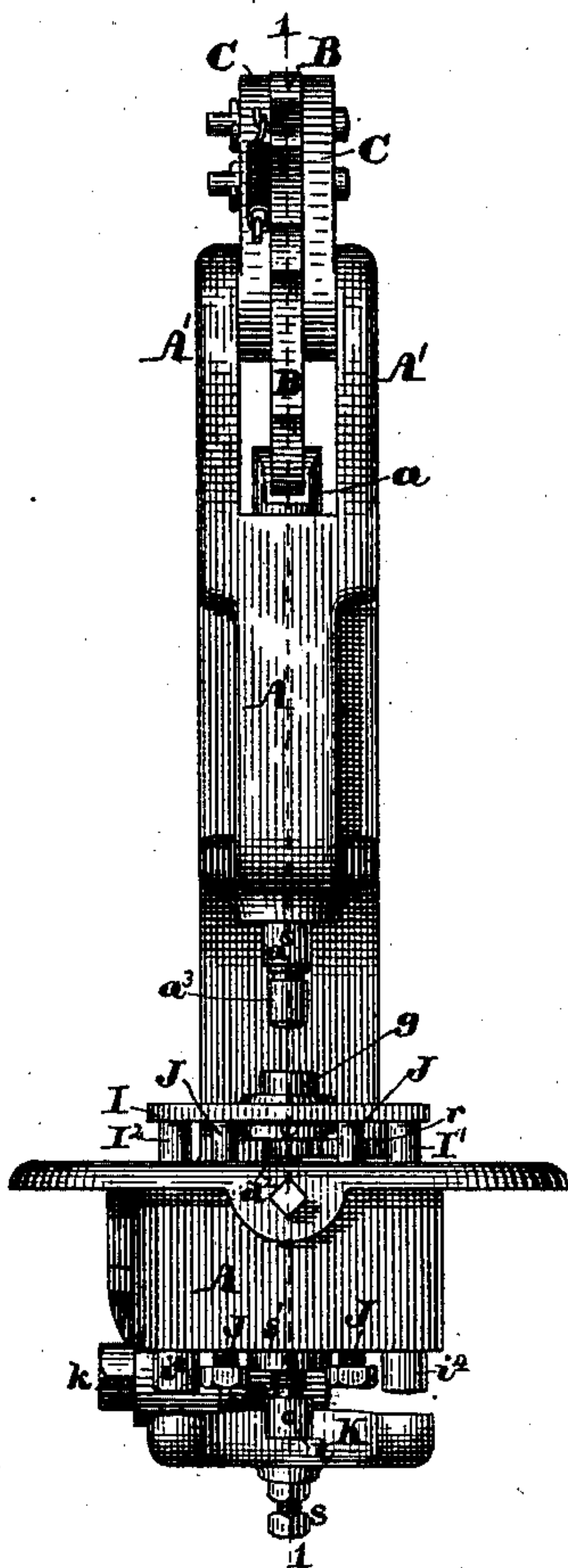
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(No Model.)

3 Sheets—Sheet 3.

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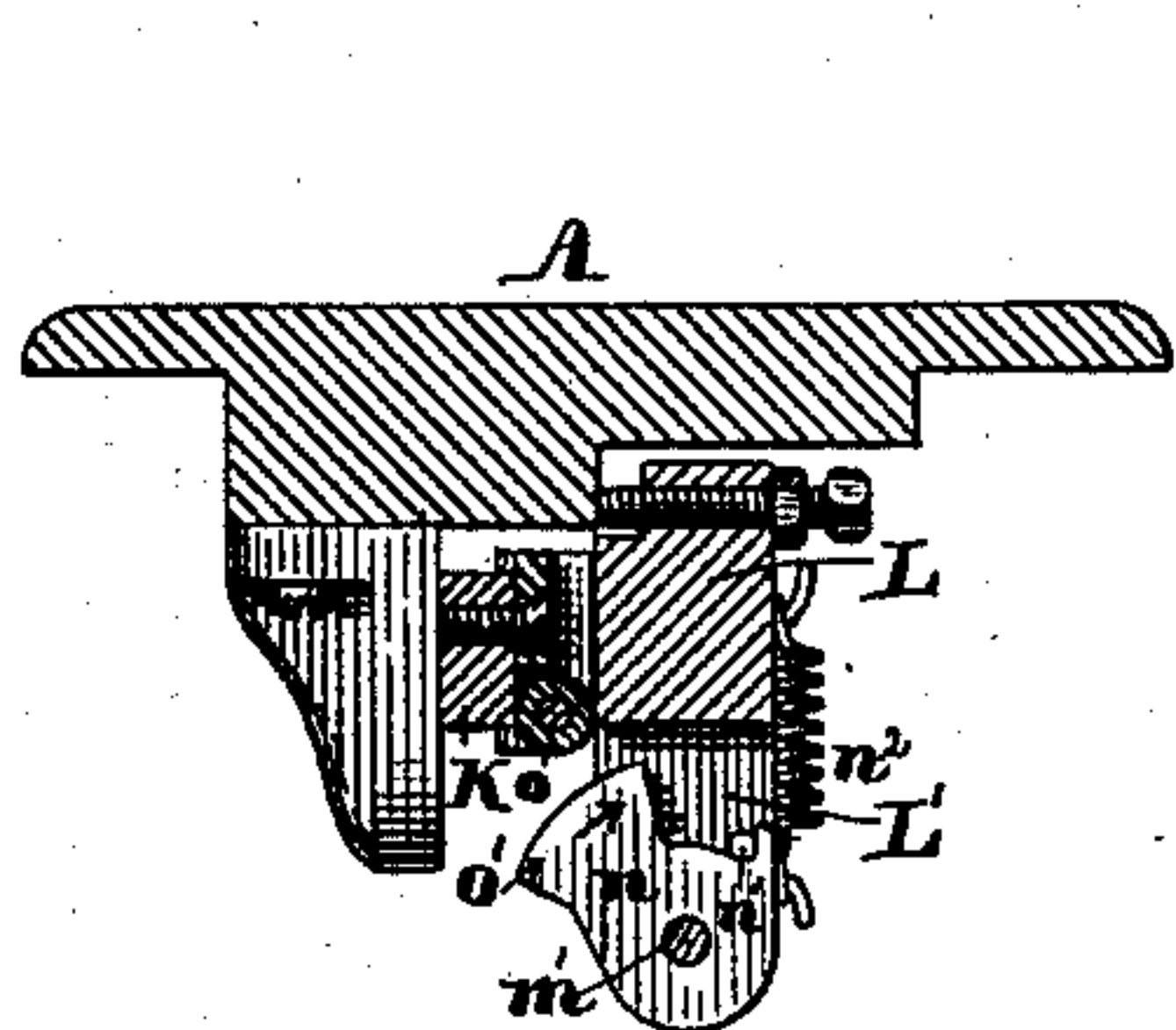


Fig. 7.

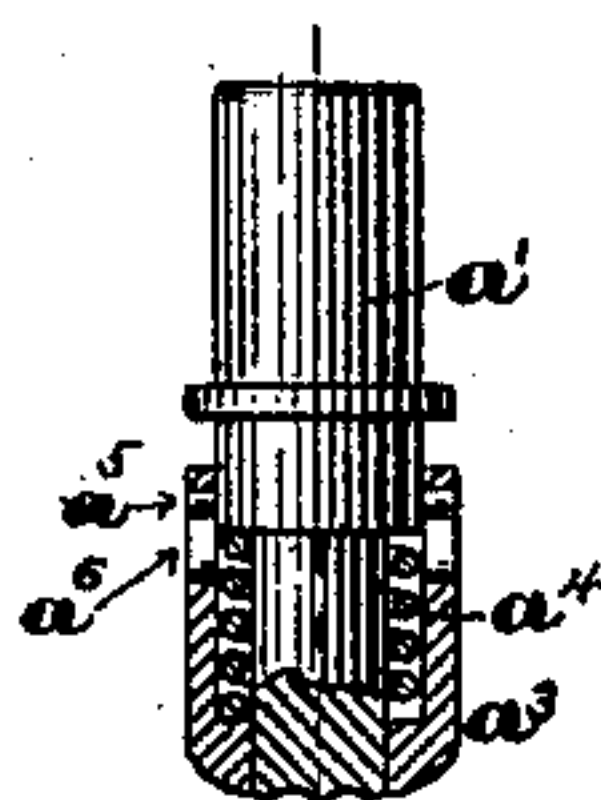


Fig. 16

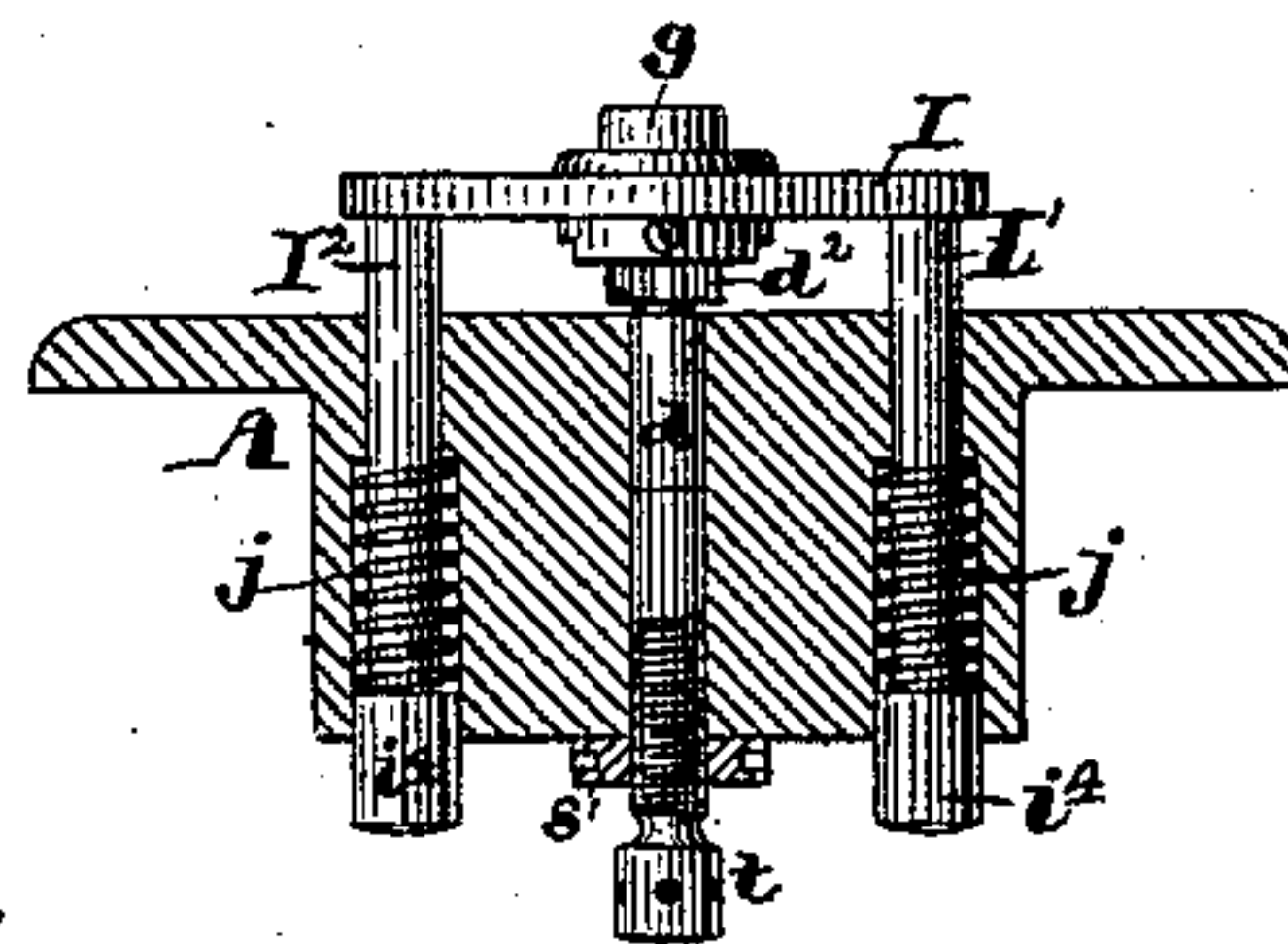


Fig. 8.



Fig. 17.

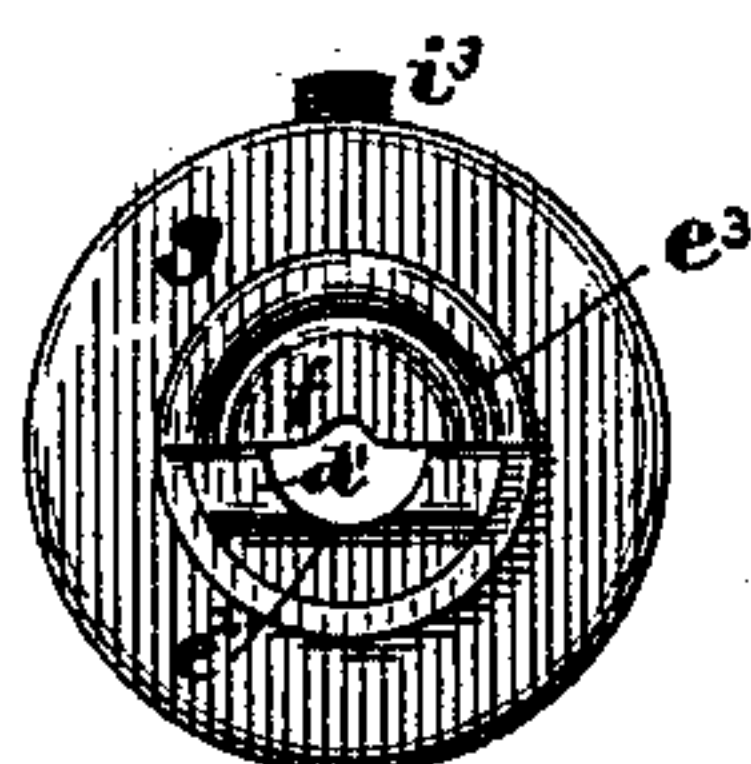


Fig. 10.

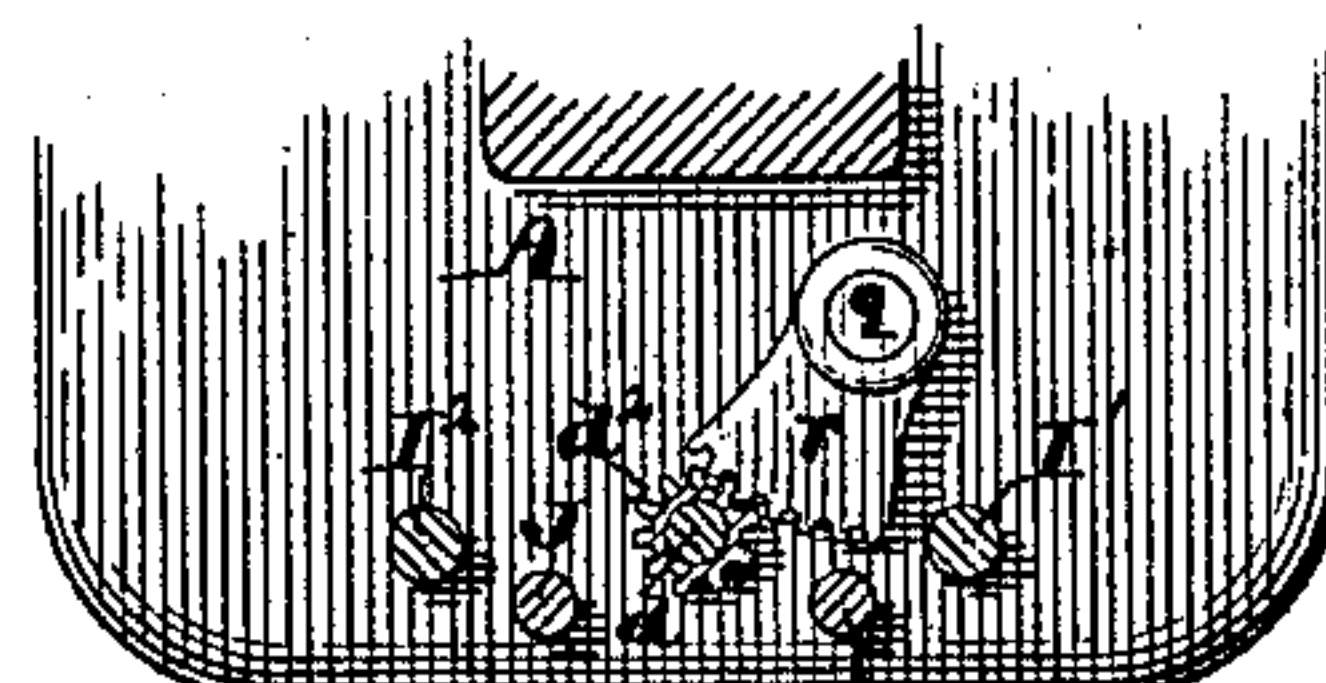


Fig. 9.

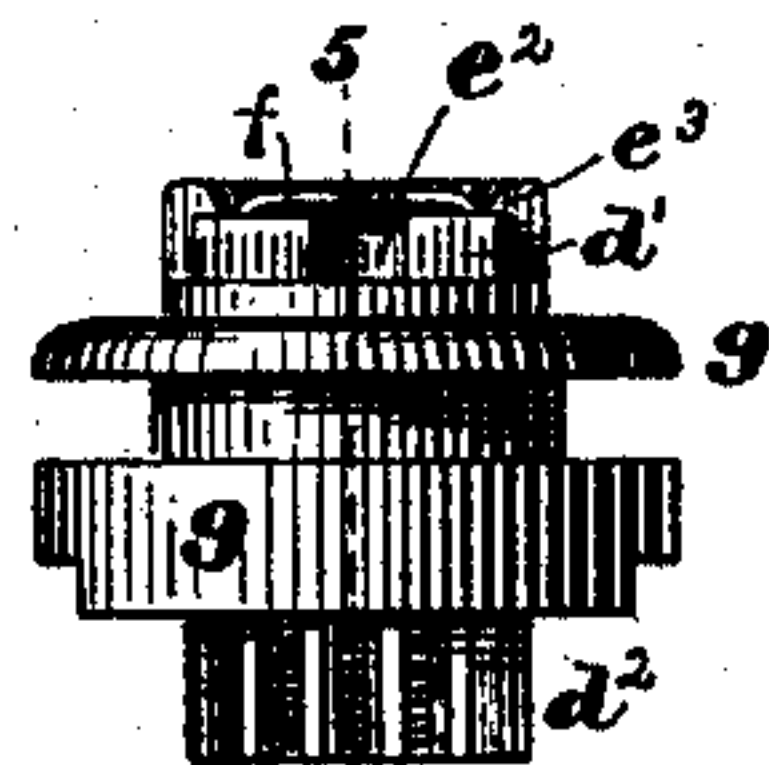


Fig. 11.

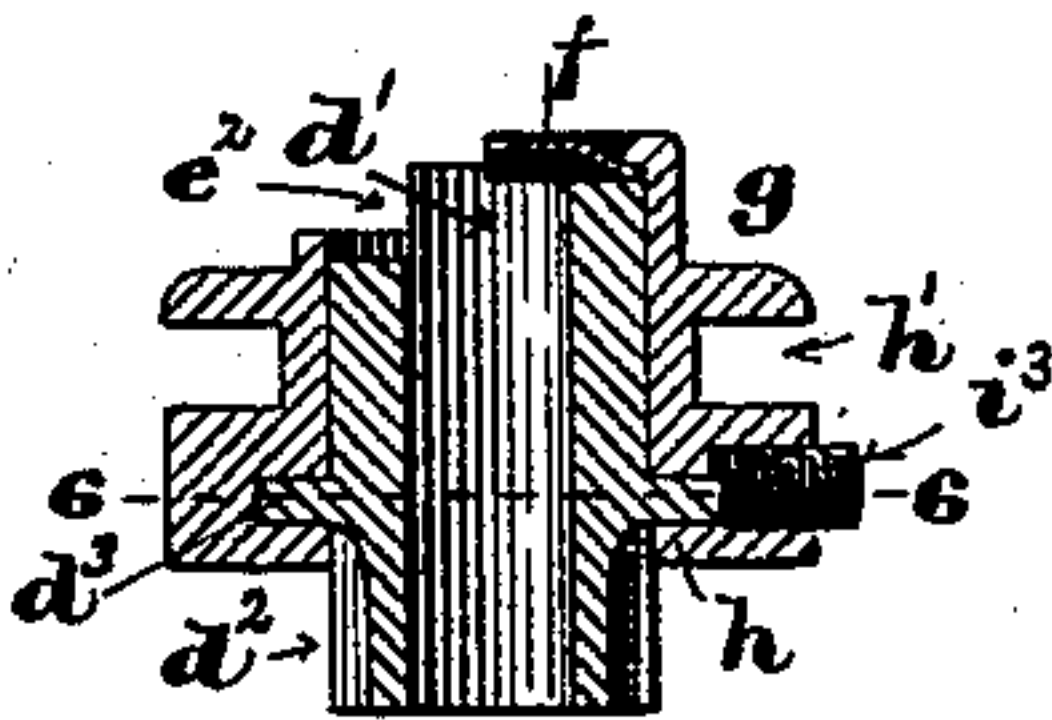


Fig. 12.



Fig. 18.

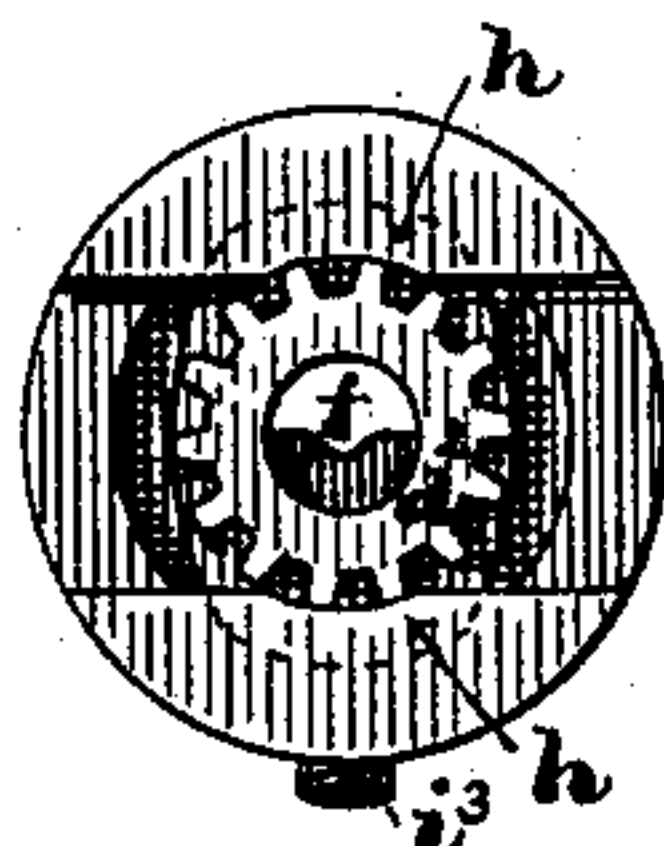


Fig. 13.

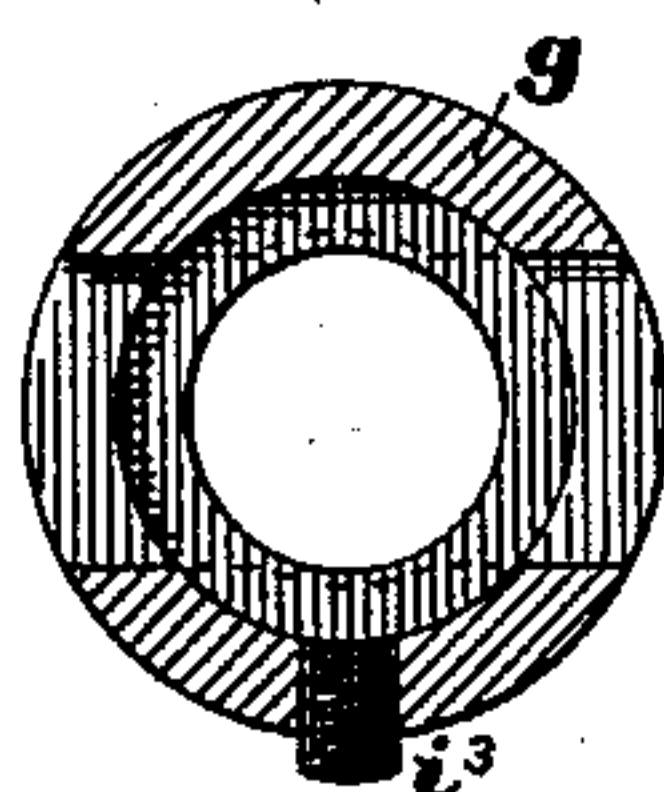


Fig. 14.



Fig. 19.

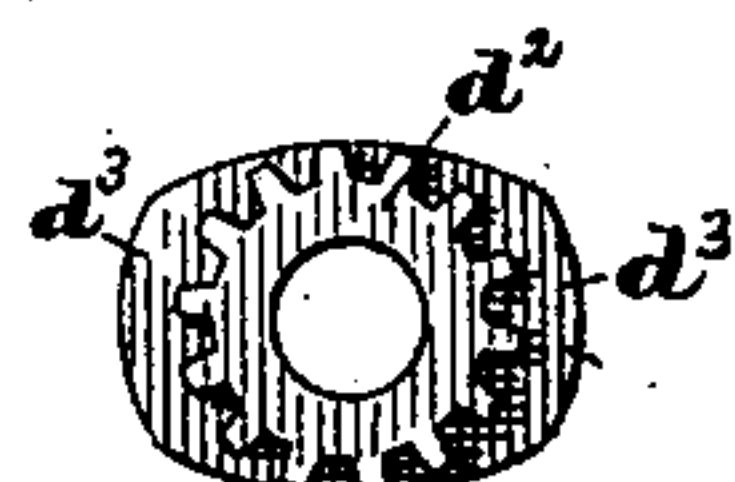


Fig. 15.



Fig. 20.



Fig. 21.

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UNITED STATES PATENT OFFICE.

MELLEN N. BRAY, OF BOSTON, AND EVERETT M. POPE, OF QUINCY, MASSACHUSETTS; SAID POPE ASSIGNOR TO SAID BRAY.

MACHINE FOR SETTING LACING-STUDS.

SPECIFICATION forming part of Letters Patent No. 393,813, dated December 4, 1888.

Application filed October 15, 1888. Serial No. 288,123. (No model.)

To all whom it may concern:

Be it known that we, MELLEN N. BRAY, of Boston, in the county of Suffolk and State of Massachusetts, and EVERETT M. POPE, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Setting Lacing-Studs, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to machines for setting lacing-studs in boots, gloves, or other articles; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be best understood by reference to the description of the drawings, and to the claims to be hereinafter given, and in which the invention is clearly pointed out.

Of the drawings, Figure 1 is a side elevation of a machine embodying our invention. Fig. 2 is a front elevation of the head of the machine. Fig. 3 is a vertical section on line 1 1 on Fig. 2, and showing the pendent slotted operating-link in elevation. Fig. 4 is an inverted plan of the head of the machine with the operating-rods removed. Figs. 5 and 6 are respectively a front elevation and a side elevation of portions of the coupled operating-rods. Fig. 7 is a vertical transverse section on line 2 2 on Fig. 4. Fig. 8 is a vertical section on line 3 3 on Fig. 3. Fig. 9 is a sectional plan of a portion of the lower part of the head of the machine, the cutting plane being on line 4 4 on Fig. 3. Figs. 10 and 11 are respectively a plan and a rear elevation of the stud-holding sleeve and cap. Fig. 12 is a vertical section on line 5 5 on Fig. 11. Fig. 13 is an inverted plan of said sleeve and cap. Fig. 14 is a section on line 6 6 on Fig. 12 with the pinion-sleeve removed. Fig. 15 is an inverted plan of the pinion-sleeve removed from the outer or cap-holding sleeve. Figs. 16 and 17 are respectively a sectional elevation of the anvil-rod, the clinching-tool and its sleeve, and a plan of the anvil-rod. Figs. 18 and 19 are respectively a plan and an inverted plan of the swiveling yoke for operating the stud-holding sleeve and cap, and Figs. 20 and 21 are respectively a plan and an elevation of the stud-holding cap.

In the drawings, A is the frame or stand,

which is mounted upon a bench or table of suitable height, and has fitted to suitable bearings in its upper portion the vertically-reciprocating setting-plunger *a*, having set in its lower end the clinching-tool *a'* and mounted in its forked upper end the anti-friction roll *a*², as shown in Figs. 2 and 3. The plunger *a* has secured thereon just below its upper bearing a collar, *b*, between which and said upper bearing is a washer, *b'*, of leather or rubber, which serves as a cushion to deaden the blow of the upward movement of said plunger, caused by the reaction of the spring *b*², placed around said plunger between said collar *b* and the lower bearing of said plunger, as shown in Fig. 3.

The upper end of the frame A is forked, so as to form two ears, A' A', in bearings in which is fitted the horizontal pin or short shaft *c*, upon which is mounted the cam-wheel B, having formed upon its periphery a series of cam-teeth or presser-toes, *c'*, which act successively upon the anti-friction-roll *a*² to depress the setting-plunger *a* as said wheel is revolved.

Upon the hub of the cam-wheel B is mounted so as to be freely movable about the axis of said wheel a lever, C, carrying the hooked pawl D, arranged to engage with the nearly radial faces of the cam-toes of said wheel, so as to impart to said wheel a partial rotation about its axis at every downward movement of the rear or movable end of said lever C, said partial rotation at each downward movement of said lever being just sufficient to pass one of the cam-toes over the roll *a*² and depress the plunger *a* and permit said plunger to be raised again by the reaction of the spring *b*².

The rear or movable end of the lever C has pivoted thereto the rod E, the opposite end of which is pivoted to the treadle-lever F, which in turn is pivoted to the stand G, secured to the floor beneath the bench or table, and is connected by the spring H to the frame A or to the under side of said bench in such a manner that normally said treadle F and the lever C will be maintained in the positions shown in Figs. 1, 2, and 3.

In the front lower portion of the frame or stand A, directly beneath the setting-plunger *a*, is set the anvil-rod or stud-support *d*, the

portion of which that projects above the bed of the frame A being eccentric to the axis of the setting-plunger, and having formed in its upper end a cavity or recess, e , eccentric thereto to receive and fit the convex outer surface of the stud-head, and also having formed upon said upper end near its center an upwardly-projecting teat or point, e' , to bear against the outer curved side of the neck of the stud, all as shown in Figs. 16 and 17.

Upon the upwardly-projecting portion of the anvil-rod d is fitted so as to be revoluble thereon the sleeve d' , having the pinion d^2 formed upon or secured to its lower end, and provided above said pinion with the projecting ears d^3 , as shown in Figs. 12, 13, and 15. The sleeve d' has a portion of its wall cut away at its upper end to form a slot, as at e^2 , Fig. 11, to facilitate the insertion of the head of the stud beneath the cap-plate when the sleeve d' and the cap-plate are moved upward. A thin semicircular steel disk, f , is placed upon the top of the sleeve d' , so as to cover the cavity e when in its normal position, and is clamped thereto by the inwardly-projecting lip e^3 on the sleeve g , fitted upon the exterior of the sleeve d' , as shown in Figs. 10, 11, and 12. The sleeve g has formed in its lower end a transverse slot or groove of a width equal to the diameter of the sleeve d' and an annular recess of greater diameter and extending at two opposite sides beyond the sides of said transverse groove, so as to form lips h h , which engage with the lips or ears d^3 on the sleeve d' to clamp the plate f in position on said sleeve d' . The sleeve g also has formed in its exterior the annular groove h' , in which is fitted the rawhide washer h^2 , as shown in Fig. 3.

I is a yoke-plate pivoted by the screw-pivot i to the vertical rod I' , and provided with the curved slots i' and i^2 , the former of which engages with the groove h' in the sleeve g , and the latter engages with the head of a clamping-screw set in the vertical rod I^2 in such a manner that by partially withdrawing said clamping-screw said yoke-plate may be moved about its pivot i to disengage it from the sleeve g whenever it becomes necessary to remove the sleeves d' and g , which are secured against accidental separation by the set-screw i^3 , as shown in Figs. 10, 12, 13, and 14.

The rods I' and I^2 are each provided with an enlarged lower end or head, i^4 , fitted to an enlargement of the bearing in the frame A, and is surrounded within said enlargement of its bearing with a spring, j , the tension of which forces the yoke-plate I, sleeves d' and g , and the plate f downward to clamp the head of the stud between said plate f and the anvil-rod d when the stud is placed in position and the treadle F is in its normal position, as shown in Fig. 1.

J J are adjustable stop-bolts, which limit the downward movement of the yoke-plate I, as shown in Fig. 2.

K is a lever pivoted at k to the frame A, and having its front or short arm bifurcated and projecting beneath the rods I' and I^2 , with the lower ends of which it engages to raise the yoke-plate I and the sleeves d' and g when the treadle F is depressed by the operator's foot. The rear or movable end of the long arm of the lever K has pivoted thereto the rod K' , the lower portion of which is flattened and has formed therein the slot l , into which projects a pin, l' , set in the block K^2 , adjustably secured upon the rod E by means of the set-screw l^2 , as shown in Figs. 1, 3, 5, and 6.

L is a lever pivoted by the vertical pin m to the underside of the frame A, and provided with the pendent bifurcated arm L' , in which is mounted upon the horizontal pin m' the cam-latch n , which is normally held in contact with the stop-pin n' by the spring n^2 , and serves as a fixed cam to be acted upon by the roll o , carried by the lever K, to move the lever L about its pivotal axis when the rear end of the lever K is depressed by the operator placing his foot upon the treadle F, and when the center of the truck o has passed the apex or corner o' of the cam n the tension of the spring n^2 is overcome and the cam n is moved about its axis in the direction indicated by the arrow on Fig. 7, and the lever L is moved in the opposite direction by the tension of the spring o^3 , while the treadle F and the rear arm of the lever K are still held in their lowest depressed positions by the operator's foot remaining on the treadle-pad. The forward end of the lever L has set therein the pin p , which projects into the slot o^3 in the free end of the lever p' , which is firmly secured upon the lower end of the short rocker-shaft q , mounted in a bearing in the front lower portion of the frame A, and upon the upper end of said shaft is secured the gear-segment r , the teeth of which engage with the teeth of the pinion d^2 in such a manner that at each vibration of the lever L the sleeves d' and g will have imparted thereto a semi-rotation and return.

The slotted portion of the rod K' has adjustably secured thereto the plate l^3 , the lower end of which covers a portion of the slot l , thus determining the working length of said slot and the distance which the rear end of the lever K will be moved upward by the pin l' after the yoke-plate I has been brought into contact with the stop-pins J J by the tension of the springs j .

The lever K is provided with the adjustable stop-screw s , which limits the upward movement of the front end of said lever in an obvious manner.

The anvil-rod d may be adjusted vertically by the set-screw t , and when properly adjusted may be firmly secured in position by the set-screw s' .

The clinching-tool a' has mounted thereon the sleeve a^3 so as to be movable thereon, a spring, a^4 , being arranged to force said sleeve downward on said tool and hold it normally in position with its lower end projecting be-

low the lower end of the clinching-tool and to yield when said sleeve comes in contact with the material and allow the clinching-tool to complete its movement, while the sleeve remains stationary. The sleeve a^3 is secured to the clinching-tool a' by the pin a^5 , set in said tool and projecting through the slot a^6 , all as shown in Figs. 3 and 16.

A shield, N, (shown in section in Fig. 3,) covers the yoke-plate I and serves as a work-supporting table and extends downward in front of the lever K, to prevent oil being thrown upon the work being operated upon.

We are aware of the Letters Patent No. 329,264, and do not claim anything therein contained.

The operation of our machine is as follows: The parts being in the position shown in the drawings, the operator places her foot upon the treadle and depresses it until its front end rests upon the stop O, when the pocket d' $g f$ is raised above its normal position. She then places the stud to be set in position with its head beneath the plate f and its neck toward the rear of the machine, when she removes her foot from the treadle and the spring H raises the treadle and the lever K, and the springs $j j$ move the pocket downward, causing the plate f thereof to clamp the head of the stud between it and the anvil. She then places the material in which the stud is to be set over the shank of the stud, and in case it is a glove-stud that is being set she places the metal washer over the shank of the stud upon the kid or other material and then depresses the treadle again. The result of this last depression of the treadle is, that the shank of the stud is clinched and the pocket is turned about its axis one-half of a revolution, thereby placing the plate f thereof at the rear of the neck of the stud, when she removes the work before the pocket is returned to its normal position by the tripping of the cam-latch n and the reaction of the spring o^2 when the pocket is raised. She retains her foot upon the treadle in its depressed condition until another stud is inserted under the plate f , when the operation is repeated. The raw-hide washer h^2 (shown in Fig. 3) is used for the purpose of lubrication, because oil cannot be used about the revolving pocket without danger of spoiling the gloves to which the studs are being applied.

It is very desirable that the lacing-studs when applied to gloves should be set with a uniform pressure, so that when set the hooks shall present uniform openings for the admission of the lacing-cord under the head of the stud. This has been found to be impossible with the machines heretofore in use, in which the setting-plungers were depressed by a lever resting upon the upper end of the setting-plunger and vibrated by the operator's foot depressing a treadle connected therewith. To obviate this difficulty and insure an even and uniform setting of the studs is the object of employing the cam-wheel B and pawl D for

imparting thereto an intermittent rotary motion, which, by virtue of the fact that all of the toes c' of said cam are of uniform length, insures a perfect uniformity in the setting of the studs.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with a setting-plunger and a spring for moving said plunger upward, a cam-wheel having formed upon its periphery a series of cam-shaped teeth or presser-toes arranged to act successively upon said plunger to depress it, and a pawl carried by a vibrating lever and constructed and arranged to engage with said cam-teeth and impart to said cam-wheel an intermittent rotary motion.

2. In a machine for setting lacing-studs and other similar articles, the combination of a setting-plunger, a cam-wheel provided with a series of cam-teeth or presser-toes, a lever mounted upon and movable about the same axis as said wheel, a pawl carried by said lever and engaging with the cam-teeth of said wheel, a treadle-lever, a rod connecting said treadle-lever with said first-named lever, and a spring constructed and arranged to move said treadle upward after it has been depressed by the operator's foot.

3. The combination of the sleeve d' , provided with slot e^2 and the ears $d^3 d^3$, the semi-circular plate f , and the sleeve g , provided with the semi-annular lip e^3 and the lips $h h$, all constructed, arranged, and operating substantially as and for the purposes described.

4. The combination of a fixed anvil having a recess in its upper end to fit the convex outer surface of the head of a lacing-stud, an outer and an inner sleeve secured one within the other and mounted upon said anvil, a semi-circular plate clamped between said sleeves and projecting over a portion of the upper end of said anvil in position to enter between the head and inner collar of the stud to be set, a pinion formed upon or secured to one of said sleeves, and means, substantially as described, for imparting to said pinion and sleeves an intermittent semi-rotation about said anvil.

5. The combination of the fixed anvil d , provided with the recess e , the sleeve d' , provided with the pinion d^2 , the ears $d^3 d^3$, and the slot e^2 , the semi-circular plate f , resting upon the top of the sleeve d' , the sleeve g , provided with the lips e^3 and $h h$ and the circumferential groove h' , the yoke-plate I, rods I' and I^2 , the springs $j j$, the lever K, provided with the roll o , the gear-segment r , engaging said pinion d^2 , the rocker-shaft q , the levers p' and L, the cam-latch n , the slotted pendant K' , the rod E, the adjustable pin l' , carried by said rod E and engaging with said slotted pendant, the treadle F, and spring H, all constructed, arranged, and operating substantially as and for the purposes described.

6. In combination with a fixed anvil and a reciprocating setting-plunger, a stud-holding pocket or carrier mounted upon said anvil

and revoluble about an axis eccentric to the axis of said setting-plunger, substantially as described.

7. In combination with a fixed anvil and a reciprocating setting-plunger, a stud-holding pocket or carrier mounted upon said anvil and movable vertically thereon and revoluble about an axis eccentric to the axis of said setting-plunger.

8. In combination with the fixed anvil and vertically-movable and semi-revoluble stud pocket or carrier, the yoke-plate I, pivoted at one end and provided with the curved slots i' and i'' , substantially as described.

9. In combination with a fixed anvil and a vertically-movable and semi-revoluble stud pocket or carrier, a cam-wheel provided with a series of cam-teeth or presser-toes, a pawl and pawl-lever for intermittently moving said wheel, a pocket-raising yoke-plate, rods and springs for depressing said yoke and pocket, a pinion connected with said pocket, a gear-segment engaging said pinion, a lever for raising said pocket provided with an anti-friction roll, a lever for vibrating said gear-segment provided with a pivoted cam constructed and arranged to be acted upon by said anti-friction roll to move said last-mentioned lever in one direction and to yield to permit the reverse

motion of said lever, a spring for causing said reverse motion, a treadle-lever, a spring for maintaining the free end of said treadle normally in an elevated position, a slotted pendent rod pivoted to the pocket-raising lever, and a rod connecting the treadle and pawl-carrying lever and carrying a pin constructed and arranged to engage the slot in said pendent rod, all so constructed, arranged, and operating that a single downward movement of the treadle will cause a depression of the setting-plunger, a semi-rotation and return of the stud pocket or carrier, and an upward movement thereof.

10. The combination of the semi-revoluble and vertically-movable pocket or carrier d' g f , provided with the circumferential groove h' , the yoke-plate I, embracing said pocket or carrier, and the rawhide washer h'' .

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 9th day of October, A. D. 1888.

MELLEN N. BRAY.
EVERETT M. POPE.

Witnesses:

N. C. LOMBARD,
WALTER E. LOMBARD.