

(No Model.)

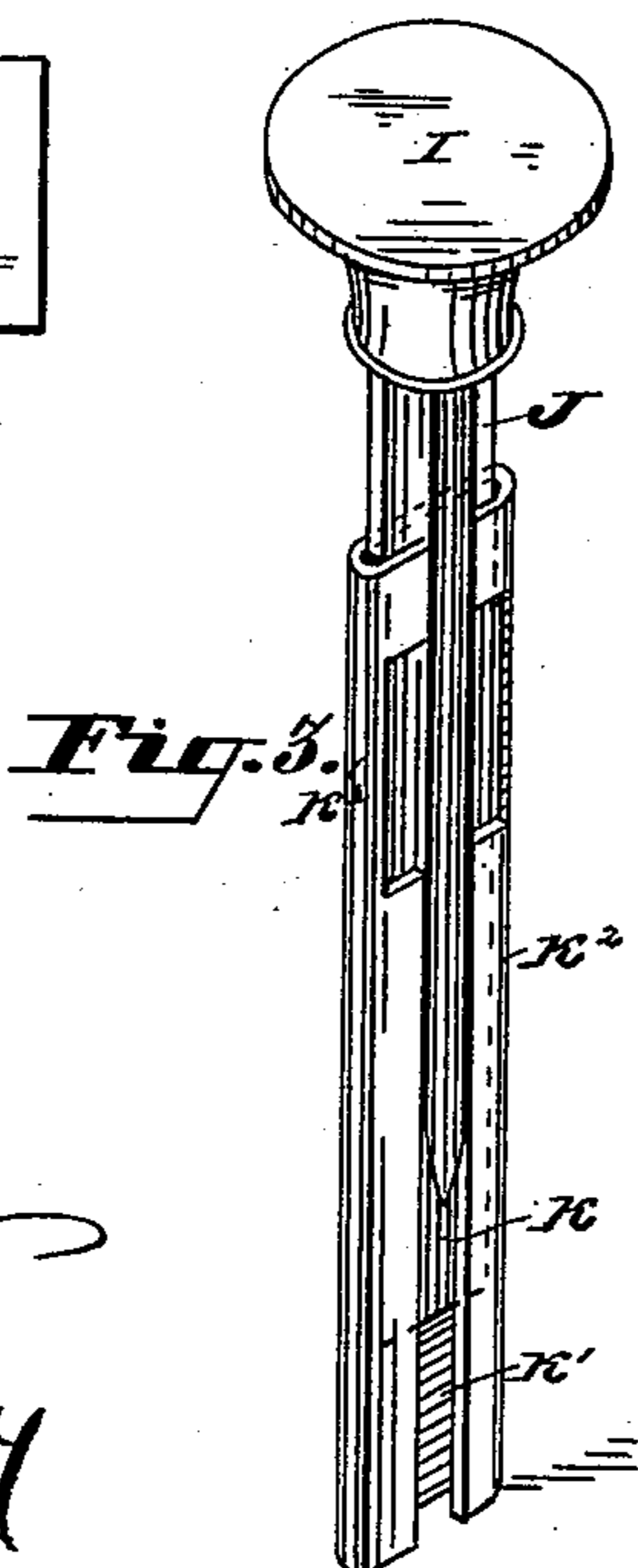
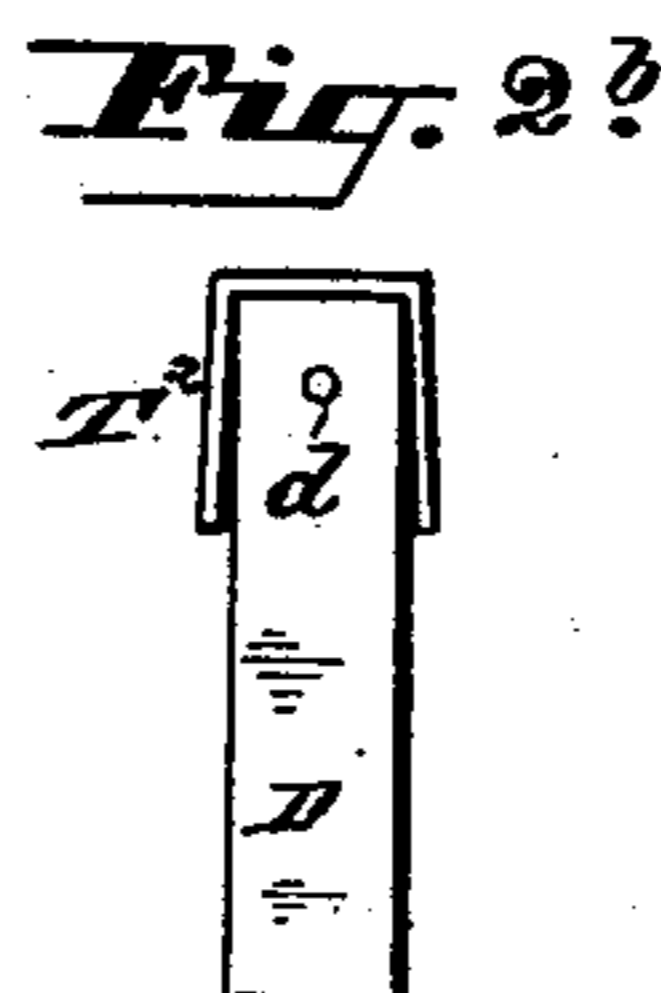
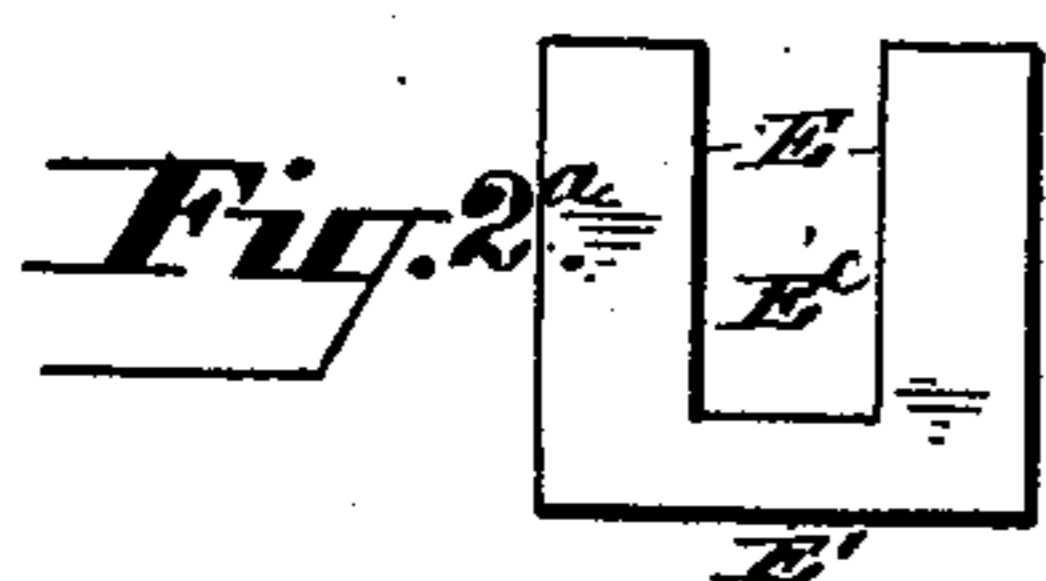
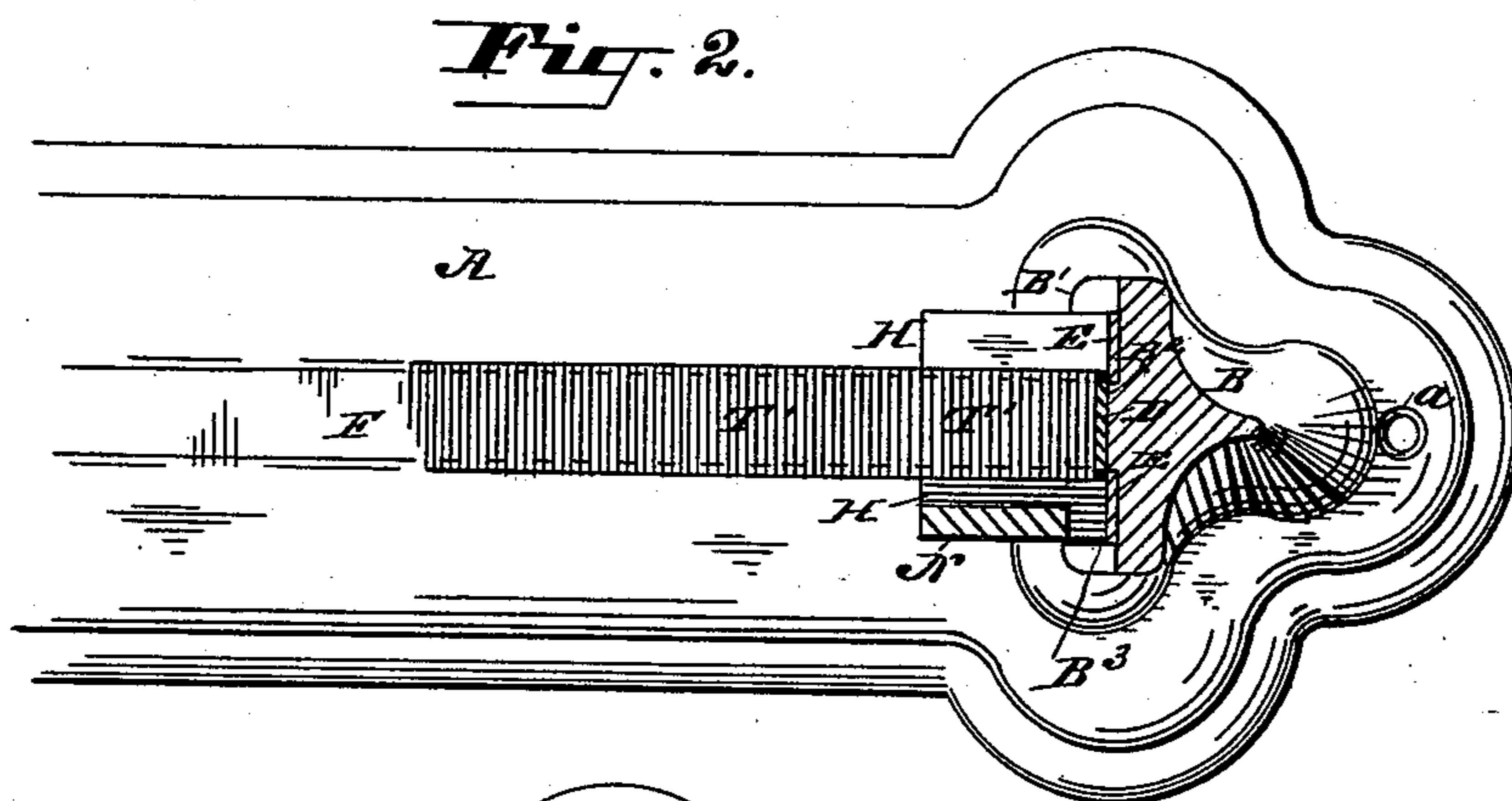
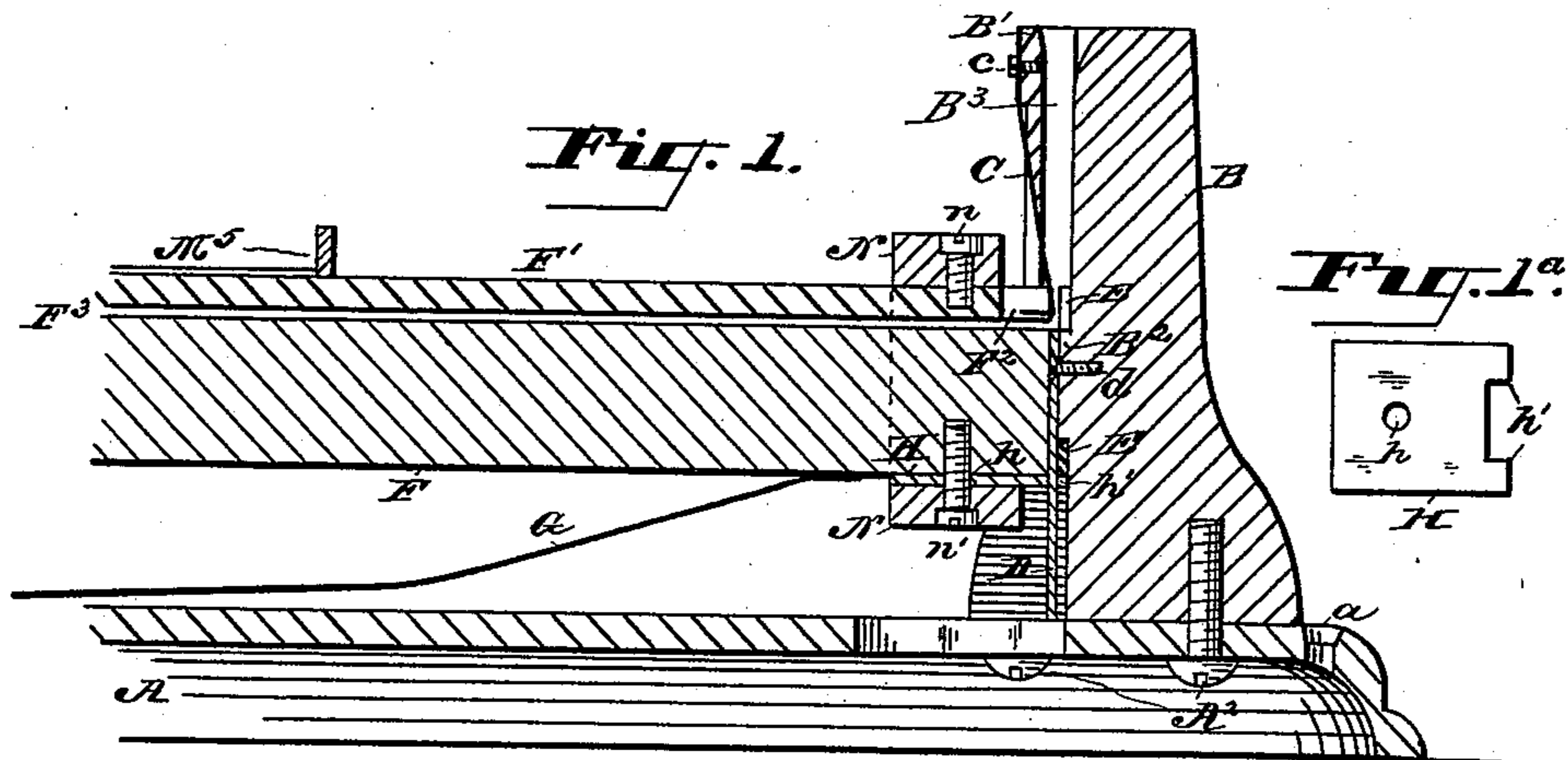
2 Sheets—Sheet 1.

I. W. HEYSINGER.

DEVICE FOR AUTOMATICALLY SUPPLYING STAPLES TO INDEPENDENT
OR DETACHABLE STAPLE DRIVERS.

No. 363,957.

Patented May 31, 1887.



WITNESSES:

Sus. Helen
 Juliana Pussey

INVENTOR

Isaac W. Haysinger

(No Model.)

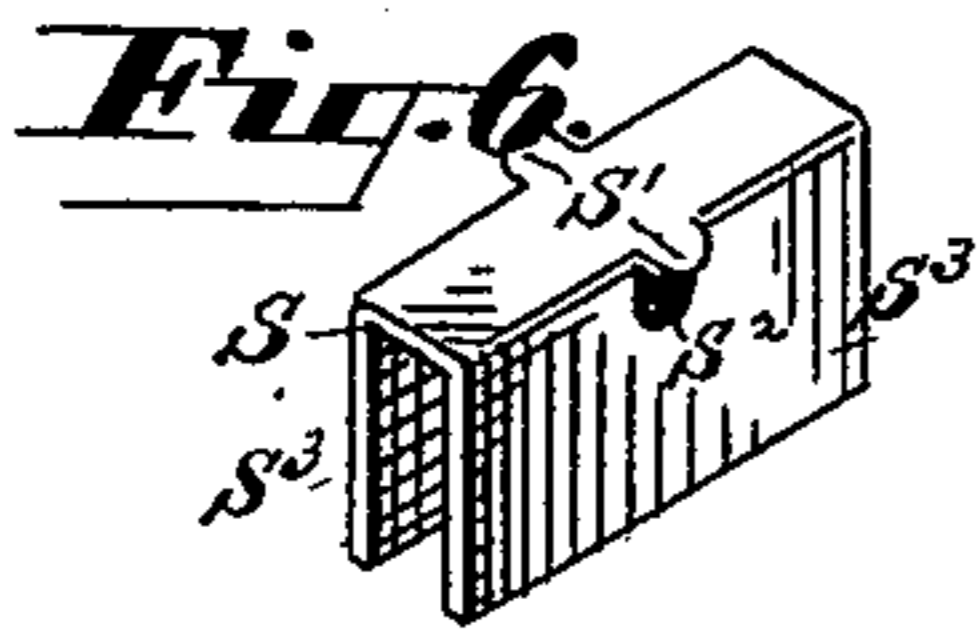
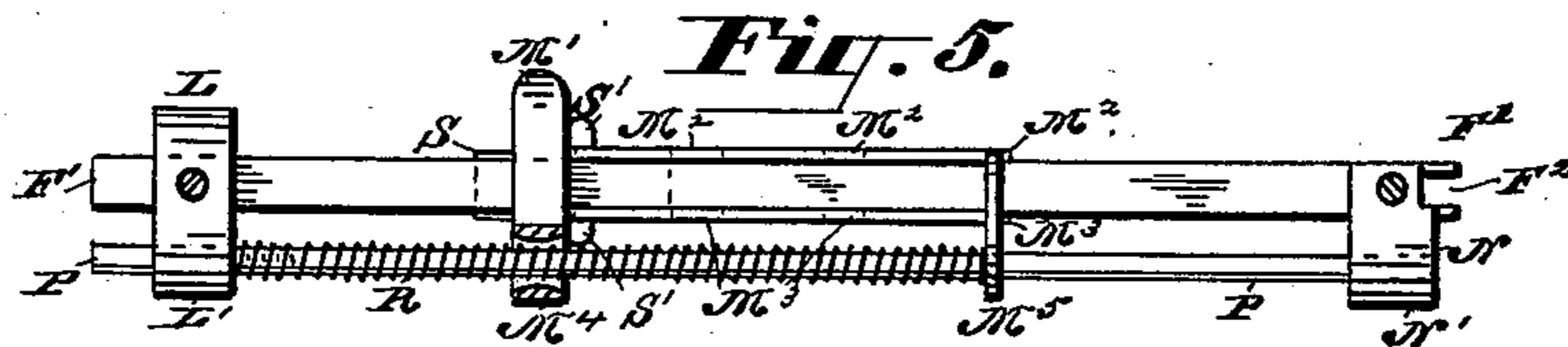
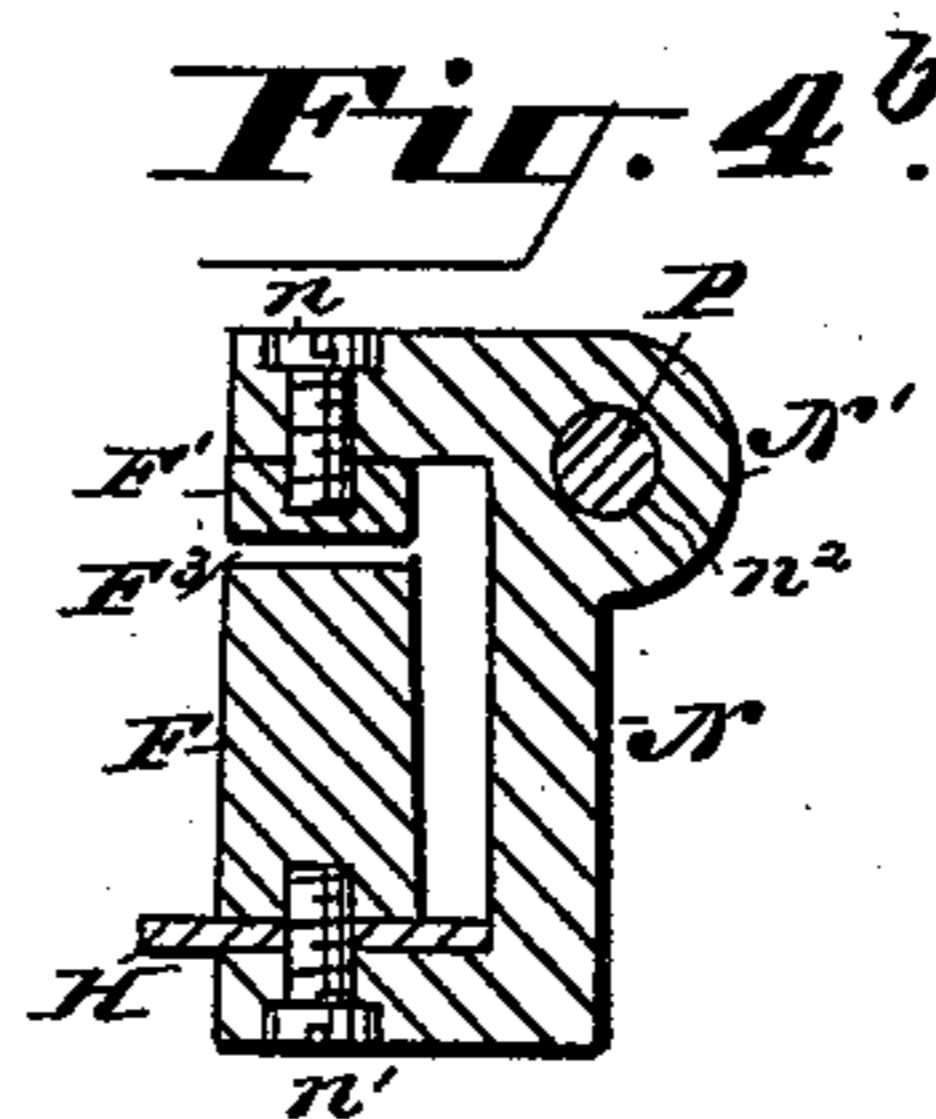
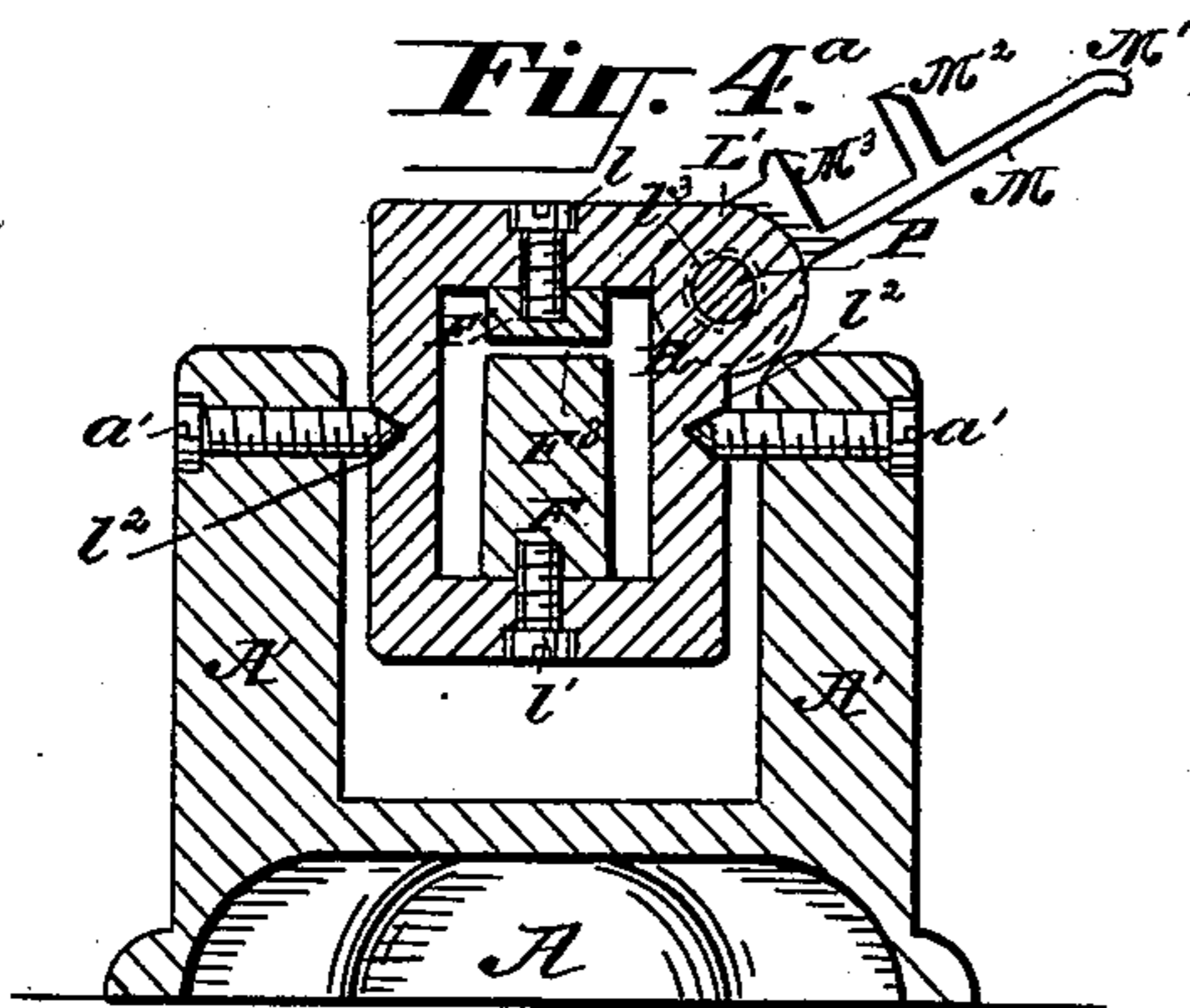
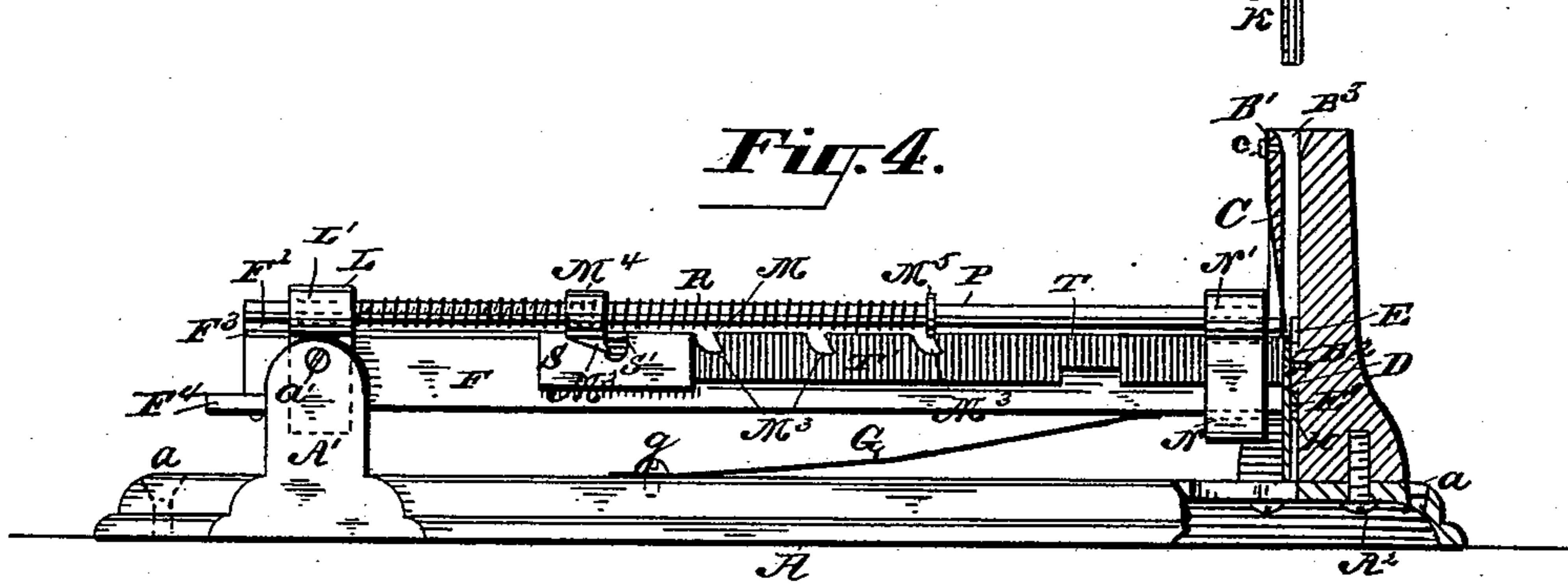
2 Sheets—Sheet 2.

I. W. HEYSINGER.

DEVICE FOR AUTOMATICALLY SUPPLYING STAPLES TO INDEPENDENT
OR DETACHABLE STAPLE DRIVERS.

No. 363,957.

Patented May 31, 1887.



WITNESSES:

Mrs. Mason.
 Joshua Pursey.

INVENTOR

Isaac W. Heyinger

UNITED STATES PATENT OFFICE.

ISAAC W. HEYSINGER, OF PHILADELPHIA, PENNSYLVANIA.

DEVICE FOR AUTOMATICALLY SUPPLYING STAPLES TO INDEPENDENT OR DETACHABLE STAPLE-DRIVERS.

SPECIFICATION forming part of Letters Patent No. 363,957, dated May 31, 1887.

Application filed October 13, 1886. Serial No. 216,133. (No model.)

To all whom it may concern:

Be it known that I, ISAAC W. HEYSINGER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Devices for Automatically Supplying Staples to Independent or Detachable Staple-Drivers, &c., of which the following is a full, clear, and exact description, reference being had to the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a longitudinal vertical sectional view through the working parts of a device embodying my invention, the hinged rear end and the attachments for moving up the series of staples having been removed. Fig. 1^a is a view of the finger-piece H of Fig. 1 detached from the bar F. Fig. 2 is a transverse longitudinal view of the parts shown in Fig. 1. Figs. 2^a and 2^b are enlarged views of the parts E and D. Fig. 3 is a perspective view of one form of staple-driver now in general use, and which is adapted to operate in connection with the supplying device, as shown. Fig. 4 is a side view on a reduced scale, partly in section, of a device in complete form embodying my invention. Fig. 4^a is a view of the rear cradle and its supports, and Fig. 4^b of the front cradle, which together support the staple-feeding bar and the guide-flap, and between which is the staple-guiding slot F³. Fig. 5 is a top view of the guide-flap F' and adjacent parts. Fig. 6 is a view of the follower, which occupies the staple-slot and pushes the series of staples along the same; and Fig. 7 shows different sorts of staples adapted to be used with the devices shown.

The lettering in all the figures is uniform.

My invention relates to the construction and operation of a device by means of which metallic staples—such as are used for fastening sheets of paper together in offices, binding up pamphlets, fastening boxes, putting down carpets, upholstering furniture, &c.—may be automatically supplied to and inserted into an independent or detachable staple-driver, in which the staples are inserted singly and used one at a time, having the staple-holding channel separately supplied at its open end with a staple after the previous one has been driven, in contradistinction to the staple-driving devices, which either take their staples from a

reservoir behind the driver or make their own staples and drive them successively as soon as made.

The class of staple-drivers for which my invention is adapted have heretofore had the staples inserted singly by hand at the open end of the staple-channel crown foremost, the plunger afterward driving out the staple, and being again supplied by hand as each staple is driven. Notwithstanding the loss of time occasioned by having to pick up each staple separately from a box, stick, or pile of staples and insert the same into the driver, these staple-drivers have come largely into use, as they are cheap to make, simple to operate, and light and convenient to handle. A type of these staple-drivers used, if desired, with a separate clinching device, is shown in my Letters Patent of the United States No. 226,402, dated April 13, 1880, in which the construction and mode of operation are clearly set forth; and such staple-drivers are shown in Fig. 3 of the present drawings, and are adapted to be used with the device, as shown in the other figures. Any of the forms of independent staple-drivers in use may be used instead, however, the parts being enlarged or modified to fit the same, and also to supply staples having more than two prongs, or a single stem instead of a pair of legs, or staples with enlarged heads, or which have their legs constructed to be bent outward in clinching instead of inward, and fastening devices of other kinds adapted to be used with a driver supplied in the manner described.

Referring to the drawings, in Fig. 4 the device is shown as it stands upon the desk, table, or floor ready for use, the staple-driver (part view) being shown suspended over the guide-channel B³ and ready to be inserted therein to receive a staple from the series T T' T', strung upon the staple-feeding bar F.

The invention, as shown, may be described as consisting of a longitudinal staple guiding and feeding bar, with a guide-flap above it having a staple-guiding slot or groove between the bar and the guide-flap, in which slot a number of staples are carried in series, and which are moved forward to the front as a vacancy occurs from the removal of a preceding staple. This bar F is pivoted at its rear end to a base and vibrates vertically at its front

end, being supported by a spring, G. A spring-follower, S, carries the series of staples along the slot, the legs of the staples hanging down on each side the bar and guarded above by the guide-flap. The follower is moved forward by a suitable spring. Facing the front end of the staple-holding bar is an upright post of the same cross-section, and behind this is a vertically-sliding plate to prevent the spring which feeds the staples along the bar from carrying the forward staple over the top of the post D and into the space to be occupied by the case of the driver when pressed down from above.

Above the free or vibrating end of the staple-feeding bar and over the post D is a vertical guide channel or hopper, to direct the staple-driver downward at the proper place. The operation is as follows: The spring-follower moves the series of staples forward until the crown of the front staple is pushed out of the slot F³ and rests upon the top of the post D, the legs hanging down each side. The driver to be supplied with a staple, being inserted into the guide-channel B³, pushes down the front end of the staple-holding bar F F' and the vertically-sliding plate E behind the post D. The post, remaining fixed, inserts itself at its upper end into the channel of the staple-driver K, carrying with it the staple which is suspended upon it. When the driver is removed, the slight outward spring or flare of the legs of the staple T² holds the same in place in the channel of the staple-driver when it is withdrawn from the channel B³ of the device. The spring G carries up the end of the bar F and the plate E. The spring R moves up the series of staples until a new one occupies the post D, and the operation is repeated as often as the preceding staple has been expelled from the staple-driver and there are other staples upon the bar of the machine.

The staple-bar F, I prefer to construct with a separate top part or guide-flap, F', having a longitudinal transverse slot, F³, between the bar and the guide-flap, extending from end to end and open front and rear, and of a size to freely admit the insertion of the crowns of a series of staples, the legs of which hang downward upon each side of the bar F.

To hold the bar F and the guide-flap F' in place, I provide a support or cradle at each end, as shown in Figs. 4^a and 4^b, which I make open on the inside and attach the bar F to the bottom and the guide-flap F' to the top, so as to leave room on the sides for the insertion of a series of staples from the rear, and also to admit the follower S. (Shown in Figs. 4, 5, and 6.) The front cradle, N, does not extend entirely around the bar and flap, but one side is left open to show the staples in place as they pass through the slot F³, and admit of their ready removal should a defective one be encountered, or for other reasons; but the opposite or rear cradle, L, I carry entirely around F and F', and provide sockets l' l' at the sides thereof, by means of which I pivot it to the

raised supports A' A' of the base A. The screws attaching these various parts are shown at a' a', l' l', and n n', though any other well-known means of attachment may be used, if desired. The cradles L and N are each shown with a laterally-projecting lug or ear, L' and N'.

From L' to N', between the cradles, extends a rod, P, along the bar F, upon which is a coiled spring, R, closely but freely fitted thereto. The spring R acts upon a slide, M, so that when the slide is drawn backward the spring will carry it again to the front when released. The manner in which I prefer to construct the spring and follower is as follows: The slide M has two projecting bearings, M⁴ and M⁵, Fig. 5. M⁵ fits closely to the rod P, and the spring R impinges against it from behind. M⁴ is enlarged sufficiently to allow the spring R to pass through it, and the sides of the opening are rounded, so that it will slide freely to and fro upon the coiled spring R, which in turn slides upon the rod P. The slide M is made of considerable length, as shown, and has a thumb-piece, M', by means of which it can be drawn back and forth, or raised up to free the follower S, Fig. 4^a.

On each side the space occupied by the guide-flap F', when the slide M is in place, extending from one end of the slide M to the other, is a light bar or strap, and to the under side of these bars of M, at various places along the same, are downwardly-projecting studs M² M² M³ M³ opposite each other in pairs and hooked toward the front to prevent their escape from the wings S' of the follower S, with which they engage. By this construction I can vary the tension of the spring R upon the series of staples in the slot F³ at will, as I can hook one or another pair of the hooks M² M³, according as I require to increase or diminish the tension of the spring. The follower S, I clearly show in Fig. 6, and the same is shown in place in Figs. 4 and 5. I prefer to make it of a light plate of brass or other metal, which I strike up from the sheet, having the sides S³ S³ bent down at right angles nearly, and the wings S' S' cut from the sides at S² and left standing, as shown. I construct these wings S' S' near one or the other end, or in the middle, as I prefer.

The above-described rod P, spring R, slide M, follower S, and staple-guiding bar and flap F F', operating substantially as is herein shown and described, I not only use for the specific invention herein fully set forth, but also apply the same to all sorts of staple-feeding mechanism for self-feeding staple-inserting machines and for other like purposes to which the feeding devices may be applicable; and I prefer to use it in the self-feeding staple-inserting machines secured to me by Letters Patent of the United States No. 349,093, dated September 14, 1886, for which I have it much superior in effectiveness, convenience, and cheapness of construction to those heretofore used in similar machines. When, in such machines, the staple-bar is not constructed to vi-

brate, I attach the rod P to the frame of the machine instead of the cradles shown. I sometimes also reverse the spring R, making it draw from the front of the bar F instead of thrust from the rear.

It will be seen in Fig. 4 that the base A extends forward the whole length of the machine, and I provide holes *a a* at the ends, whereby the machine may be attached to a table or hung up against the wall, as desired, which is often the case, especially in offices or elsewhere when a number of feeders are used, each carrying staples of a different length of legs, which may be used with the same driver for miscellaneous purposes, according to the bulk or thickness of the material to be stapled.

Upon the base, Figs. 1 and 4, I provide a spring, G, attached at *g*, and supporting at its front end the staple feed-bar F against the downward pressure of the driver K as it descends in the channel B³ and impinges with its case upon the front end of F' and the top of E. At the front end of the base A is an upright, B, attached, as shown in Fig. 4, by one or more screws or rivets, A², to the base A. This upright B extends above the bar F and its attachments, and is provided with a vertical channel, B³, over the front end of the bar F, the post D, and the sliding plate E, which I expand at its upper end to insure easy guidance of the driver K to the channel B³ in its more closely-fitted portion below. For convenience, I usually form the channel B³ by joining a front and back piece, B and B'; but the upright B may be formed in one piece, if desired, with the channel B³, cored or otherwise made in the same. In its lower half the upright B is left open behind to allow the free end of the bar F to play up and down therein, but at its upper part is closed to form the channel B³, and against the underside of this closed part the bar and flat F F' impinge as they rise, and their upward motion is thereby arrested at a point where the top of the post D is on a level with the top of the bar F', as shown in Fig. 4.

The staple supporting and inserting post D is attached to the front side of the upright B, within the same, and for this purpose I provide an extension or projection, B², Fig. 2, against which the post D is firmly screwed at *d*. This projection B² is narrower than the face of the post D, and in the recess behind the said post and on each side the same there plays up and down the vertically-sliding plate E, which is bifurcated in its upper part, but united at E' below. (See Fig. 2^a.) The extension B², to which the post D is attached, only projects downward sufficiently far to reach the lower part of the bifurcation of the plate E and give a secure seat to D against the projection B², so that the vertically-sliding plate E E' is supported as it rises by the impingement of E' against the under side of said projection, and in its descent the arms E E are guided by the sides of the same. When the driver K is inserted in the channel B³, the rear

side of the case of the driver engages with the top surface of the front end of the guide-flap F', and at the same time the front side of the driver-case, alongside the groove K', engages with the tops of the bifurcated plate E E, and carry down both the free end of the staple-bar and the plate E, the groove of the driver being guided alongside the projection B², and the top of the post D passing into the staple-channel of the said driver. A staple suspended upon the post D will be inserted into the staple channel by this operation in proper position for driving into papers, carpet, or other material, and be retained therein by the outward spring of its legs against the sides of the staple-channel, or by friction if the fit be a close one. The projection B² thus serves as an additional guide to the staple-driver and insures the insertion of the post D into the staple-channel thereof.

When a staple-driver without a side slot is used, the post D should be attached to the base below, and not against the upright B and the projection B², and the bifurcation of E will be dispensed with. It is much stronger, however, in its present form when light wire staples are used, as the post D cannot be forced back against the plate E by the thrust of the spring R.

To raise the sliding plate E to its proper place, I attach to the free end of the staple-bar F, underneath, a forwardly-extended finger-piece, H, which is also bifurcated at its forward end, as shown at *h' h'*, and which bifurcations embrace the sides of the post D, Fig. 1^a, and assist in accurately guiding the vibrating end of bar F in a vertical plane. The bifurcated ends *h' h'* extend behind the sides of the post D into the space occupied by the sides of the plate E in its descent, and upon the tips of *h' h'* rests the said sliding plate E at its lower end, E', so that when the free end of the bar F has been forced down and released it will not of itself carry down the sliding plate E; but if the said plate E has been carried down by the pressure of a staple-driver upon the top thereof, then, in its ascent, the bar F, by means of the finger H, will again raise the plate E to its place. It is very important to retain this plate E in place during the accidental movements of the free end of the bar F, as otherwise the legs of a staple or the crown would slip back behind the post D and choke the feeding device, or prevent the bar F from fully rising to its place. I prevent the plate E from dropping when the bar F is depressed by mere friction when it is very light, but if heavier a slight magnetization will increase the friction, or a light catch or spring may be used.

The object of the spring C, which may be constructed in various ways, is (see Fig. 4) to prevent a staple from being lifted prematurely from the post D. It is attached to the rear face of the channel B³ at B' by its upper end, and extends downward and forward obliquely, so as to cross the channel B³ in whole or part at

its lower portion, and has its free end bent backward to increase the surface presented over the post D, above which it rests at about the height of a staple's thickness. I slot or notch the front of F' in the middle, as shown at F², Fig. 5, to accommodate the free end of this spring C as it is swept backward by the descent of the staple-driver in the channel B³, by which means the spring is removed from over the post D until the staple-driver has been removed, when, just before a fresh staple is projected from the slot F³ upon the post D, the spring passes over the crown of the staple and holds the same from rising, while the plate E prevents the staple from being pushed backward over the said post D. The front end of the staple-bar may thus be vibrated at will without displacing the staple which at the time may occupy the post D, or the device may be hung upon a wall or inverted without danger.

In certain cases, as for very heavy staples, the spring C may be dispensed with; but for the reasons stated I prefer to use it.

I do not confine myself to the specific form of device shown, as I modify it in various well-known manners to accomplish like purposes, and I sometimes slot the staple-carrying bar F vertically to carry nails, tacks, and other fastening devices, all of which may be readily done by any well-skilled mechanic from the construction and operation of my invention, as hereinabove shown and described.

To supply staples to the slot F³, I usually provide the same strung on sticks or rods, as have been well known for blind-slat and other staples heretofore, and one form of such rod or stick which is well adapted to my present invention has been secured to me by Letters Patent of the United States No. 349,094, dated September 14, 1886, from which stick I pour the staples upon the bar F from the rear, the follower S having been previously removed from the slot F³. At the rear end of the bar F, upon its under side, I usually provide a shelf, F⁴, with slightly-upturned sides, upon which the end of the staple-stick may rest during the operation of supplying the staples to the slot F³.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The device for automatically supplying staples to independent or detachable staple-drivers, consisting of a longitudinally-slotted staple holding and guiding bar pivoted at one end to a base and vibrating vertically at the other, a fixed staple supporting and inserting post adjusted to the free end of said bar and fitted to insert staples in said staple-driver, and a support to prevent the escape of said staples from said post, the whole constructed and arranged to operate substantially as described.

2. In combination, with the base A, having raised pivot-supports A' A' at one end and an upright, B, at the other end provided with upright staple-supporting post D and guide-

channel B³, the longitudinally-slotted staple holding and guiding bar F F', pivoted to the base at a' a' and swinging at its front end opposite the staple-supporting post D, together with a follower, S, and spring or other equivalent feed R M, the whole constructed to move the series of staples T' T' T' along the slot F³ and deliver them singly upon the top of the post D ready for insertion into the open end of a staple-driver, K, when the same has been inserted into the guide-channel B³, substantially as herein shown and described.

3. In a staple-supplying device, in combination with the base A, provided with pivoted supports A' A', and upright B, having staple-supporting posts D and staple-driver guiding-channel B³, a staple holding and guiding bar consisting of the staple-holding part F and the guide-flap F', separated from each other by the guide-slot F³, open from end to end, said parts F and F' being held in place by the cradles or supports L and N, to the inside of which they are secured, the rear cradle, L, pivoted to the bearings A' A' of the base A, the bar F facing at its front end against the staple supporting and inserting post D and vibrating vertically along the said post from its rear bearings, A' A', the same being so constructed that a staple thrust out of the slot F³ will be supported upon the said post D, together with a spring, G, constructed to support the free end of said bar F, the upright B, provided with a limiting stop or shoulder in the rear to arrest the upward motion of the end of F at a point where the slot F³ is on a level with the top of D, said upright B having a vertical channel, B³, in its upper part to admit the descent of an independent staple-driver, and the sliding plate E, moving vertically behind the said post D and limiting the forward motion of the staple, the free end of the slotted staple-bar F F' and the top of the plate E constructed to be impinged upon by the sides of the case of the staple-driver K in its descent and carried down thereby, the post D constructed to enter the channel of the driver K at the same time, and the parts F and E to be restored to place by the spring G or its equivalent, substantially as described.

4. The base A, pivoted supports A' A', upright B, staple-post D, sliding plate E, vibrating staple holding and guiding bar F F', pivoted at a' a' and vertically reciprocating along the front face of D, spring G, and driver-channel B³, in combination with the follower S, constructed to operate in slot F³ and moved forward by the spring R or its equivalent, substantially as described.

5. The spring staple-feed mechanism consisting of the longitudinally-slotted staple holding and guiding bar F F', the follower S, moving along the said slot F³, the lateral rod P, extending along the same, the coiled spring R, and the elongated slide M, swinging laterally and moving longitudinally upon said rod and having the series of hooks or studs

M² M² M³ M³ at various distances to engage with greater or less tension against the follower S, substantially as described.

6. In combination with the bar F, the rod P, surrounded with the coiled spring R, and the slide M, sliding along the rod P by means of the bearings M⁴ and M⁵, the bearing M⁵ closely embracing the rod P and acted upon by the spring R, and the bearing M⁴ being enlarged to pass over and embrace both rod and spring and slide freely to and fro along the same, and having one or more hooks, M² M³, to engage under tension of the spring R with the follower S or other objects adapted to slide along the said bar F, substantially as described.

7. In combination with an independent or detached staple-driver, I J K, having the groove K', the automatic feeding device consisting of the vibrating slotted staple-bar F F', the retracting-spring G, staple-feed mechanism R M S, staple-supporting post D, facing the bar F and the end of the slot F³ and fitted to the said bar F and the channel of the said driver K, and constructed to insert a staple crown foremost, when suspended upon the said post, into the open end or channel of the said staple-driver, said post D being attached to the upright B against the projection B², constructed to form a vertical guide for the slot K' of the staple-driver during its descent, together with the sliding plate E', bifurcated at E E to embrace the sides of the said projection B² behind the margins of the post D and to be forced down by the case of the staple-driver, together with the finger H, extending from the free end of the bar F under the plate E and supporting the same, substantially as described.

8. In combination with the bar F, guide-

flap F', extending along the same, and interposed staple holding and guiding slot F³, the follower S, constructed to enter the said slot and traverse the same, having top plate fitted to the same, side pieces, S³ S³, embracing the sides of the bar F, and projecting wings S' S', the whole struck from a single piece of sheet metal, the flaps which form the wings S' S' being punched from the material of the sides S³ S³, substantially as described.

9. The combination, with the vertically-reciprocating slotted bar F F' F³, base A, upright B, staple-driver guiding-channel B³, staple-supporting post D, sliding plate E, and spring G, of the guard-spring C, constructed to extend across the line of downward insertion of the staple-driver K and over the post D, the said spring C constructed to be pushed aside by the descent of the said driver, substantially as and for the purposes set forth.

10. In a self-feed staple holding and guiding bar, F, the rearwardly-projecting shelf F⁴, constructed to form a seat for the end of a stick of staples as the same is presented at the rear of said bar for pouring the said staples from the said stick from the same, substantially as described.

11. In combination with the vertically-moving slotted staple feed-bar F F' and the staple-supporting post D, the bifurcated finger H, extended forward from the said bar F and embracing by its bifurcated end h' h' the sides of the said post D to accurately guide the vibrating end of the said staple-bar in relation thereto, substantially as described.

ISAAC W. HEYSINGER.

Witnesses:

J. LOREN HEYSINGER,
M. B. FENNINGER.