

(No Model.)

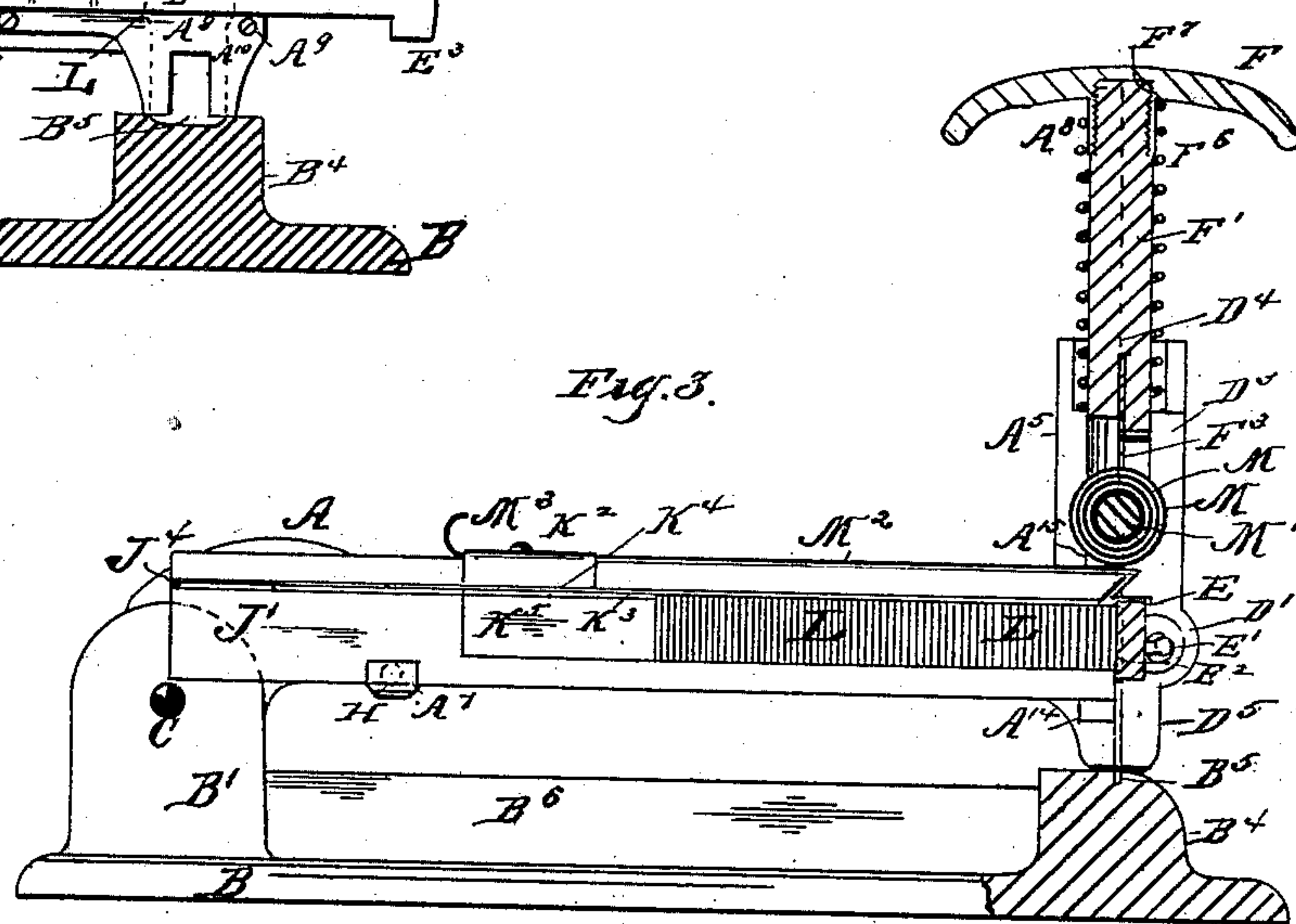
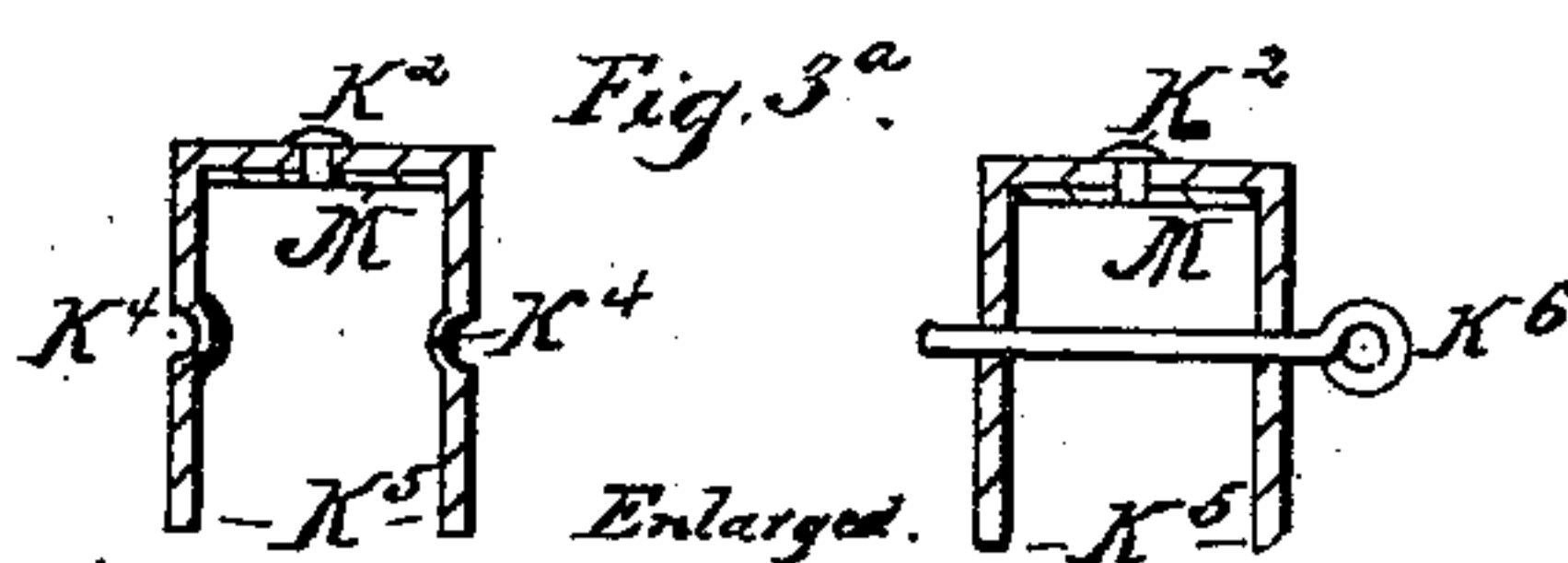
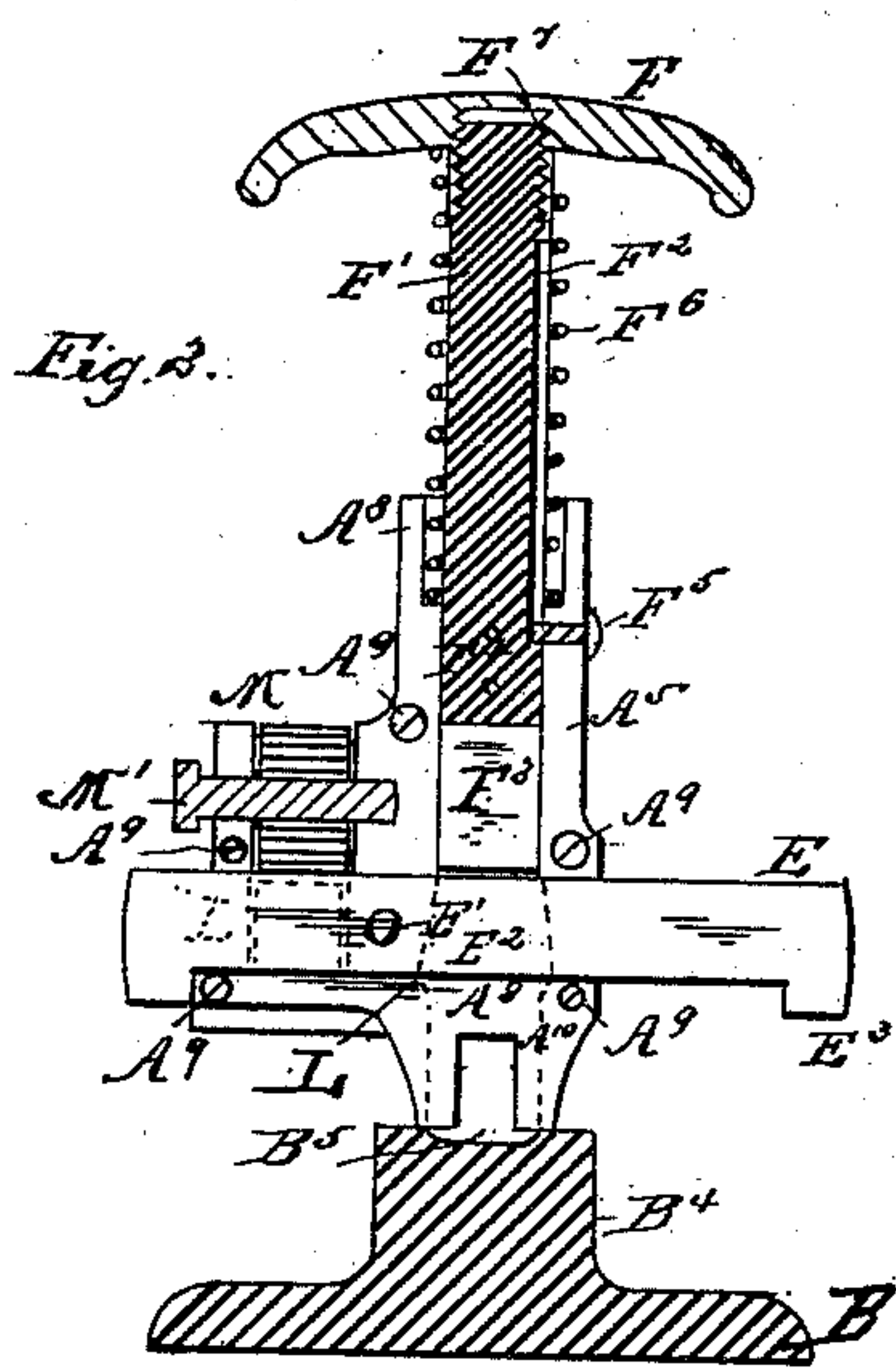
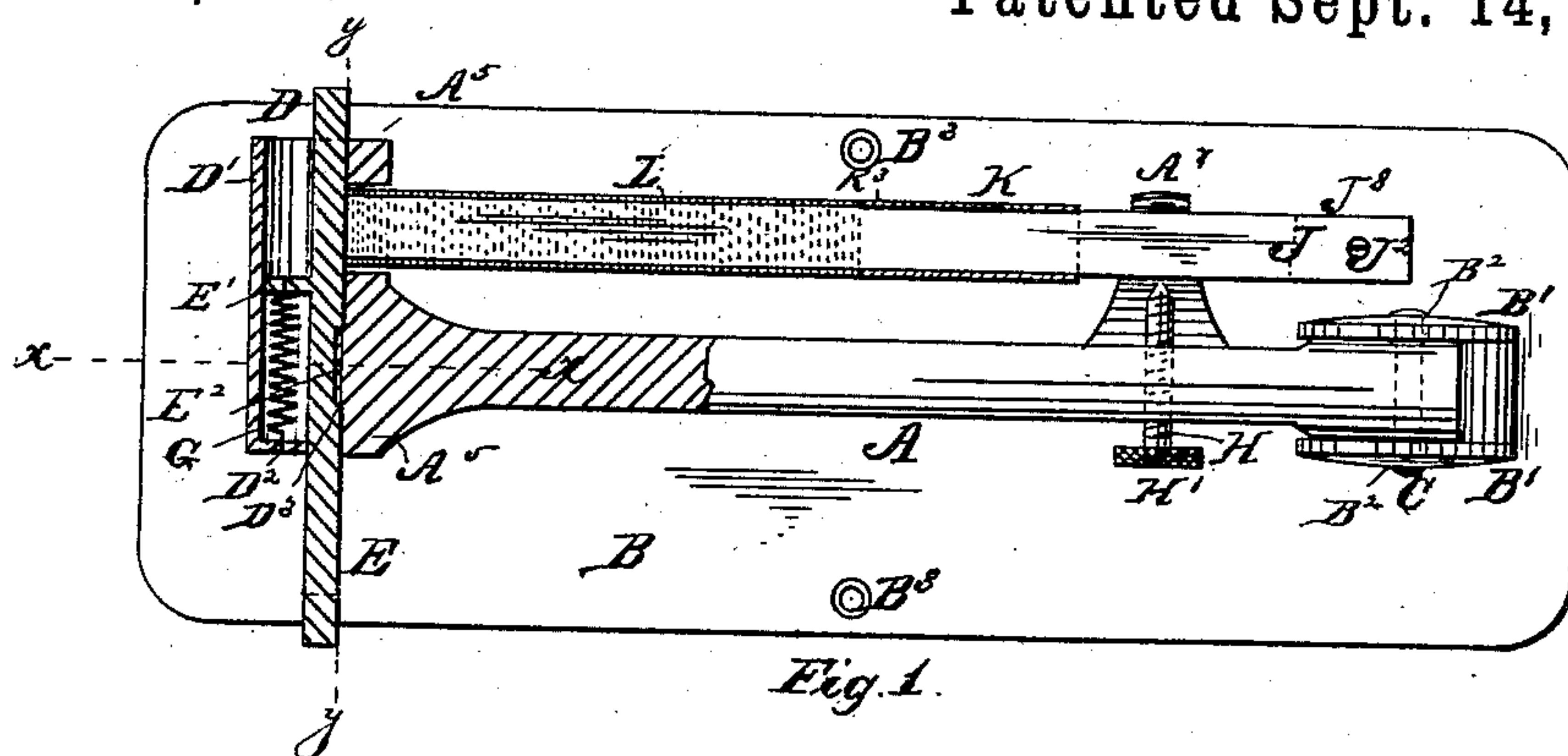
2 Sheets—Sheet 1.

I. W. HEYSINGER.

MACHINE FOR INSERTING METALLIC STAPLES IN PAPER, &c.

No. 349,093.

Patented Sept. 14, 1886.



WITNESSES:

Jno. Nolan.
J. N. Dixon

INVENTOR

I. W. Heysinger.

(No Model.)

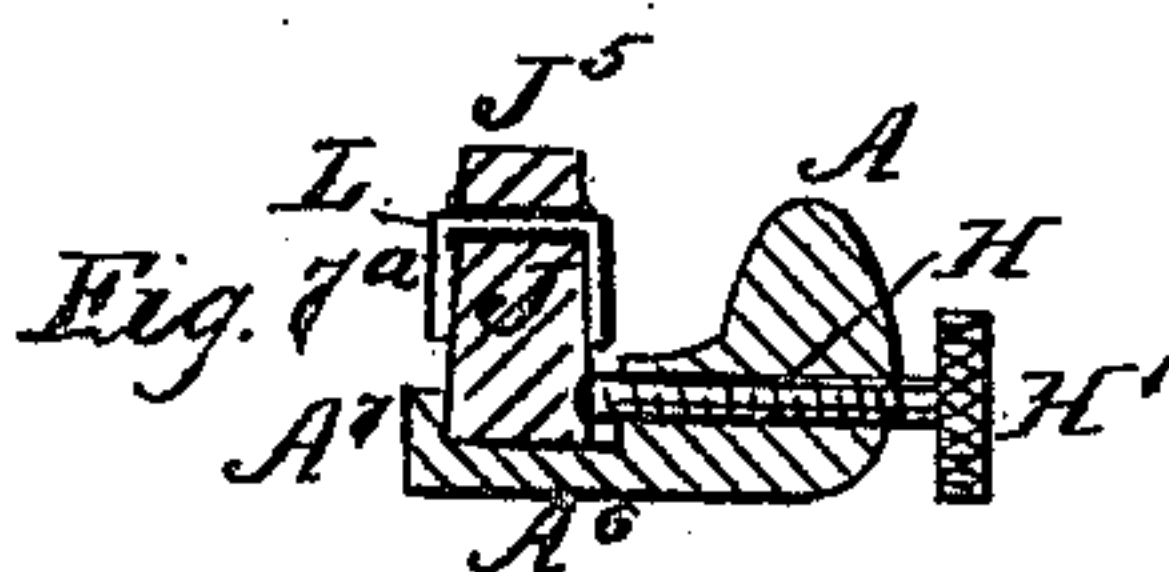
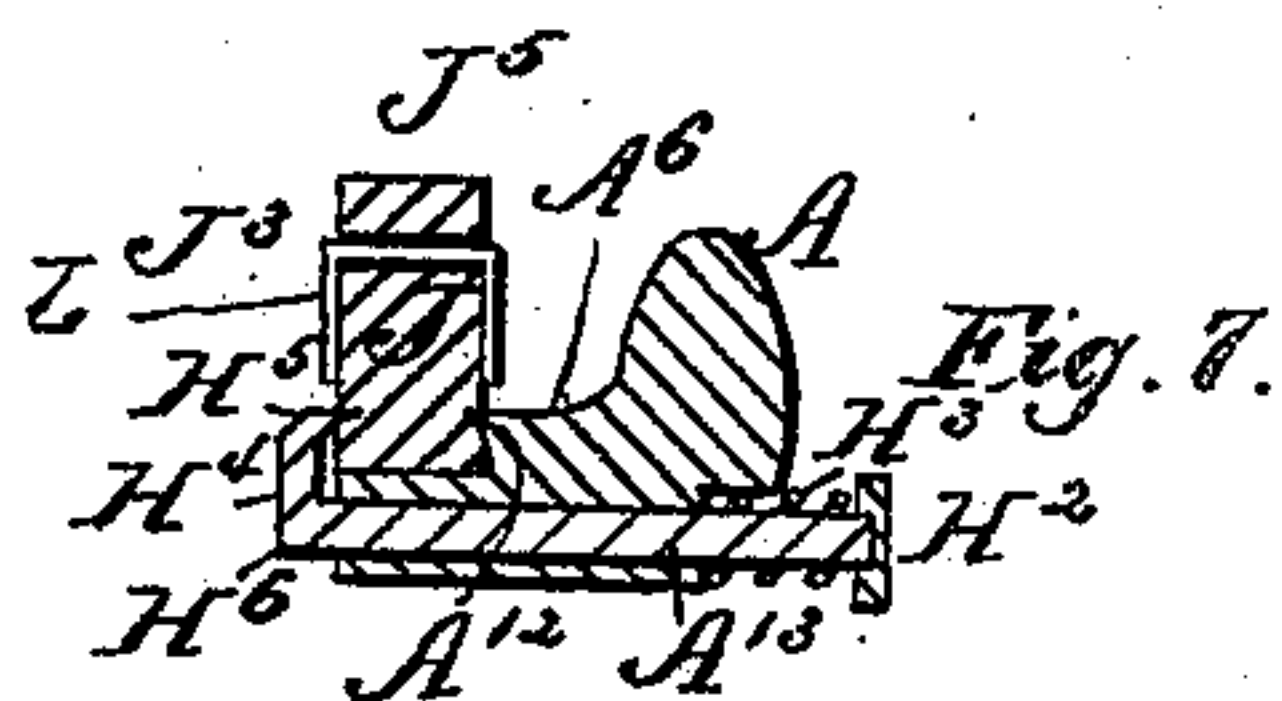
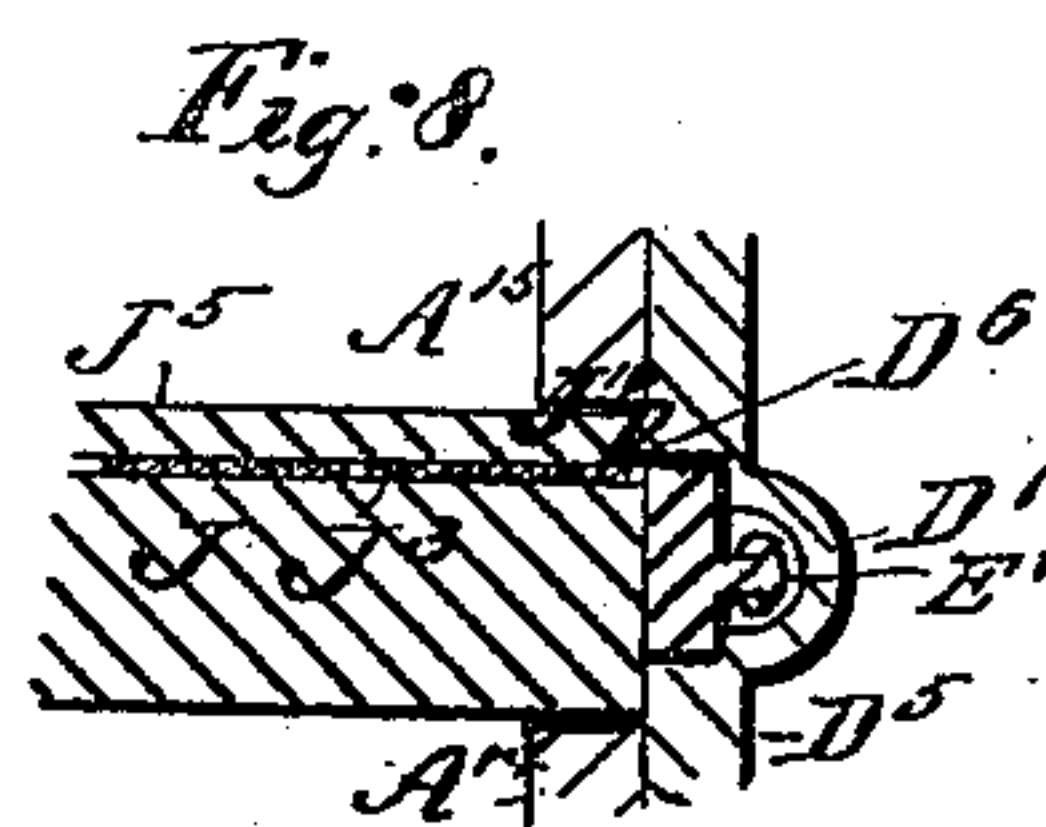
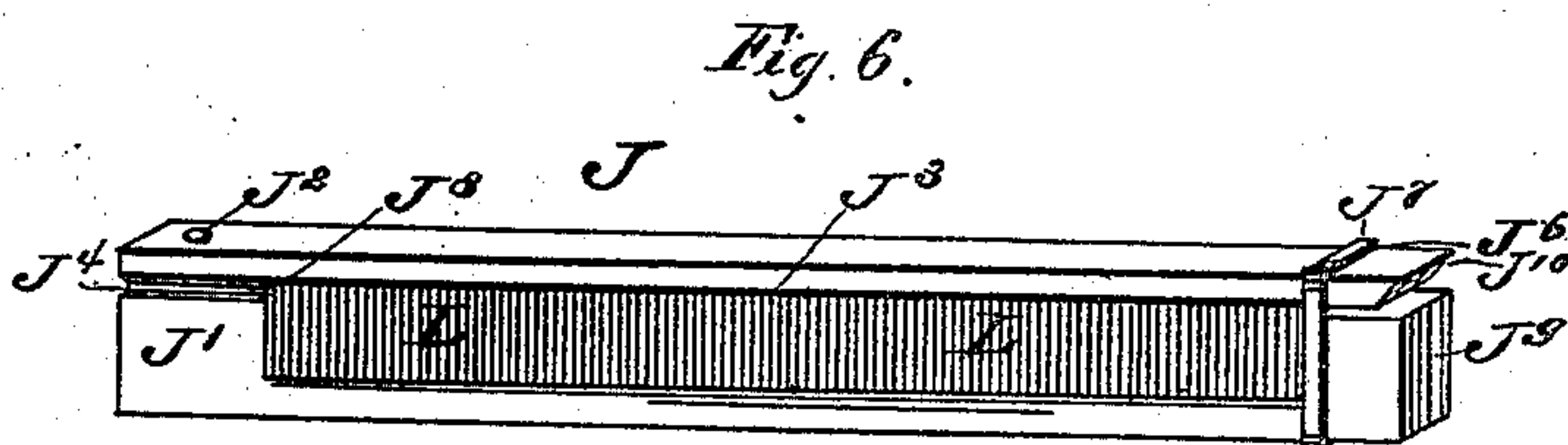
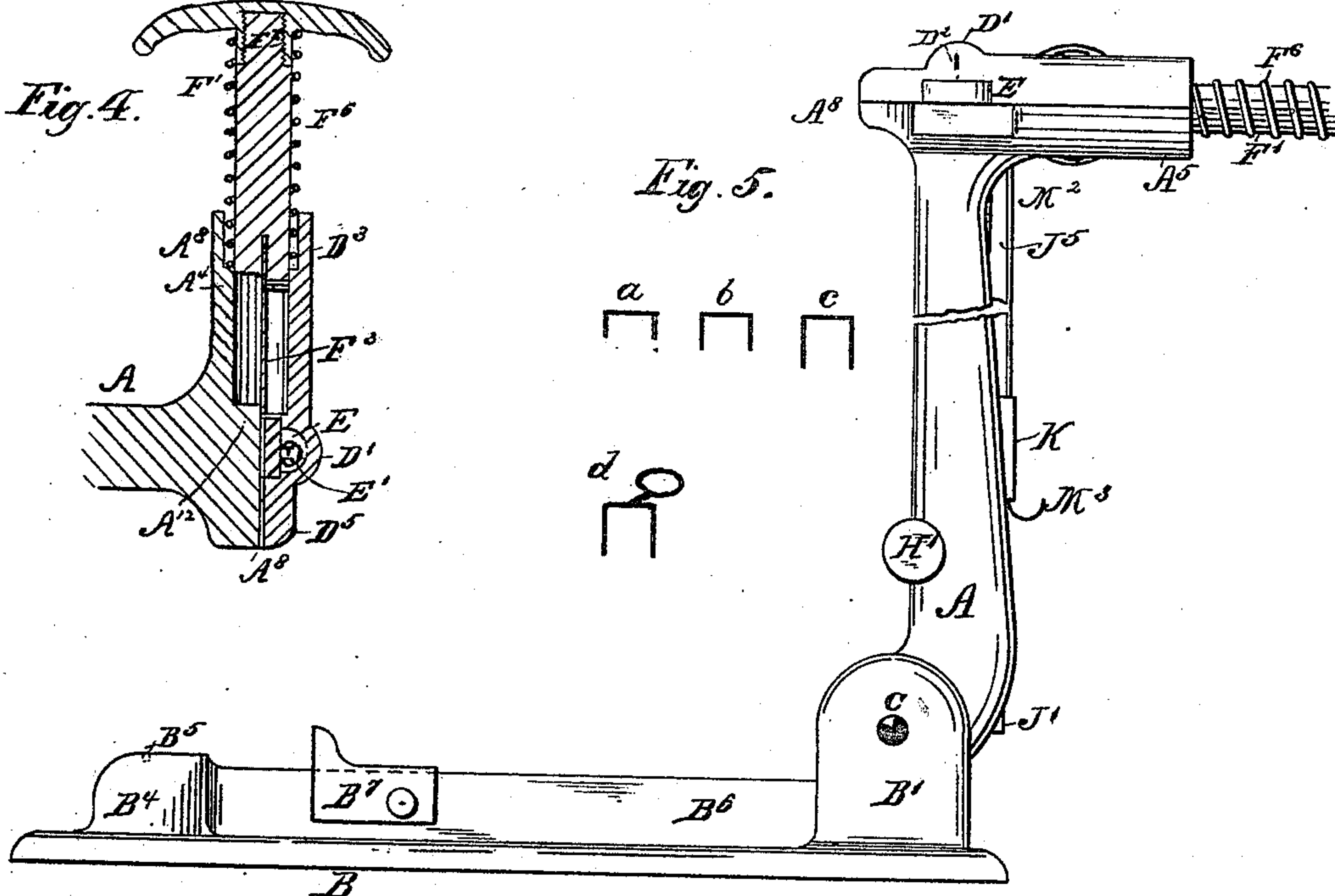
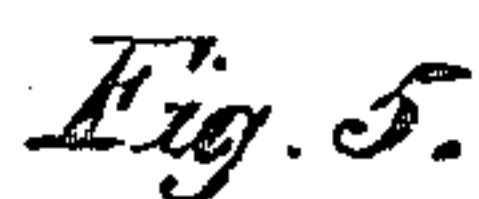
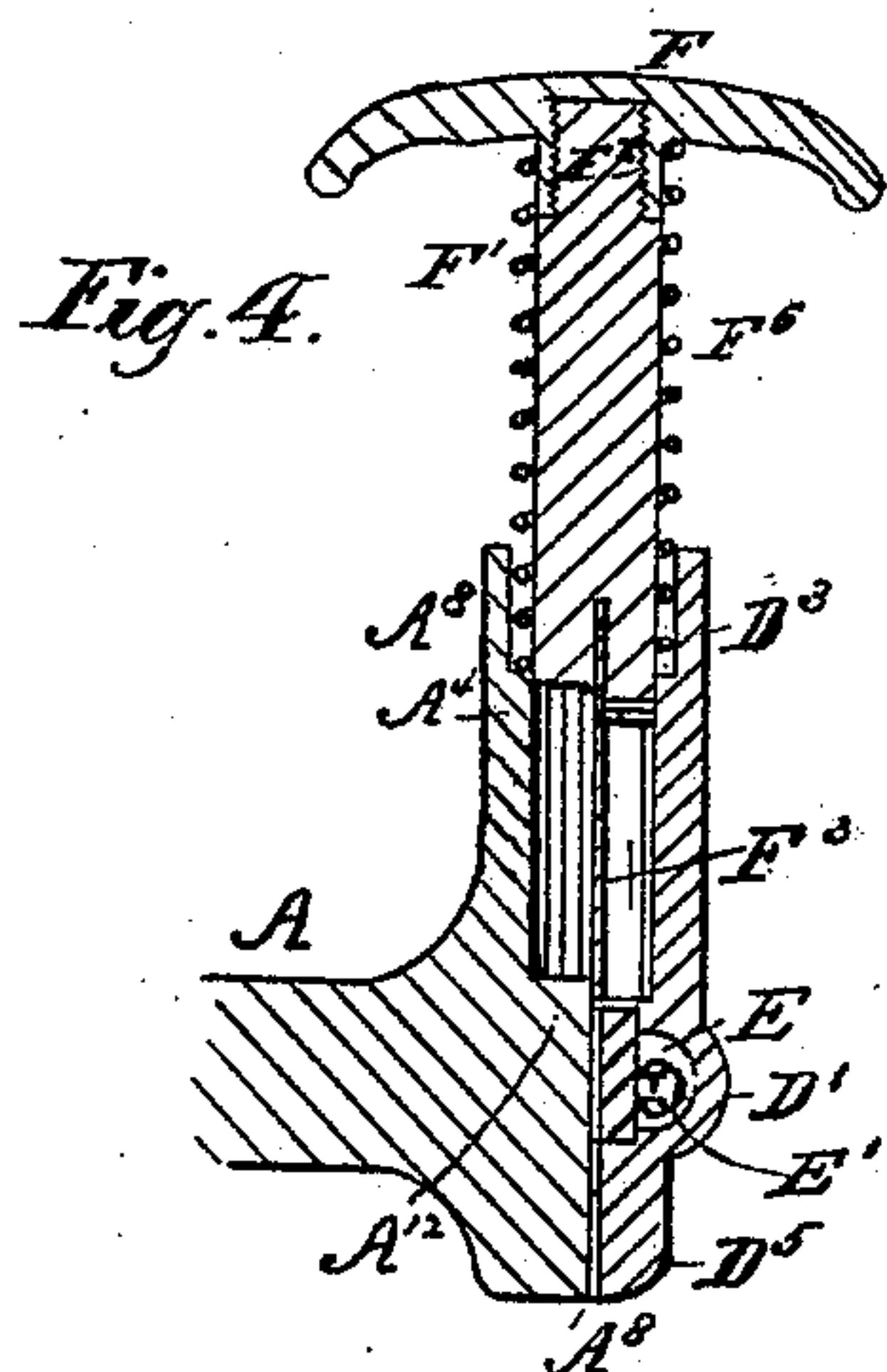
2 Sheets—Sheet 2.

I. W. HEYSINGER.

MACHINE FOR INSERTING METALLIC STAPLES IN PAPER, &c.

No. 349,093.

Patented Sept. 14, 1886.



WITNESSES:

Jas. Moran
F. H. Dixon

INVENTOR

INVENTOR
Isaac W. Olesinger.

UNITED STATES PATENT OFFICE.

ISAAC W. HEYSINGER, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR INSERTING METALLIC STAPLES IN PAPER, &c.

SPECIFICATION forming part of Letters Patent No. 349,093, dated September 14, 1886.

Application filed February 25, 1886. Serial No. 193,131. (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 Machines for Inserting Metallic Staples in Papers, &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 horizontal sectional view through the staple-driver and its coacting parts. Fig. 2 is a front view taken along the dotted line *yy* of Fig. 1. Fig. 3 is a side view from the side occupied by the staple-feeding bar. Fig. 3^a shows different equivalent forms of the follower which moves the staples along the bar. Fig. 4 is a vertical sectional view along the dotted line *xx* of Fig. 1. Fig. 5 is a side view of the machine, from the side opposite that shown in Fig. 3, and shows the arm raised. Fig. 6 shows the staple-bar, which I furnish with the machine, supplied with staples and ready for use. Fig. 7 and Fig. 7^a show different but practically equivalent forms of the clamp used to hold the staple-feeding bar in place; and Fig. 8 is an enlarged view of the end of the staple-bar and the parts of the machine to which it is related in place.

The lettering in all the figures is uniform.

My invention consists, first, in the construction of a self-feeding staple-driving machine either for hand or foot or power use, in which the staples are delivered into the machine, from a longitudinal staple-feeding bar carrying a series of staples, which are delivered into the machine not directly under the plunger or driver thereof, but alongside the vertical axis of the same, and thence carried laterally under the plunger by a transversely-reciprocating head block or carrier, actuated either independently of or in connection with the motion of the plunger or driver, so that the staples will not jam against each other in the staple-guiding channel of the driver from any accidental or incomplete movement of the plunger, as is the case when the staples are fed from a feed-bar immediately under the plunger; secondly, in combining with a staple inserting and clinching machine having a vibrating arm carrying staple-driving mechanism

at its free end, operating over a clinching-anvil provided with a clincher, and having a base to which the said driver-arm is attached, so that the latter may be raised to have staples inserted at the open end of the staple-guiding channel thereof of various sizes, a self-feeding device consisting of a staple-carrying bar supplied with a series of staples pressed forward into the machine external to the line upon which the plunger operates, and having a transversely-reciprocating head block or carrier constructed to carry the staples singly across the face of the machine and under the plunger, and adapted to be used either as a self-feeding or a single-feed machine, may be desired; thirdly, in the use, in a self-feeding staple-driving machine, of a longitudinal staple-carrying bar consisting of a body upon which the corners of the staples rest, lying against each other, and having their legs extending down along the sides thereof, and provided with a tongue or flap extending along the length of said bar, attached at one end and having the other free, so that the staples may be fed directly into the machine by a follower traveling along the said bar behind the staples, the flap or tongue acting as a guide for the staples while being fed into the machine singly, and as a protection to the staples strung upon the bar during transportation thereof, or when not required for use.

I do not, however, claim in this application the detachable or detached staple-holding bar or stick of wood or metal described and shown herein, except as a part of the staple-driving combination in which it is used, as the said staple-holding stick forms the subject of a separate application dated April 17, 1886, Serial No. 199,176, which is now pending in the United States Patent Office, and in which it is fully shown and claimed as an article of manufacture for all the various purposes for which it may be adapted.

Referring to the drawings, Figure 1 shows in horizontal section the staple-driving machine as adapted for use as a hand-tool upon a desk or table, and operated by a blow upon a knob, or, if preferred, pressure upon a lever attached to the plunger. B is a metallic base having posts B' B' raised at one end thereof, between which is pivoted the end of a vibrat-

ing arm, A, which carries at its free end the staple-driving mechanism, and rests by its own weight upon the paper or other material to be stapled. The base B is provided at its forward end (see Figs. 3 and 5) with a raised clinching-anvil, B¹, which contains a clinching-groove, B², upon its upper surface, which may be of any of the forms in use for like purposes. I show the front of this anvil sloped off, so that papers may be pushed under the driver, if desired, without raising the same by hand. When the arm A is raised, staples like a, b, or c, or suspension-ring staples, like d, Fig. 5, may be inserted in the open end of the staple-guiding channel A³, and when the arm is depressed and the plunger forced down they will be driven through any papers interposed between the driver and clincher, and the legs bent inward or clinched upon the grooved face of the anvil B¹. B⁶ is a stiffening-rib on the base, and B⁷ a sliding guide to regulate the distance from the margin of the papers at which the staples are to be driven.

Referring to Fig. 2, A⁴ is the driver-head of the swinging arm A, to the front face of which is attached, by screws A⁵ A⁶ A⁷ A⁸, a front plate, D, (see Fig. 1,) which holds the parts in place and is suitably recessed for the purpose. F¹ is a staple driver or plunger, supported by the coiled spring F², and reciprocating vertically in a channel in the head, as shown. It is provided at its upper end with a large rounded hand-knob, F; or a lever may be used instead, or in power machines a rotating cam, so that by pressure upon the head of the plunger the same will be forcibly driven down. F³ is a blade forming a downward extension from the bottom of the plunger F¹, and it rests above the crown of a staple when in position for driving, which said staple is driven downward through a narrow staple-guiding channel, A³, as the plunger descends. When a clincher is used, the legs are clinched upon the grooved anvil B¹ beneath. E is a transversely-reciprocating head-block or carrier, which traverses laterally across the line of vertical motion of the plunger F¹ and the driving-blade F³, and a groove, E², is made in the rear side of the carrier E, which permits the vertical passage of the blade F³, as shown in Fig. 1; or the carrier may not extend entirely across the face of the machine, but may be a transversely-reciprocating blade approaching the line of descent of the plunger, and then receding therefrom laterally, so that a staple lying in front of the said transverse blade would be carried under the plunger by its motion toward the same; but I prefer to use the grooved head-block E, as it is more certain of operation, and a staple in the groove E² would be carried to and fro as the head-block was reciprocated, so that a fresh staple could not enter the groove E² until the preceding one had been driven out by the plunger F³. The groove E² conforms to the size and shape of a staple lying flatwise therein, the legs pointing downward. If staples with slightly flaring

legs are shown, as in Fig. 7^a, the groove will be slightly wider below; if staples with straight legs, as in Fig. 7, the sides will be vertical. When pushed to the left, the motion of the head-block E will be arrested by the stop E³, and in its return the head-block will be stopped by the lug or stop E⁴. Within these limits it is free to travel to the left, and is brought up sharply to the right by a spring, C, which may be of any desired form or construction, though I prefer to use a simple coiled extension-spring, as shown in Fig. 1. When pushed to the left, the groove E² will occupy the space marked by a dotted staple, L. This staple, Fig. 2, lies behind the head-block, and is the terminal staple of a series strung or otherwise arranged upon a longitudinal staple-holding bar extending back from the dotted staple of Fig. 2 in the manner shown at J in Fig. 1. This series of staples lying flatwise against each other is carried forward under tension by a spring-follower, K, (see Fig. 3,) so that the staples, which are prevented from lateral escape by the flap or tongue J⁵, are pressed forward along the slot J⁴, the terminal staple abutting against the smooth rear face of the head-block or carrier E. If the groove E² is empty and the head-block E be pushed to the left to its full extent, it will slide along the front end of the series of staples until the groove E² comes opposite the staple-bar J, when a single staple will be projected into the groove E² and the series of staples L will move up one space along the slot J⁴. When pressure is removed from the head of the carrier E³, the spring C will suddenly return the carrier to its place, and the groove E², carrying the staple, the latter will be placed directly under the driving-blade F³. A blow upon the top of the plunger F will drive the blade F³ down through the groove E² and the staple-guiding channel A³, carrying the staple before it, and drive the legs of the staple into any suitable material beneath.

It will be seen that the plunger cannot descend unless the carrier is in place, with its groove E² beneath the same, nor can two or more staples be carried under the blade F³ at one time, as the staple will remain in the groove E² if it be again reciprocated, and block the entrance to any succeeding staple until the former one be driven out by the descent of the plunger.

As the staple has sometimes a tendency to drop a little in the groove E² when carried over the staple-guiding channel A³, unless somewhat carefully fitted, so that the legs are likely to be caught and the staple injured by being carried back accidentally a second time in the carrier, I usually make the carrier E of hardened steel and magnetize it, or provide it with a suitable holding attachment, so that a staple lying in the groove E² will be attracted and adhere to the bottom of the same without tendency to slip or drop. I also sometimes, instead of the carrier, magnetize the driving-blade F³, so that the staple will slide along its

under surface in contact therewith; but I prefer the former, and if the parts are carefully fitted the staple will be held mechanically and no magnetization will be necessary.

5 As often as the carrier is reciprocated and the staple driven out a new one may be taken up and the operation go on continuously until the staples upon the bar J are exhausted, when the bar is removed and a fresh one filled with
10 staples is put in place. I make these bars to hold from one hundred to five hundred or more staples, and usually provide them of wood or other cheap material, and furnish them already filled for use in the machine, and they may be
15 thrown aside when empty or refilled at pleasure.

While the bar J is in use, or at any time it may be desired to use staples of odd sizes, such as are not at the time upon the feed-bar, or to use a suspension-ring staple, such as is
20 shown at *d*, Fig. 5, in such case the carrier E is merely left in place, instead of being reciprocated, and the arm A being raised, as shown in Fig. 5, the staples are inserted
25 singly at the open end of the staple-guiding channel A⁸, crown first, and when the bar is brought down the staple will be driven and clinched, as in ordinary single-feed staple-in-
30 serting machines. To accommodate the laterally-extended loop of a suspension-ring staple, as shown at *d*, Fig. 5, the rear side of the staple-guiding channel A⁸ is recessed at its
middle part, with a notch extending through the same, as shown at A¹⁰, Fig. 2.

35 Instead of operating the carrier E by independently working it laterally to the left, I sometimes use a right-angled lever to move the same to the left by a vertical motion of the arm, the lower end of which is pivoted to
40 the sliding carrier, and the angle pivoted to the frame of the driver D; and, in power-machines, for instance, I sometimes attach this lever to the plunger, so that the upward motion of the plunger may operate the carrier,
45 or I work the carrier and the plunger from one or more cams by the same belt or gearing. For a simple cheap hand-machine I prefer the form shown in Fig. 2.

The face-plate D is screwed onto the face of
50 A⁵, and holds the plunger, the springs, and the carrier in place, forming a case for the same. The line of parting of the castings is shown in Fig. 4. It will be seen that the front of A⁵ is substantially a flat surface, the grooves
55 and channels for the most part being formed in the cap D. The hollow roll or bead D' contains the spring C, which may, however, lie outside, if desired. The head-block E reciprocates in grooves somewhat wider than the
60 grooved bead D'. At D² is a post extending down from D' nearly to the head-block E, and at E' is a screw or post raised upon the front side of E. A coiled spring, C, stretched from one to the other, serves to return the carrier
65 to its place and hold it there. The vertical groove D³ crosses the groove D', and, in conjunction with an opposite groove on A⁵, car-

ries the plunger F'. At the lower part of D the staple-guiding channel A⁸ is also preferably
70 formed in the cap D, through which, as well as through E², the plunger-blade F³ descends in driving the staple. I modify my machine to drive shoe-nails, tacks, glaziers' points, &c., without departing from the principles of my
75 invention, as will be obvious to any one skilled in the art to which it pertains.

The construction of the staple bar or rod J, to which, however, I make no claim in this application, except as a part of my generic combination, is clearly shown in Fig. 6, and in
80 end view in Figs. 7 and 7^a. It consists of a long rod of wood or metal, substantially of the sectional form shown, and is provided with a tongue or flap, J⁵, extending along the top of the same, attached at one end to leave an
85 open groove, J³, rather wider than the thickness of the wire of which the staples are made, and which staples I usually make of Bessemer or other steel or iron wire, and having the opposite end of the tongue or flap J⁵ free, so that
90 the staples may be pushed out of the slot J³ by a follower moving behind, the flap J⁵ acting as a guide to prevent their being pushed off at the side, and directing them along the slot and out from the open end of the same. I usually
95 prefer to make these staple-bars of wooden strips of a proper size and length, sawing the slot J³ into the same from one end nearly to the other with a band-saw or other smooth
100 saw. The unsawed end I prefer to protect against splitting by a small nail, J². Having strung this bar full of staples, I secure them by tying a cord or elastic band over the end, as shown in Fig. 6 at J⁷, which securely holds
105 the flap down and keeps the staples in place. Instead of a cord or band, a small nail may be used; but I do not prefer it, as it roughens the delivery-space. These staple-bars, already
110 filled may be provided, at no perceptible advance in price, over staples in boxes, and they are all ready for use in the machine.

It will be seen (see Figs. 6 and 8) that the end of the flap J⁵ is beveled or provided with an offset, J¹⁰. While not absolutely essential, I prefer to use this to keep the slot J³ open
115 while the staples are being fed into the machine. Upon D is a beveled projection, D⁶, matched to J¹⁰, so that when the staple-bar is pushed into the machine the bevel J¹⁰ of the flap J⁵ will impinge against and rise upon the
120 bevel D⁶ of the machine, thus spreading the slot J³ and holding it open. Where the follower-spring is of considerable strength, this will usually suffice without these bevels or offsets. A filled bar, J, being ready to be in-
125 serted into the machine, the front end will be inserted, the band J⁷ having been removed or stripped back underneath the overhanging head A¹⁵ of the machine and over the socketed support A¹⁴, Fig. 8. The middle or rear part
130 of the bar J will be supported by the clamp A⁶ A⁷, attached to the arm A. Resting in place in the clamp, it is tightened up by the screw in Fig. 7^a or the spring-clamp in Fig. 7. The

front end of J is closely applied to the rear face of the carrier E. The spring-follower K, which is attached in the figures to one end of a clock or other spiral spring, M, turning upon a post, M', to which its inner coil is fastened, is drawn back and hooked over the end of the staple-bar J, the projections K' K' of the follower K, or a small removable pin in lieu thereof, as shown, (see Fig. 3^a), entering through the grooves J' J', made in the unsawed end of J, and traveling along the groove or slot J³, so as to push the staples along. The lower parts of the sides of K extend down alongside the rod J and embrace the legs of the staples L, so as to push them evenly along. At K³ the sides are shown extending in advance of the body of K, to pass into the machine and deliver the final staples of the series. The clamp A⁶ A⁷ may be anywhere along the length of the rod J, and I sometimes place it so as to bind at J' at the unsawed end of J.

While I prefer to feed from my staple-bar directly into the machine, I sometimes strip the staples from my bar, provided with its retaining-tongue or flap J³, onto a metal bar permanently fixed in the machine. The detachable bar, however, enables the mechanism to be examined from behind, should a staple catch, by merely detaching the bar J, instead of taking off the plate D, as would otherwise be requisite. Instead of the clock-spring M M', I sometimes use a simple coiled spring or an elastic band; but I prefer to use the form shown as being more sensitive and convenient.

When the clincher B³ is not required, as when a simple driver is used, I dispense with the base B and its parts and furnish the self-feeding driver, as above described, without a clincher, and with or without a handle, A. For making up boxes, upholstering furniture, wiring blinds, and for various other purposes my invention is thus extremely desirable.

Instead of having the carrier reciprocate in a right line transversely to the axis of the plunger, I sometimes construct it to move at various angles thereto, or upon the arc of a circle, and I otherwise variously modify my machine without departing from the principles of my invention as hereinabove set forth.

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

1. A staple-inserting machine consisting of a plunger-case, A¹ D, plunger or driver F' F'', and staple-guiding channel A⁸, in combination with a laterally-reciprocating carrier, E, moving transversely in the plunger-case A¹ D, and constructed to carry a staple transversely from a point outside the line of descent of the said plunger under the driving-blade thereof, substantially as and for the purposes described.

2. In combination with the plunger-case A¹ D of a staple-inserting machine, provided with a reciprocating plunger, F', staple-guiding channel A⁸, and transversely-reciprocating carrier E, the self-feeding staple-bar J, having

a series of staples strung thereupon, and constructed to deliver the said staples singly to the carrier E at a point outside the line of descent of the said plunger F', and the said carrier E, constructed to carry the said staples singly under the said plunger F', substantially as described.

3. In combination with the base B, having clincher B³, the swinging arm A, pivoted at its rear end to said base, and having at its front end a staple-driver consisting of plunger F', working vertically in a case, A¹ D, staple-guiding channel A⁸, and retracting-spring F'', together with the transversely-reciprocating head block or carrier E, and the self-feeding staple-holding bar J, the whole constructed to operate substantially as and for the purposes described.

4. In a staple-driving machine, in combination with the plunger-case A¹ D, the plunger F', and staple-guiding channel A⁸, the transversely-reciprocating head-block E, provided with the shallow staple-holding groove E², and the self-feeding staple-holding bar J, delivering a series of staples singly from the said bar J against the said head-block E and into the said groove E² thereof, substantially as described.

5. In a staple-driving machine having plunger-case A¹ D, plunger F', and staple holding and guiding channel A⁸, the reciprocating head block or carrier E, having a staple-holding groove, E², formed therein, the said carrier E or the groove E² thereof being provided with means to hold steel or iron staples thereto during the reciprocation thereof and until driven by the said plunger, substantially as described.

6. A self-feeding staple-driving machine having plunger-case A¹ D, plunger F', staple-guiding channel A⁸, spring M, and spring-follower K, in combination with the detachable self-feeding staple-holding bar J, removably clamped to the machine, and constructed to receive the follower K upon the same in rear of the series of staples with which the said bar J is loaded, and to deliver the said staples singly into the machine for driving the same as the preceding staples are driven, the said detachable bar being removable to open the machine for examination, and the said bar J being replaceable, when empty, with another and a fully-loaded like staple-holding bar, substantially as described.

7. In combination with a self-feeding staple-driver having a plunger-case, A¹ D, a plunger working vertically therein, and a staple-guiding channel, A⁸, a socketed opening, A¹⁰ A¹¹, to admit the head of a staple-feeding bar, J, into the machine, and having a slope or offset, D⁶, together with a staple-feeding bar, having a longitudinal body, J, staple holding and guiding slot J³, and protecting-flap J³, said flap J³ beveled at J¹⁰, for engagement against D⁶, to hold the said flap in place and prevent closure of the said slot J³, substantially as described.

5 8. In a self-feeding staple-driver, in combination with the transversely-reciprocating carrier E, the retracting-spring C, and suitable staple-inserting mechanism, substantially as described.

10 9. In combination with the arm A, staple-driver A⁴ D F F' A⁸, and detachable self-feeding staple-bar J, the clamping and releasing mechanism H A⁶ A⁷, or its equivalent, attached to said arm A, and constructed to set and detachably secure the said staple-bar J for use in the machine, substantially as described.

15 10. The combined self-feed and single-feed staple-driving machine, consisting of a clinching-base having pivoted thereto at one end a vibrating driver-arm adapted to be raised in an upright position to receive staples fed into the open end of the delivery-slot of a staple-driver constructed upon the free end of said
20 arm singly, and having in connection with said driver a transversely-reciprocating carrier adapted to take up staples singly from a self-feeding staple-bar outside the line of descent of

the said driver and carry them under the said driver by the reciprocation thereof, the whole 25 constructed to be used as a self-feeding machine when the carrier is in use and as a single-feed machine when the carrier is not reciprocated, substantially as described.

11. In a staple-driving machine having a 30 base, B, provided with a clinching-anvil, B⁴, and a grooved clincher, B⁵, and a staple-driver resting upon said clinching-groove, having a reciprocating plunger, F', and a staple-guiding channel, A⁸, and pivoted to the said base 35 B, the said anvil B⁴ sloped or beveled off upon its front side and having the driver-case overhanging the said slope, so that papers may be inserted by presenting them against the slope of B⁴, and thus raising the driver by their 40 pressure, substantially as described.

ISAAC W. HEYSINGER.

Witnesses:

M. B. FENNINGER,
J. LOREN HEYSINGER.