(No Model.) 3 Sheets—Sheet 1.

N. P. PETERSON.

BLIND STAPLING MACHINE.

No. 335,304. Patented Feb. 2, 1886.

Fig. 1.

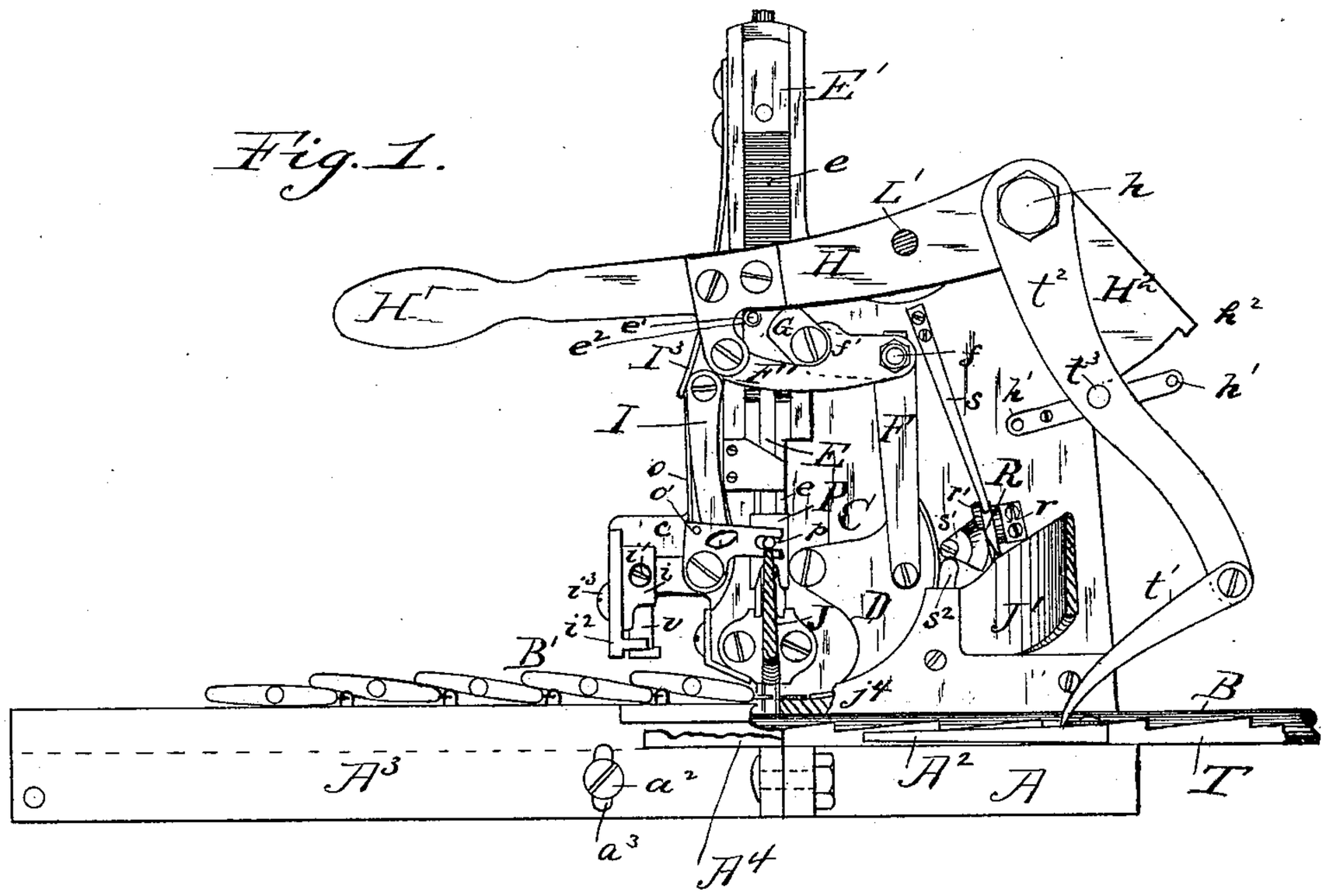
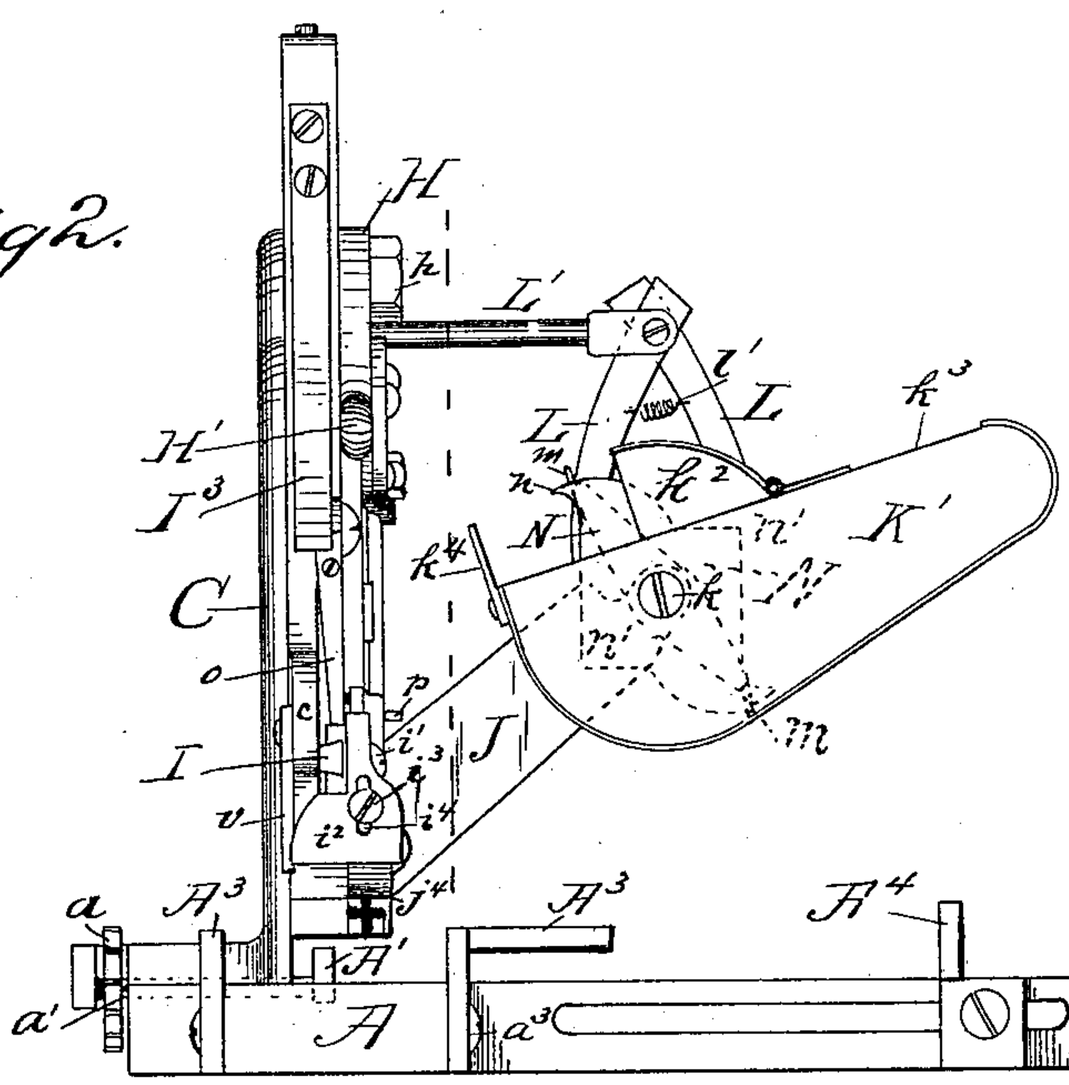


Fig 2.



Witnesses
Leo E. Curtis.
Ephraim Banning.

Inventor
Nicholas P. Peterson
By Taylor E. Brown
his Attorney.

(No Model.) 3 Sheets—Sheet 2.

N. P. PETERSON.

BLIND STAPLING MACHINE.

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Fig 3.

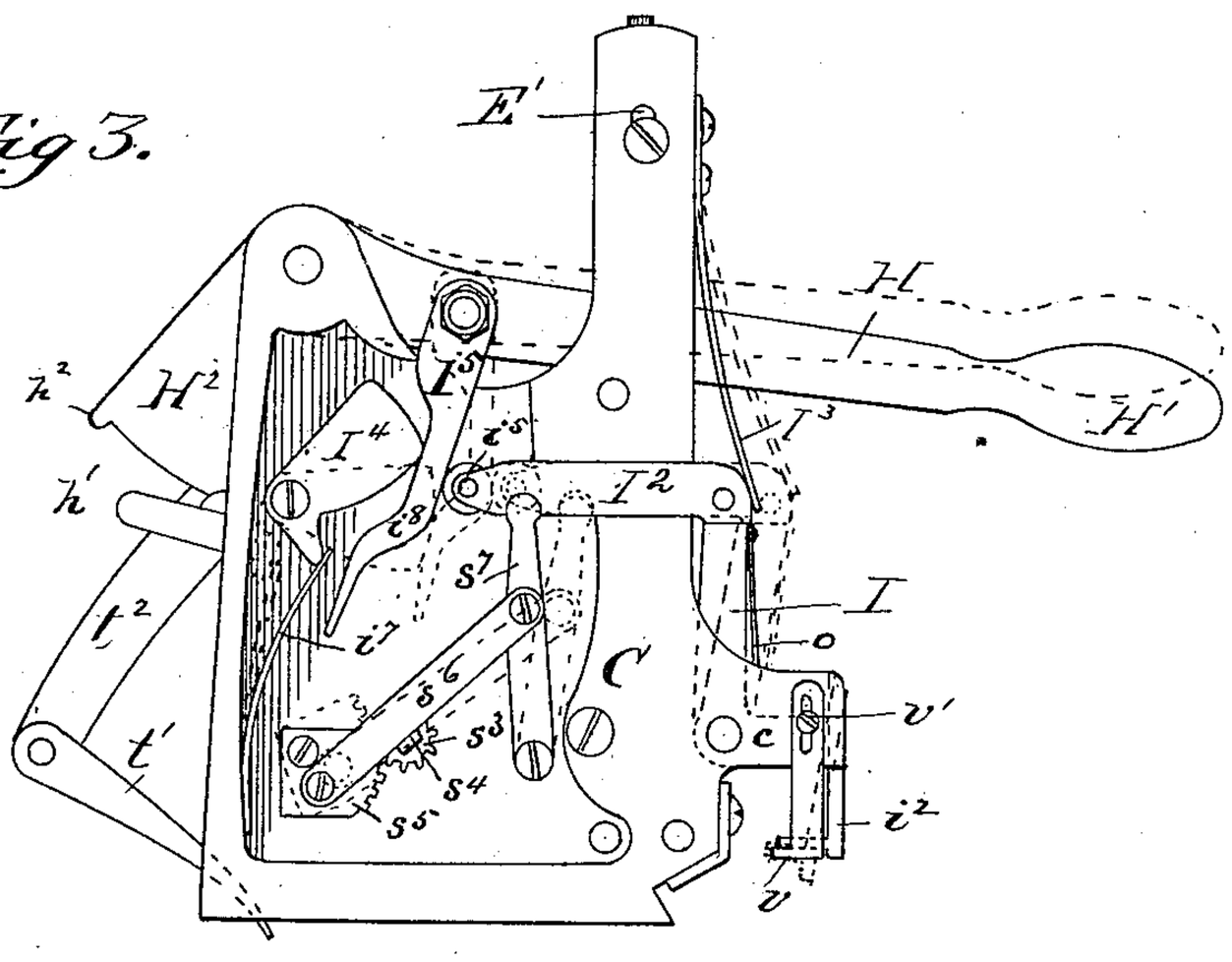


Fig 4.

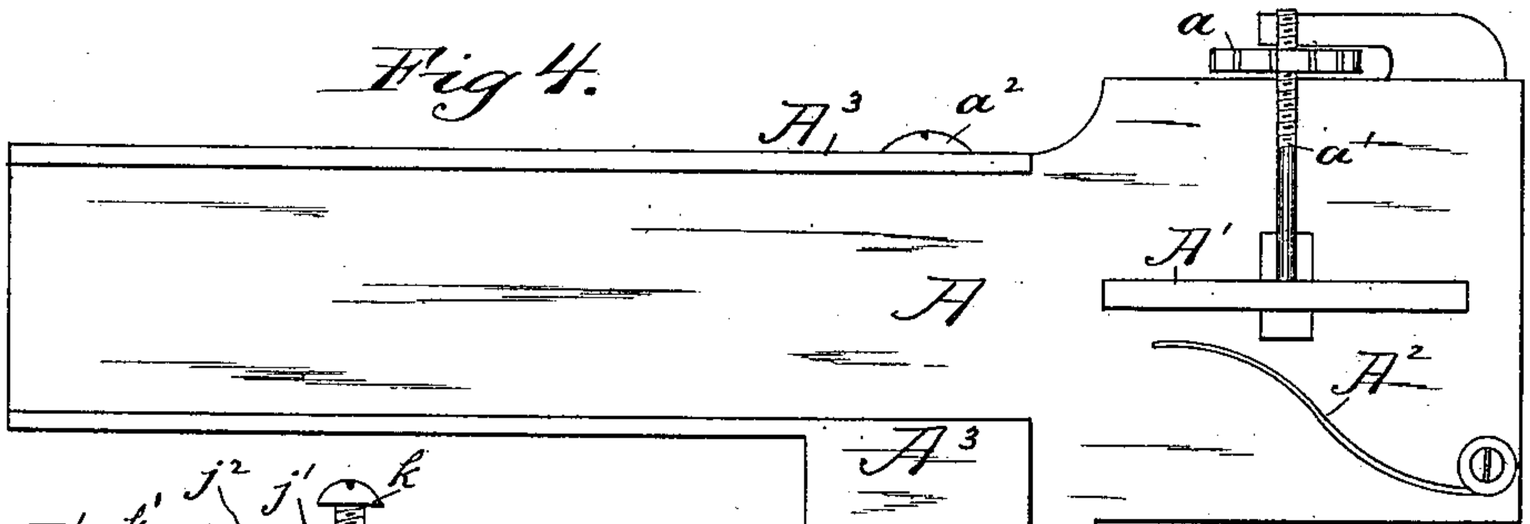


Fig 5.

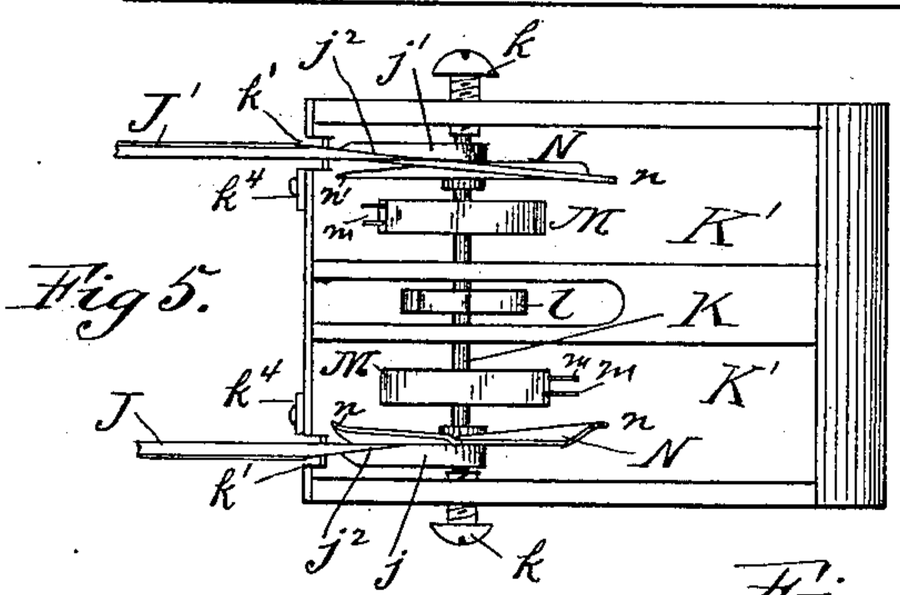


Fig 6.

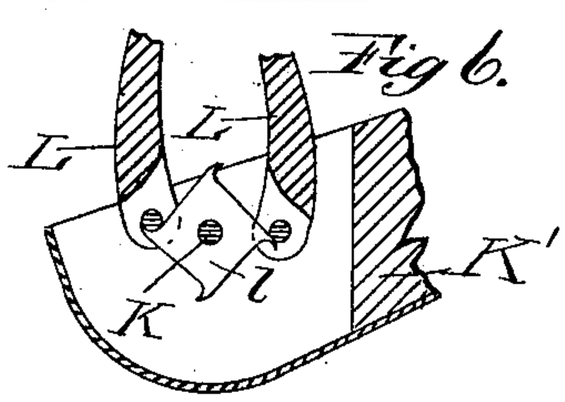
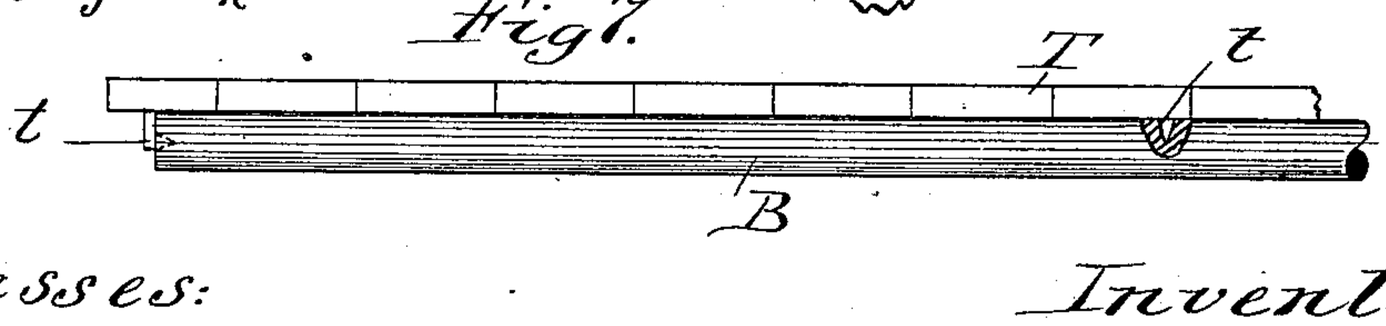


Fig 7.



Witnesses:
Lew. E. Curtis
Ephraim Banning

Inventor
Nicholas P. Peterson
By Taylor & Brown
his Attorneys:

(No Model.) 3 Sheets—Sheet 3.

N. P. PETERSON.

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Fig 8.

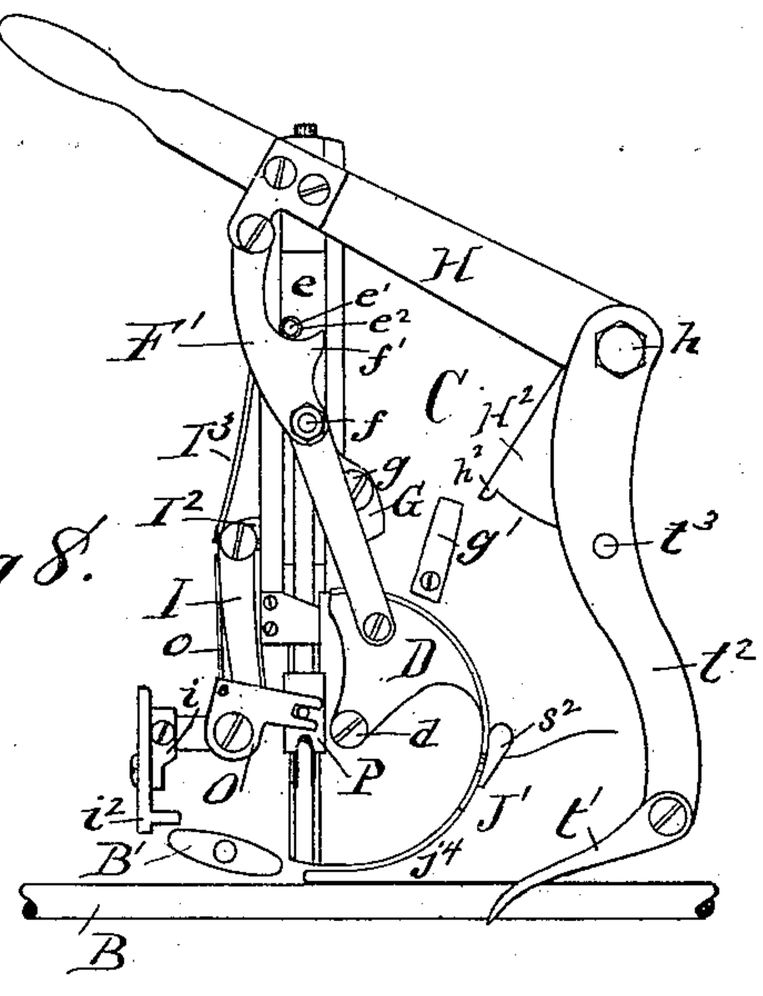


Fig 9.

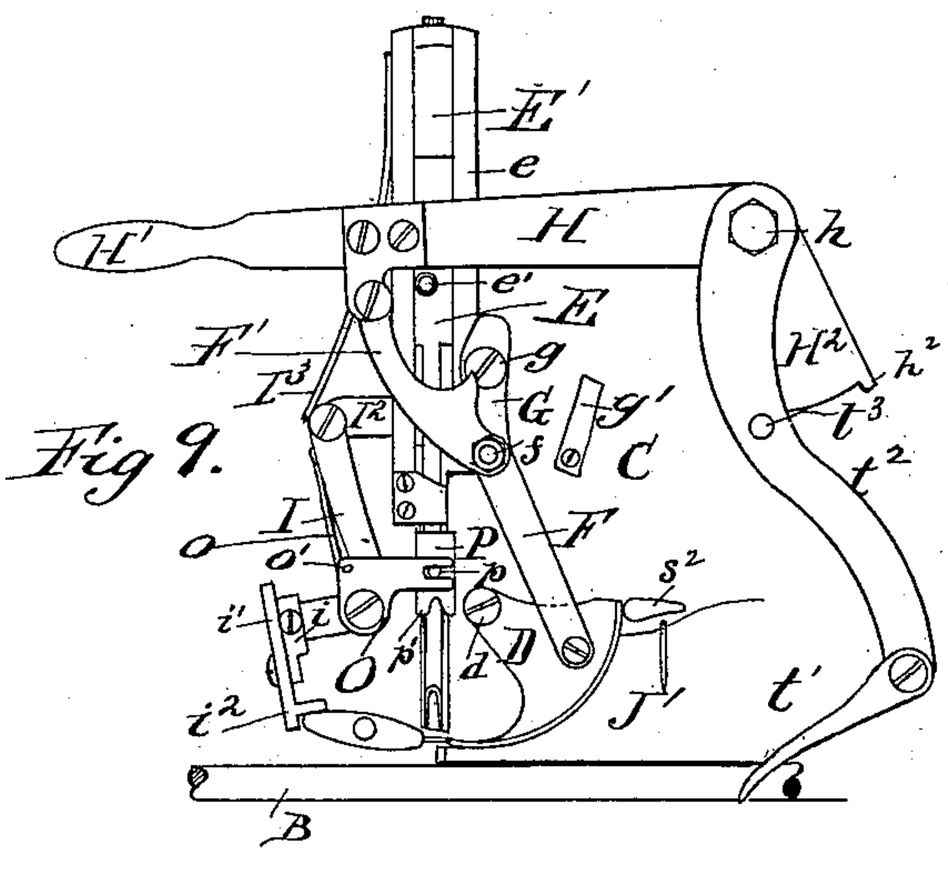


Fig 10.

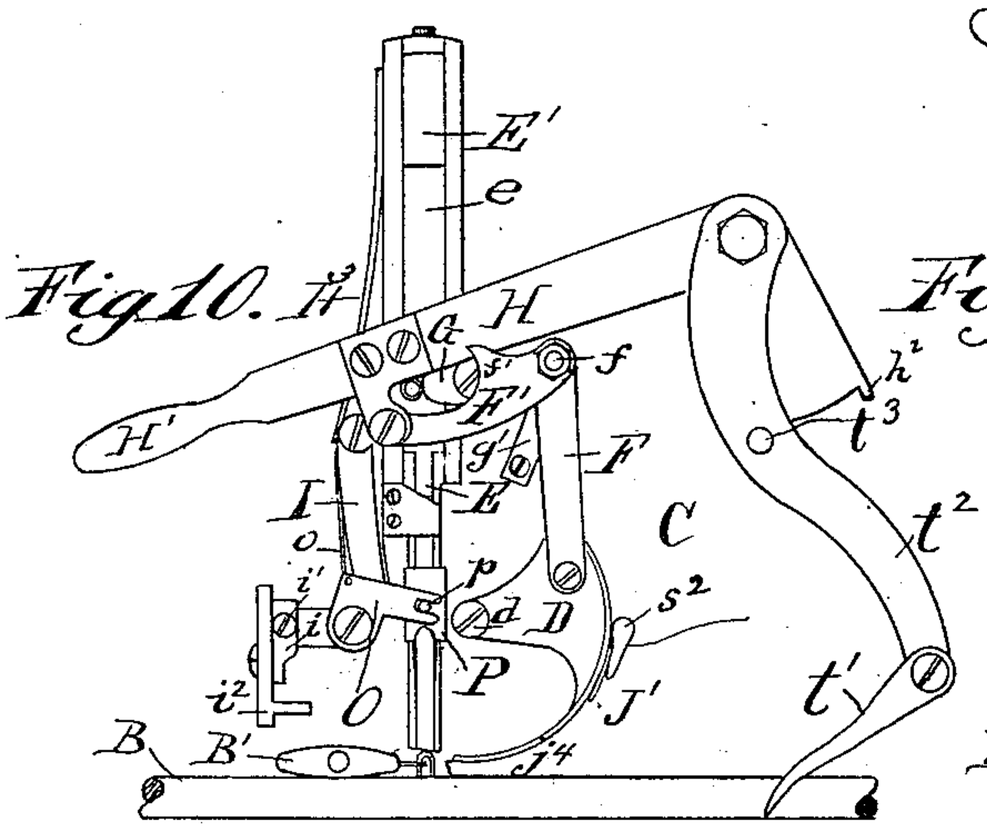


Fig 11.

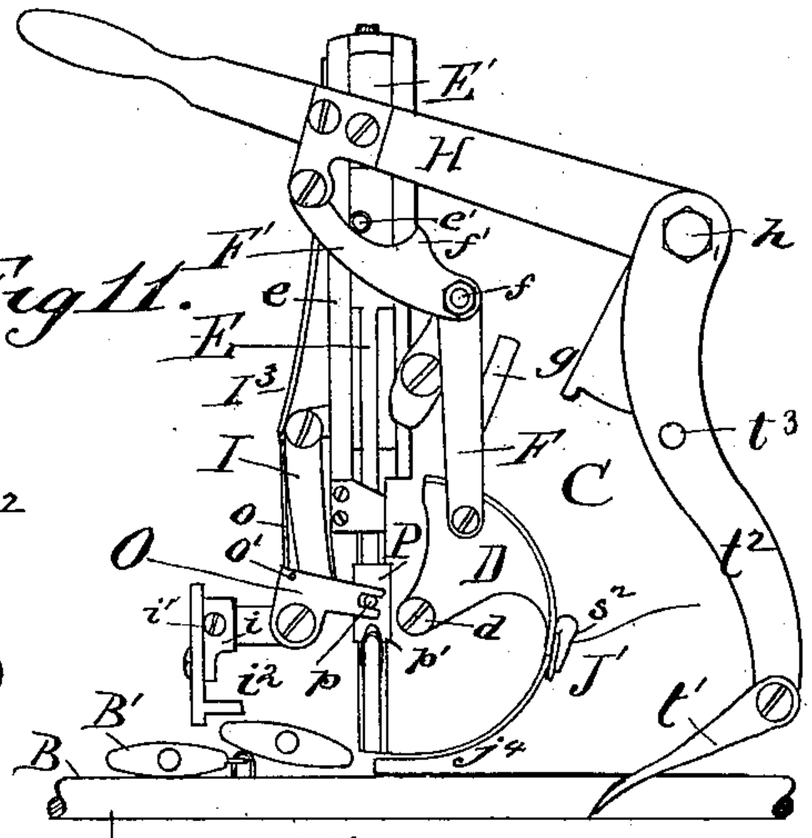


Fig 12.

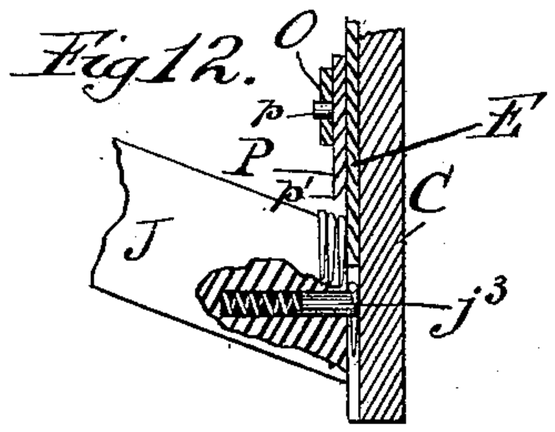


Fig 13.

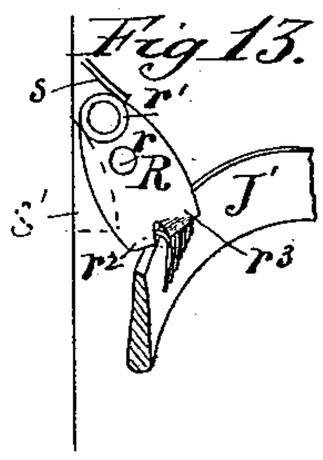


Fig 14.

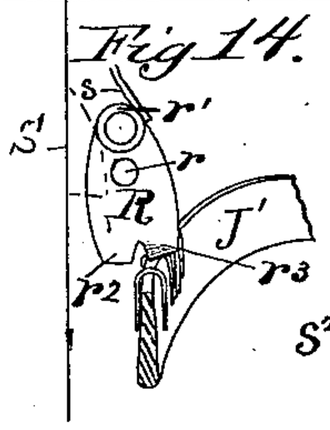
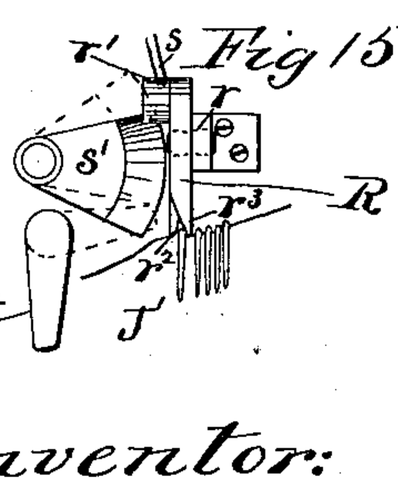


Fig 15.



Witnesses:
Lew. E. Curtis.
Jno. G. Gates.

Inventor:
Nicholas P. Peterson
By Taylor E. Brown
his Attorney.

UNITED STATES PATENT OFFICE.

NICHOLAS P. PETERSON, OF CHICAGO, ILLINOIS.

BLIND-STAPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,304, dated February 2, 1886.

Application filed January 21, 1885. Serial No. 153,565. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS P. PETERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Blind-Stapling Machines, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use it.

In that class of window and door blinds wherein movable slats are used it is customary to secure all the slats, or all the slats in one section, together to a rod, whereby they are opened and closed. The ordinary and, perhaps, the best method of fastening these slats to the rod is by using small staples; and it is the object of my invention to produce a machine capable of putting the staples in the slats and the rods and at the same time secure them together.

To this end my invention consists in the novel devices and combination of devices herein shown and described, and pointed out in the claims.

In my machine I employ two driving-arms, the one to drive a staple horizontally into the edge of the slat and the other to drive a staple vertically into the rod, the slat-staple being in such a position that one point or end of the rod-staple will pass through the eye of the slat-staple, thus forming a hinge-joint and securing the slat to the rod. The staples are fed from hoppers over inclined tracks to automatic feeding devices, which present one staple at a time to each driver. The staples are taken from the hoppers and placed on the inclined tracks by hooked disks mounted on a shaft passing through the hoppers. Being small, the staples are liable to become entangled and locked together in the hoppers, and in order to prevent this and insure the perfect working of the hooked disks I employ stirring-arms mounted on this same shaft, which arms, having prongs or fingers on their ends, engage the mass of staples and stir them about so that the hooked disks can readily pick up a staple and place it on its track. The shaft is operated by a pawl and ratchet from the main lever, which works the driving-arms. For convenience, I place my hoppers side by side and mount the ratchet on the shaft between the hoppers. The rods are fed to the machine longitudinally and are moved forward by means hereinafter described. The slats are fed by the attendant to the machine by placing them transversely to and above the rods. A pivoted clamping device holds the slats in position while the staple is being driven into its edge, and then releases the slat. It is raised in time to allow the rod to be moved forward into position for the next staple. Proper gages and guides are arranged to center both the rods and the slats and to insure uniformity.

The parts are made adjustable, so as to adapt the machine to slats and rods of different sizes.

My invention will be more fully understood by reference to the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts.

In said drawings Figure 1 is a side view of a machine embodying my invention, partially in section to more clearly show the parts. Fig. 2 is an end view of the same. Fig. 3 is an elevation on the opposite side to that shown in Fig. 1, the back plate being removed. Fig. 4 is a plan view of the base or table. Fig. 5 is a plan view of the hoppers without the hood. Fig. 6 is a partial vertical section of the same. Fig. 7 shows the ratchet for feeding the rods. Figs. 8, 9, 10, and 11 are detail side views illustrating the operation of the machine. Fig. 12 is a vertical sectional view of the feeding device for feeding the rod-staples; and Figs. 13, 14, and 15 are detail views showing the feeding device for feeding the slat-staples.

The letter A represents the base or table provided with an adjustable guide, A′, against which the rods B are placed. This guide A′ is adjusted to and from the work in a transverse slot in the table A, so as to center the rod, by means of the adjusting-nut *a* and the screw *a′*, secured to the guide A′. The spring A^2 keeps the rod against the guide A′. Side pieces, A^3, adjustable vertically by means of the screws a^2 and slots a^3, serve as a table for

the slat B′ to be laid upon, while the adjustable gage a^4, against which the end of the slat is placed, insures uniformity in stapling the slat.

Upon the frame C, secured to the table A, are mounted the driving-arms and the mechanism for operating them. The segmental driver D, which drives the staples into the slats B′, is pivoted at *d* to the frame, and operated from the lever H by means of a toggle-joint, the link F whereof is pivoted to the driver D, and the link F′ is pivoted to a lug on the lever H. The arm E, which drives the staples into the rods, is mounted in vertical slides or guideways *e* on the frame C, and is provided at its upper end with a pin, *e′*, carrying a friction-roller, e^2, which engages with one edge of the link F′ to raise the driving-arm, and on which the lower edge of the lever H rests when forcing said arm down to drive the staple. The links F and F′ are pivoted at the knee or joint by a pin, *f*, to a cam-lever, G, which is pivoted at *g* to the frame C. The link F′ has a cam or hook, *f′*, to more readily raise the driving-arm. In the top of the slide in which the driver E travels I place a spring cushion or stop, E′, to limit the upward movement of the driving-arm E, and to cause the toggle to pass the center, as hereinafter to be explained.

Pivoted to a lug, *c*, of the frame is a bell-crank lever, I, to the horizontal arm of which is secured the clamping device by which the slat is held while being stapled. I prefer to make this clamping device of two parts, *i* and i^2, securing the part *i* to the arm of the lever by a dovetail joint, as shown in Fig. 2, and adjusting it by means of the screw *i′*. The clamping-plate proper, i^2, is adjustably secured to the part *i* by the screw i^3 and slot i^4. By means of these adjustments slats of different sizes may be accommodated.

In Fig. 3 the lever I is shown pivoted to one end of a horizontally-moving rod or bar, I^2, on the other end of which is a friction-roller, i^5. A spring, I^3, presses against the bar I^2, and tends to keep it in the position shown in full lines therein. A stop or bearing, I^4, pivoted to the frame at i^6, has pressure exerted on it by the spring i^7, which tends to keep it in the position shown in dotted lines in said figure. Motion is communicated to the clamping-plate i^2 from the lever H by the wedge or cam link I^5, pivoted at its upper end to the lever H, and which passes down between the friction-roller i^5 and the bearing I^4. When the lever is raised to the full height, (see Fig. 8,) the cam or wedge link I^5 is also raised, so that only the tip or thin portion rests between the roller i^5 and the stop I^4, the springs i^7 and I^3 keeping these parts together, as shown. When the lever H is lowered to the position shown in Fig. 9 and in dotted lines in Fig. 3, the link I^5 is forced between them. As shown in the latter figure, the cam-surface i^8 of the link forces the roller i^5 and the bar I^2 outward, thereby operating the clamping device and clamping the slat. A further downward movement of the lever H allows the rounded edge or corner of the bearing I^4 to move up into the position shown in full lines in Fig. 3, when the springs I^3 force the bar I^2 back, thereby releasing the slat.

The inclined tracks J J′, over which the staples are fed to the driving-arms, are secured rigidly at one end to the frame C, and are provided at their other and higher ends with bearings *j j′* for the support of the shaft K, which passes through them and projects on either side thereof. The hopper or hoppers K′ are hung from this shaft by means of the adjustable bearings *k k*, a slot or opening, *k′*, being made in the hopper end to allow the tracks to enter the hopper. The shaft K is revolved from the main lever H by the double pawl L, secured to the lever H by the stud or bolt L′, which pawl engages with the ratchet *l*, mounted rigidly on the shaft. A spring, *l′*, holds the arms of the pawl together and insures their proper working. Stirring-arms M, having prongs or fingers *m*, are mounted on the shaft K, as are also the feeding-disks N. These disks are provided with hooks *n*, to engage with a staple in the hopper and carry it upward and onto its track. The diagonally-opposite portions or points, *n′*, of the disk N are made thin, the disk tapering in thickness from the hooks *n* to the points *n′*. The hooks and points are bent or shaped so that they travel or move in different vertical planes from each other, so that when the disks are mounted on the shaft opposite the tracks J J′ the hooks *n* will not touch or be near the tapered ends of the tracks, while the points *n′* will just touch them in passing. The hook *n* having picked up a staple from the bottom of the hopper K′ carries it upward as the disk revolves, and as the hook approaches a point nearly vertically over the center of the shaft the staple will slip or slide down the tapered portion of the disk over the points *n′* and j^2 onto the tracks J J′ to the feeding devices. A hinged hood, k^2, partially covers the disks and stirring-arms, and prevents the staples from being thrown out of the hopper. The staples are fed into the hopper through the opening k^3, while gates k^4 are provided to prevent the staples from sliding onto the tracks if required to stop them. The staples straddle the tracks J J′ and rest against feeding devices. The feeding-plate P is mounted over and slides on the vertical guides *e*, in which the driver E reciprocates. This plate is raised by the bell-crank lever I, by means of a spring, *o*, secured to the vertical arm thereof pressing against a pin or projection, *o′*, on the slotted arm or lever O, which lever is pivoted to the lug *c* by the same pin or bolt that secures the bell-crank lever I to said lug *c*. A pin, *p*, on the plate P, engages in the slot in the lever O. When the lever I moves to operate the slat-clamping device, it raises the spacing or separating plate P through

the pin p, lever O, and pin o', as shown in Fig. 12, thus allowing the staples to slide down on the track J and to or against the driving-arm E. When the clamping device is raised by the lever I, the spring o forces the plate P down, which plate is provided with a pointed end, p', beveled on the side next to the driver E sufficiently to allow one staple to remain between this pointed end and the driver E when the plate P is down. When the driver E is raised, this one staple slips off the lower end of the track J into the guideway e of the driving-arm E, ready to be forced down into the rod at the next stroke of the driver, the other staples being prevented from following it by the separating-plate P.

To prevent the staple when in the guide e from falling down onto the rod at the wrong time, I provide a yielding spring-stop, j^3, in the track J, as shown in Fig. 12. This stop projects from the end of the track J into the guideway e a sufficient distance to arrest the downward movement of the staple. It has a rounded or tapered end, and the spring is made quite weak, so as to be readily forced back into the track out of the way by the driving-arm as it descends.

The track J′, over which the slat-staples are fed, is so arranged as to run parallel to the frame of the machine when near the separating device, and its lower end, j^4, serves as a guideway for the segmental driving-arm D. A forked separator, R, pivoted to the frame at r, is provided at one end with a pin or projection carrying a friction-roller, r', and its other end is cut or shaped so as to form two prongs or forks, r^2 and r^3, as shown clearly in Figs. 14 and 15. A spring, s, pressing on the roller r' of the separator R, tends to keep the upper end thereof in close proximity to the frame, and the lower end or fork, r^2, away from said frame and over the track J′. When the cam s' is moved by the rocking finger s^2, it passes between the frame C, to which it is pivoted, and the roller r' which causes the fork r^2 to leave the track J′ and the fork r^3 to take its place, in doing which a staple is separated from those on the track J′ and allowed to travel down toward the driving-arm D. The rocking finger, in returning to its normal position, (see Figs. 8, 10, and 11,) carries the staple down the track J′ and presents it to the driving-arm D. This rocking finger is operated from the bar I^2 by means of a pinion, s^3, mounted on a square end stud, s^4, on the finger, the pivoted segment s^5, and the toggle-joint links s^6 s^7, as illustrated in Fig. 3.

I provide a number of ratchet feed-bars, T, and attach them to the rods to be stapled by the hooks t. The rods are intermittently fed forward by means of these ratchets engaging a pawl, t', on the end of a link, t^2, pivoted to the frame at h. Motion is communicated at the proper time from the arm H^2 of the lever H, which arm is provided with the small projections h^2, which engage with a pin or projection, t^3, on the link t^2. Stops h' are provided to limit the movement of the link t^2.

H′ is a handle to operate the lever H, and g' is a spring-stop secured to the frame C, and which prevents the cam-lever G from fallling back.

The operation of my newly-invented machine is as follows: The hoppers are filled with staples, and a rod, having been first secured to the ratchet-bar T, and slat are placed in position, as shown in Fig. 1. The lever H is then raised, as in Fig. 8, and then lowered, as in Fig. 10. Every movement of the lever causes the pawls to revolve the disk-shaft through the ratchet l, one pawl operating when the lever is being raised and the other when the lever is being lowered. As the hooked disks N, which are secured or mounted on the shaft, revolve, the hooks engage staple after staple and carry them upward, and as the hook carrying a staple begins to leave the highest point in its vertical plane of travel the staple being unconfined will begin to slide along the straight portion of the disk N from the hook n to and over the points n' and j^2 onto the tracks to and against the plates R and P, the thickness of the points n' and j^2 being such that the smallest sized staple used to wire blinds will readily pass over or straddle them both. The forked separator R, rocking on its pivot r, oscillates backward and forward across the top of the track J′, and separates one staple at a time from those on the track. As the rocking finger s^2 sweeps around, it engages this staple and carries it to the point of the driver D, (see said Fig. 8,) whence it is forced by said driver D horizontally into the slat when the lever is lowered as in Fig. 9. The clamping device i^2, having been operated also, holds the slat firmly, so as to permit the driving-arm D to force the staple into the slat, at the same time the separating-plate P is raised and the inclination of the track J is such that one staple immediately falls from said track into the groove e, where it rests on the pin j^3. The lever is then lowered, (see Fig. 10,) and as the lever H forces the driving-arm E down the driver D is withdrawn, so that the arm E can force or drive the staple from the groove e into the rod, one prong passing through the eye of the slat-staple, thus hinging the slat and the rod together. At the same time the separating-plate P is lowered to the track J and separates the next staple, while the rocking finger s^2 brings the next slat-staple, which has been separated by the forked plate R, up against the driver D, and places it under the end of said driver as soon as the lever is raised again, as in Fig. 8. The slat is released from the clamping device, and the rod is moved forward by the ratchet T and pawl t' while the lever H is being thus raised. Another slat is then placed in position, the lever lowered, and the operation thus continued until the required number of slats have been stapled and secured to the rod.

It will be observed that the joint *f* of the toggle-links F F′ describes a circle around the pivot *g* as a center. The link F′ raises the arm E to its full height. (See Fig. 11.) In order to cause the toggle-joint *f* to pass the center, I make the upper edge of this link F′ hooked or cam-shaped, as shown, and provide the cushioned stop E′ to assist the movement.

I provide the lever G with a cam end, so as that while the lever is passing from the position shown in Fig. 9 to that illustrated in Fig. 10 it presses on this short cam end and forces the toggle-joint *f* up and against the spring *g′*. The lever G passes over the spring *g′*, pressing its free end against the frame, and when the lever G has cleared the spring the end thereof acts as a stop for the lever to rest upon, and thereby prevents said lever from falling down.

For convenience in drafting, I have shown the lever H as being operated by a handle; but I do not wish to be limited to such construction, as it is obvious that my machine may be operated from a continuously-revolving shaft by simply connecting the lever H to said shaft by means of any of the common and well-known methods.

v is a stripper adjustably secured to the lug *c* of the frame by the screw *v′*, so as to insure the slats clearing the clamping-plate i^2, and thereby allowing the rods to be fed forward.

Having described my invention, what I claim is—

1. In a blind-stapling machine, the driving-arms for driving a staple into the slat and a staple into the rod, the rod-staple interlocking with the slat-staple, an operating-lever connected to said driving-arms, a staple-guiding track for each driving-arm, and feeding devices above said tracks connected to said operating-lever, whereby by the return-stroke of the lever a staple is automatically fed to each driving-arm, all combined and operating substantially as specified.

2. In a blind-stapling machine, the combination of staple hopper or hoppers, of track or tracks from said hoppers to each driving-arm, of an intermittently-rotated disk mounted in said hoppers near the end of said track or tracks, and the staple-driving arms, said disk being provided with proper hooks and being operated by the driving-arm operating-lever, substantially as specified.

3. In a blind-stapling machine, the combination, with the driving-arms, of tracks for conveying staples from the hoppers to the tracks, of the hoppers for holding the staples, of an intermittently-revolving shaft mounted in said hoppers having a stirring-arm and a hooked disk secured thereon, and of pawl-and-ratchet or equivalent mechanism for intermittently rotating said shaft from the operating-lever, arranged and operating substantially as specified.

4. The combination of a hopper of a blind-stapling machine with a revolving disk or stirrer-arms or both secured to a shaft mounted therein, a hood hinged to said hopper, and a pawl-and-ratchet or other mechanism for operating said shaft from the operating-lever of the machine, substantially as and for the purpose set forth.

5. In a blind-stapling machine, the combination, with the driving-arm and a track leading thereto, of an automatic feeding device consisting of the separator R, pivoted above said track, said separator having one end bent or fork-shaped, as at r^2 r^3, of a cam for moving said separator in one direction, and a spring for moving it in the opposite direction, substantially as and for the purpose specified.

6. The combination of the track J′ of a blind-stapling machine, separator R, pivoted to the machine above said track and provided at its lower end with forked or bent portions r^2 r^3, and at its upper end with roller *r′*, with the spring *s* and swinging cam *s′*, pivoted to the machine so as to pass between the frame and the roller *r′*, the rocking finger s^2, secured to the pinion s^3 and operated from the lever H through the segmental gear s^5 and links s^6 s^7, bar I^2, and arm I^5, substantially as specified.

7. In a blind-stapling machine, the track J′, leading from the staple-hopper to the driving-arm D, having its upper edge tapered so as to permit a staple to straddle it and slide thereon, and having its lower end, j^4, shaped to receive the staple from the edge of the track and form a guideway for said staple and arm D, substantially as specified.

8. In a blind-stapling machine, the combination, with a driving-arm, E, and a staple-guiding track, J, leading thereto, of the separating-plate P, said plate having a beveled pointed end, *p′*, and a pin, *p*, said pin *p* engaging the slot in the lever O, whereby said plate P is raised and lowered with each stroke of the driving-arm so as to present but one staple at a time to said arm, substantially as specified.

9. In a blind-stapling machine, the combination, with a vertical driving-arm and a staple-track leading thereto, of a pin or stop, j^3, mounted in the track and having a rounded or tapered end, and a spring also mounted in said track and pressing said stop j^3 into or partially into the guideway *e* of said driving-arm, whereby a staple may be retained in position for the next stroke of the driving-arm, substantially as specified.

10. In a blind-stapling machine, the combination of the vertical driving-arm E and lever H with means for operating said arm from said lever, consisting of the cam-lever G, pivoted to the frame of the machine, and the link F′, secured at one end to the lever H and at the other to the lever G, and having a hook, *f′*, to engage the projection or roller e^2 on the arm E, substantially as specified.

11. In a blind-stapling machine, the combination, with the operating-lever H, of the link F′, cam-lever G, vertical driving-arm E, and

a spring-stop, E′, secured in the upper end of the guideway *e*, substantially as and for the purpose specified.

12. In a blind-stapling machine, the slat-clamping device *i* i^2, adjustable by means of the screws *i′* i^3, in combination with the driving-arm and the operating-lever, and means for connecting said device to said lever, whereby the slat is clamped in position when the arm drives the staple, substantially as specified.

13. In a blind-stapling machine, the combination of the pivoted driving-arm D and the operating lever H with means for operating said arm from said lever, consisting of the cam-lever G, pivoted to the frame of the machine, the link F, secured at one end to the driving-arm D and at the other end to said cam-lever G, the link F′, secured at one end to the lever H and at the other end also secured to said lever G at or near the same point with said link F, and a spring, *g*, secured to the frame of the machine and operating as a stop for the lever G, substantially as and for the purpose specified.

14. In a blind-stapling machine, the combination of the slat-clamping device *i* i^2 and a stationary stripper, *v*, adjustably secured to the machine by means of the screw *v′* passing through a slot in said stripper, whereby the slats are caused to clear the said clamping device when released thereby, substantially as specified.

In witness whereof I have hereunto set my hand this 27th day of December, A. D. 1884, at Chicago, Illinois.

NICHOLAS P. PETERSON.

Witnesses:

TAYLOR E. BROWN,

LEW. E. CURTIS.