

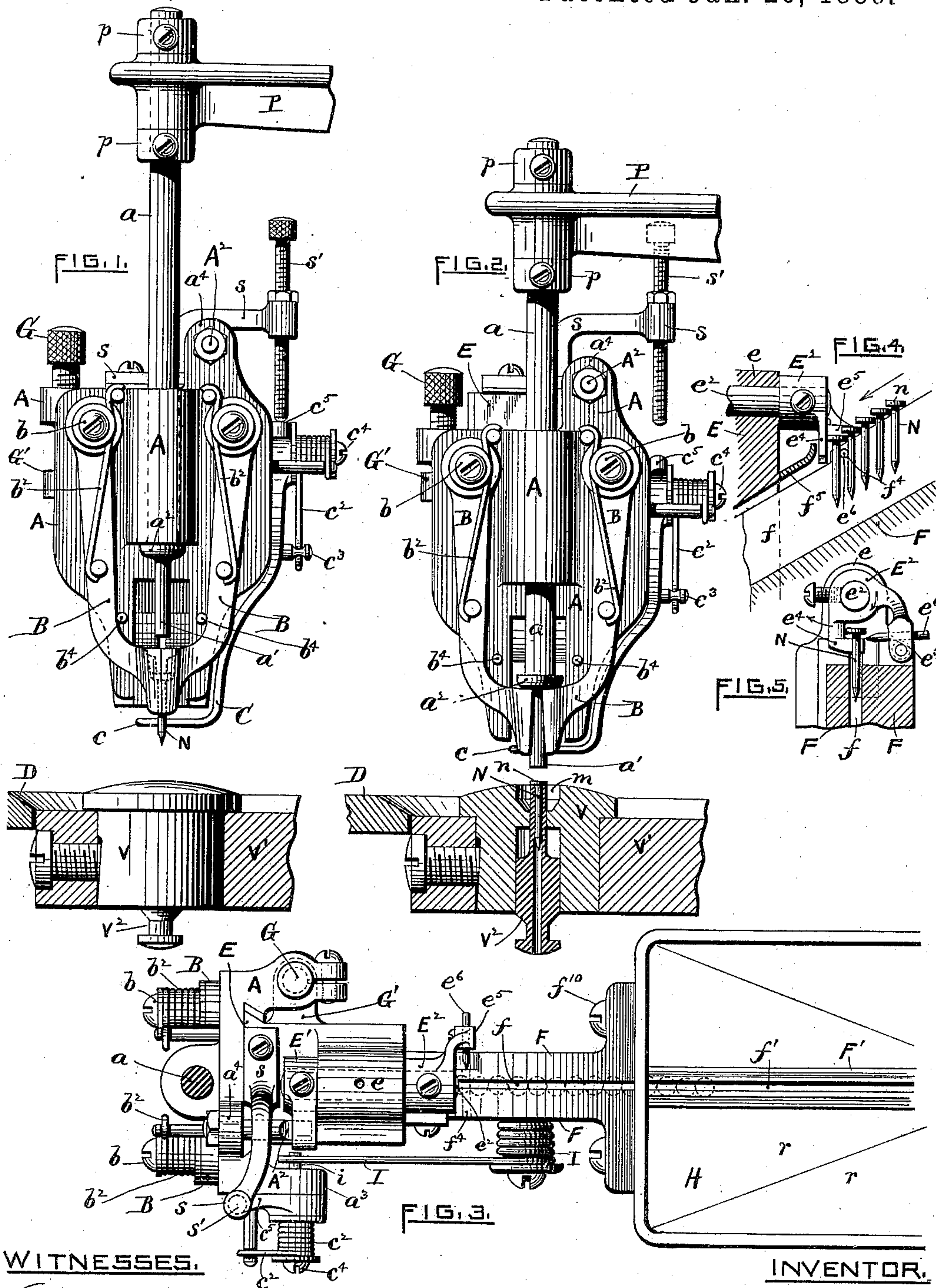
(No Model.)

2 Sheets—Sheet 1.

C. D. ROGERS.  
NAIL FEEDING MECHANISM.

No. 334,898.

Patented Jan. 26, 1886.



WITNESSES.

*Charles Hannigan*  
*Frank A. Gay*

INVENTOR.

*Charles D. Rogers.*  
*by Geo. H. Remington,*  
*Att'y.*



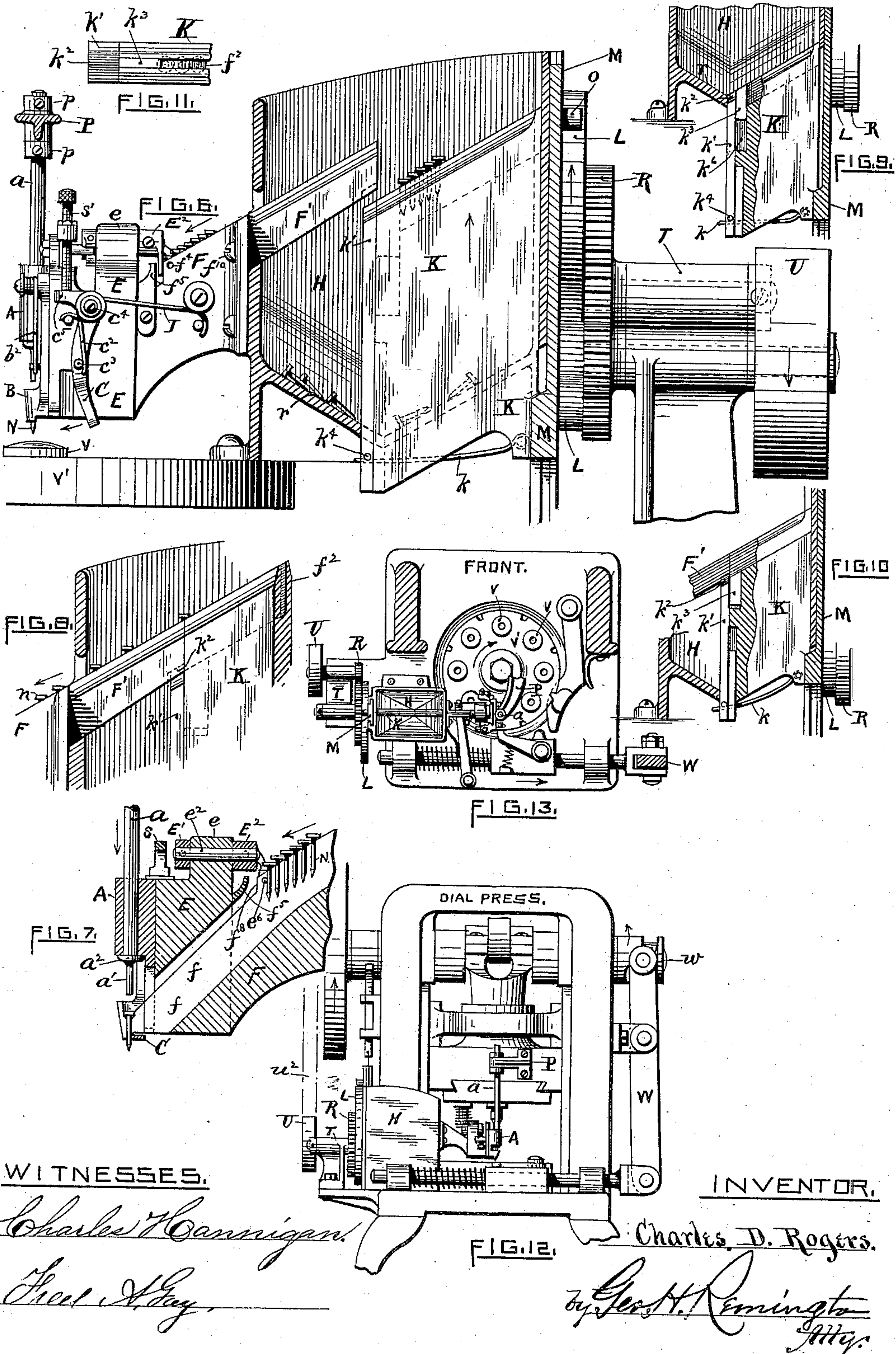
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2 Sheets—Sheet 2.

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*Charles H. Cannigan*  
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INVENTOR.

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# UNITED STATES PATENT OFFICE.

CHARLES D. ROGERS, OF PROVIDENCE, RHODE ISLAND.

## NAIL-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 334,898, dated January 26, 1886.

Application filed October 21, 1885. Serial No. 180,472. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES D. ROGERS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Devices for Automatically Feeding Nails, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My present invention relates to mechanism for automatically feeding metallic nails to the dies or holders of a dial-press, said nails being subsequently capped with leather or other suitable material.

The invention consists, essentially, in the novel construction of the sliding frame or head having separable spring-actuated jaws pivoted thereto, means for intermittently depositing a nail within the jaws, and a combined supporting and centering device for the nail.

It also consists, in combination with the above-said mechanism, of a reservoir or hopper for the loose nails, the same having a grooved blade or "pick-up" moving vertically therein, adapted to coincide with an inclined track or ways secured to the upper portion of the hopper for the purpose of conducting the nails from the pick-up to the ways, and thence to the retaining-jaws.

It consists, finally, in the improved construction of the said pick-up blade or movable ways, the same having a spring-actuated stop connected to and forming the inner vertical edge thereof, by means of which the nails are prevented from falling off to clog the throat of the stationary ways, while the nails regularly arranged in the channel of the blade are retained in place until said stop engages with the stationary track, the blade continuing upward to its limit, thereby withdrawing the stop and adapting the nails to slide freely down the track until arrested by the intermittently-working separator or "hawk's bill," all as will be more fully hereinafter set forth and claimed.

The object of my invention is, primarily, to

provide a dial-press or other machinery adapted to cap nail-heads with leather, &c., with mechanism for automatically feeding the nails to the dies or holders, thereby greatly increasing the productive capacity of the machine, as well as producing better goods, and also reducing the percentage of imperfect work to a minimum as compared with machines wherein the nails are placed in the dies by means of an attendant.

In the accompanying two sheets of drawings, which I have prepared to form a part of this specification, Figure 1, Sheet 1, represents a front view of the device, showing the head thereof raised to its limit, a nail being in position in the jaws, and also showing a portion of the dial and its die-holder in position beneath to receive the nail. Fig. 2 is a similar view showing the head depressed to its limit, the plunger also being in its lowest position, the latter having forced the nail down into the annular die or holder, which, together with the dial, is represented in central section. Fig. 3 is a plan view of the same, and also showing a portion of the hopper, to which it is attached. Fig. 4 is a detached sectional side view showing the hawk's bill or device for separating the lowest nail from the rest of the column. Fig. 5 is a sectional end view of the same, showing the pin in the act of passing back of the said lowest nail, thereby adapting it to slide freely down the incline and into the jaws. Fig. 6, Sheet 2, is a reduced side view of the device complete, corresponding to Fig. 1, the hopper, however, being shown in section and the pick-up blade moving upward by means of the cam, gears, &c. Fig. 7 is a partial longitudinal sectional view through the center of the feeding device after the plunger has started downwardly in its course. Fig. 8 is a partial sectional view showing the upper portion of the hopper with nails sliding down its track. Fig. 9 is a reduced sectional view of the hopper, showing the sliding blade in its lowest position. Fig. 10 is a similar view showing the blade in its highest position, the sliding end or stop being in contact with the stationary ways, by means of which the nails of the blade are adapted to slide onto the stationary or fixed ways, and thence to the holding-jaws. Fig. 11 is an en-



larged plan view of a portion of the blade, showing the movable end connected therewith. Fig. 12 is a rear view in elevation of a dial-press provided with my improved automatic mechanism for feeding nails to the dies of the intermittently-revolving dial; and Fig. 13 is a horizontal sectional view of the same, showing the relative arrangement of the device and dial.

The following is a more detailed description of the invention:

A, again referring to the drawings, designates the sliding frame or head, the same being gibbed to the stationary frame E, which is secured to the sides F F, Fig. 6, the latter in turn being secured to the walls of the hopper H, as fully shown. Extending in front along the center of the vertical face of the frame A is formed an ear or projection, which is drilled to loosely receive the rod or plunger  $a$ , the lower portion,  $a'$ , thereof being reduced in diameter to correspond substantially with the head  $n$  of the nails N,  $a^2$  being a collar formed on said plunger, adapted to bear against the under side of the said projection for the purpose of lifting the frame A and its attachments. The upper end of the plunger  $a$  passes through an arm, P, which is secured to the cross-head or other suitable moving part of the press for the purpose of operating said frame. Collars  $p$   $p$  serve to adjust and retain said arm and plunger in proper relation.

At  $b$   $b$  of the frame A are pivoted the nail-holding jaws B B, which are kept closed by means of springs  $b^2$ , all secured to the sliding frame, as fully shown. The lower portion of the jaws is provided with the central hole, (half in each,) adapted to receive the nail N therein, said hole opening rearwardly into and connecting with the lower end of the ways  $f$ , Fig. 7.

$G'$  is a lug or stop formed on one side of the stationary frame E, which, in connection with the adjusting-screw G of the frame A, serves to limit the downward movement thereof, a spring, I, Fig. 3, which bears against the pin  $i$ , secured to the movable frame, causing the latter to remain in this position, Fig. 2, except when in contact with the collar  $a^2$  of the plunger.

S indicates a bent arm secured to the top of the frame E, the same being tapped to receive the adjusting-screw S', as fully shown in the several figures.

C designates a spring-actuated bell-crank lever pivoted on  $c^4$  to the frame A, the long arm thereof extending downwardly and being bent to project beyond the center of the plunger  $a$ , as at  $c$ , the other or short arm,  $c^5$ , of the lever being arranged to engage with the end of the adjusting-screw  $s'$ , just described. By means of this device the said lever is swung back when the frame A is at or near the end of its upward stroke, (Fig. 6,) thereby permitting a nail to slide into the jaws B. Upon the return-stroke the arm  $c^5$

falls away from the screw, by means of which the spring  $c^2$ , bearing against a pin,  $c^3$ , of the lever, forces the latter against the rear of the nail, Fig. 7, thereby centering and retaining it in position to be inserted into the die or holder beneath.

E indicates the stationary frame, on which the head A vertically moves, said frame having an ear or hub,  $e$ , formed thereon, at the top of which is drilled to receive the short shaft,  $e^2$ , the latter having an arm, E', secured to its front end adapted to engage a pin, A<sup>2</sup>, mounted in an ear,  $a^4$ , of the head A, Fig. 3, for the purpose of rocking the shaft as the head approaches the limit of its upward stroke. To the rear end of said shaft  $e^2$  is secured a bent two-armed lever, E<sup>2</sup>, Figs. 4 and 5, termed a "hawk's bill," which serves to automatically separate the lowest nail from the others of the column resting in and supported by the ways or track F, the same being effected by inserting the pin  $e^6$  of the arm  $e^5$  into the hole  $f^4$ , the arm  $e^4$  at the same time moving in the arrow direction and permitting said nail to drop and be guided or deflected by the shield  $f^5$  down the space  $f$  of the ways and into the lower end of the jaws B, all as fully shown.

H designates the reservoir or "hopper," which is secured at any convenient place to the machine, said hopper having its bottom surface,  $r$ , inclined toward the center thereof, as shown in Sheet 2 of the drawings.

K indicates a thin blade or pick-up, which is adapted to slide freely up and down in the hopper by means of its connection with a bar, M, having a pin,  $o$ , at the upper end engaging a cam, L, the latter in turn being actuated by gears R, secured to shafts mounted in bearings T, a belt,  $u^2$ , transmitting power from the press to the pulley U for the purpose of revolving said gears, &c., as shown in Figs. 12 and 13. The top edge of the blade K is made inclined, and provided with the groove or channel  $f^2$ , adapted to retain the nails therein, the inner vertical edge of the blade being provided with the elongated stop  $k'$ , the same being dovetailed or otherwise secured to the blade, so as to admit of its sliding vertically thereon. The top end of said stop is beveled at  $k^2$ , and provided with the tongue  $k^3$ , which loosely fits into an opening,  $k^6$ , and also fills the lower portion of said channel  $f^2$  of the blade, Fig. 11. A spring,  $k$ , is secured to the blade K, the same bearing against a pin,  $k^4$ , of the stop  $k'$ , for the purpose of retaining the latter in its normal position, as in Fig. 6.

F' is a continuation of the track or ways F, the same extending into the hopper and adapted to form a union with the channel  $f^2$  of the sliding blade when the latter is in its extreme or highest position, as in Fig. 8. By means of this arrangement of the parts F' and K it is practically found that the blade K is more readily freed from the surplus nails than would be the case if the blade were made the



width of the hopper, and thereby dispensing with the said portion  $F'$  of the ways, as in the latter event the surplus nails would slide down and pile up within the hopper adjacent to the track  $F$ , thereby obstructing the said track and preventing the proper working of the device.

Figs. 12 and 13, as hereinbefore stated, represent views of a "dial-press," so called, provided with my improved automatic nail-feeding mechanism as in use, said press having a base, frame, plunger and dies, and an intermittently-revolving dial,  $V'$ , as common, the dial being provided with a series of circular-ly-arranged dies,  $V$ , each having a mold,  $m$ , therein adapted to receive the vertically-moving annular die or nail holder  $V^2$ , Fig. 2, which passes directly under the center of the nail-inserting plunger  $a$ .

The operation is substantially as follows: The nail-feeding device being attached, as shown—say, to a dial-press adapted to cap the nails with sole-leather or other suitable material—the plunger  $a$  is connected to and actuated by the press-plunger through the medium of the arm  $P$ , as fully shown. Nails  $N$  are now deposited in the hopper  $H$ , the blade or pick-up  $K$  thereof being operated by means of the cam, gears, &c. The said cam  $L$  is slowly revolved, thereby at each revolution, withdrawing the blade  $K$  down through the mass of nails and flush with the bottom of the hopper. (See Fig. 9.) Upon its return the blade collects a few nails within the channel  $f^2$  and carries them upward, the spring-stop  $k'$  at the same time serving to prevent the nails from sliding off prematurely. (See Fig. 6.) Now, as the blade nears the end of its stroke the top or beveled portion,  $k^2$ , of said stop engages with the under side of the stationary extension  $F'$ , (the surplus nails meanwhile falling off into the center portion of the hopper,) the spring  $k$  holding it (the stop) stationary while the blade proper moves upward and completes its stroke, thereby opening the lower end of the channel  $f^2$  and permitting the nails resting thereon to slide freely down the tracks  $F' F$ , the column of nails then resting against the pin  $e^6$  or arm  $e^4$  of the lever  $E^2$ , as shown in Figs. 4, 7, and 8. I make no specific claim, however, to the hopper provided with a moving blade or pick-up and mechanism for operating the same, except as to the spring-stop  $k'$ , combined and connected therewith for the purpose of both automatically closing and opening the said channel  $f^3$ , just described.

The manner of separating a nail from the column and inserting it in the die  $v^2$  or other suitably-arranged holder therefor is as follows: As the plunger  $a$ , by means of the arm  $P$  and its attached press-plunger, approaches the end of its upward stroke, the pin  $A^2$  of the sliding frame  $A$  engages with the under side of the lever  $E'$ , thereby vibrating the shaft  $e^2$  (see Fig. 5) in the arrow direction, by means

of which the arm  $e^4$  of the lever  $E^2$  is moved away from the nail, the pin  $e^6$  of the arm  $e^5$  at the same time moving in its rear to force it (the nail) over the depression  $f^8$ , Fig. 7, after which the nail slides freely down the ways  $f$  into the lower end of the jaws  $B$ , the lever  $C$  and plunger  $a$  then being in the extreme position shown in Fig. 6. Now, during the first movement of the frame  $A$ , with its attachments, in its downward stroke, the resistance of the spring  $I$  forces the frame to its limit corresponding to the engagement of the adjusting-screw  $G$  with the stationary stop  $G'$ . (See Fig. 2.) At the same time, also, the arm  $e^5$  of the lever  $C$  is released from the stop  $s'$ , thereby permitting the spring  $c^2$  to swing or move said lever, which thus carries the bent portion  $c$  thereof into contact with the nail for the purpose of holding it in position preparatory to its insertion in the holder. As the pin  $A^2$  moves away from the lever  $E'$ , the shaft  $e^2$  thereof vibrates slightly, which brings the arm  $e^4$  of the lever  $E^2$  into the normal position shown in Figs. 4 and 5, thereby holding stationary the column of nails and preventing a nail from entering the jaws until the return-stroke, as before described. The further downward course of the plunger causes the shoulder  $a^2$  thereof to be disengaged from the hub or bearing of the frame  $A$ , when, finally, the end portion,  $a'$ , of the plunger strikes the head of the vertically-held nail and forces it down between and out of the jaws  $B$  into the holder, as fully shown in Fig. 2. The plunger upon returning is withdrawn from the said pivoted jaws, the latter gradually closing together by means of the springs  $b^2$ , stops  $b^4$  at the same time serving to limit their movement. Now, as the shoulder  $a^2$  re-engages the hub, the plunger in its further upward movement will again lift the frame  $A$  and its attachments, with the consequent separation of a nail, &c., as before described. The dial  $v'$  is then intermittently revolved, which movement brings the nail with its holder and die directly in front and under the descending punch of the press, which now cuts out a blank and forces it down into the mold and over the head of the nail, thereby completely embedding it and completing the operation.

It is evident that the moving plunger  $a$ , with its other mechanism, may be as readily used to force nails or staples into or through a suitable blank or front and be clinched thereunder by means of a properly-shaped die.

I do not limit myself to the exact construction of the device as shown, nor to its combination with a dial-press adapted to cover nail-heads with suitable material, as it is obvious that the device with slight changes is equally adapted to feed other shaped nails or blanks without departing from the spirit of the invention.

I do not claim as my invention the dial-press represented in Figs. 12 and 13, either as a



whole or in detail, except as it is combined with the plunger *a*, &c., of the automatic nail-feeding mechanism, hereinafter claimed.

Having thus described the invention, what I claim is—

1. The combination, with a reservoir, track, and mechanism, substantially as shown and described, for holding and separating the column of nails or blanks, of a vertically-moving plunger carrying a cross-head or frame provided with spring closing-jaws adapted to hold a nail, and a spring-lever constructed to center and support said nail during the operation of inserting it in a holder or other receiver therefor, substantially as shown and hereinbefore set forth.

2. In a nail-feeding device provided with an inclined track, and mechanism for automatically separating the nails, the combination of the head or frame loosely mounted on a stationary frame, two spring-actuated jaws pivoted to the head, a spring-actuated lever pivoted to said head, adapted to automatically bear against a nail and retain it in position in said jaws, and a suitably-operated shouldered plunger mounted in the head, adapted to both move said head and forcibly eject the nail from said jaws and insert it in a suitable die or holder, substantially as shown and set forth.

3. In a nail-feeding device, a hopper having the stationary track or ways *F f*, secured thereto, and the immovable frame *E*, connected therewith, provided with the nail-separating device or hawk's bill, substantially as shown and described, in combination with the head *A*, freely mounted on the frame *E*, two spring closing-jaws, *B*, pivoted to the head, a spring-lever pivoted also to said head, adapted to center and support a nail, a shouldered plunger, *a*, mounted in the head, adapted both to lift said head and insert the nail, a spring, *I*, and adjusting screw *G*, adapted to limit the downward movement of the head, the whole arranged substantially as shown, and for the purposes hereinbefore set forth.

4. In a nail-feeding device, the combination, with the hopper or reservoir *H*, having an elongated opening in its base and an inclined track

secured to and extending into the hopper, of the elongated blade or pick-up, adapted to move up and down in the hopper, and means for effecting said movement, substantially as shown and hereinbefore set forth.

5. In a nail-feeding device, in combination with the hopper *H*, having an inclined track, *F'*, secured to and extending into the hopper, of the vertically-moving blade *K*, having the spring-stop *k'*, mounted thereon, substantially as shown, and for the purpose hereinbefore set forth.

6. In a reservoir or hopper, *H*, having the inwardly-projecting ways or track *F'*, secured thereto, the vertically-moving blade *K*, having a spring, *k*, secured to its lower end, in combination with the loosely-mounted stop *k'*, forming the inner vertical edge of the blade, said stop engaging the free end of the spring, and adapted to connect with the end of the track *F'*, substantially as shown and set forth.

7. A dial-press adapted to cap the heads of nails, &c., with sole-leather or other suitable material, in combination with the automatic nail-feeding device hereinbefore described, the same consisting of the hopper *H*, having the blade or pick-up *K*, moving vertically therein, the track *F' F*, secured to the hopper, adapted to receive the nails from said blade, mechanism for automatically separating the column of nails, the frame *E*, secured to the track or ways *F*, the head *A*, mounted loosely on said frame, having two spring closing-jaws, *B*, and nail-retaining spring-lever *C*, pivoted thereto, a spring, *I*, adjusting-screw *G*, and stop *G'*, for controlling the downward movement of said head, and the shouldered plunger *a*, passing through the head and connected with suitable moving parts of the press, the whole combined, arranged, and adapted for use substantially as shown and set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES D. ROGERS.

Witnesses:

GEO. H. REMINGTON,  
CHARLES HANNIGAN.