

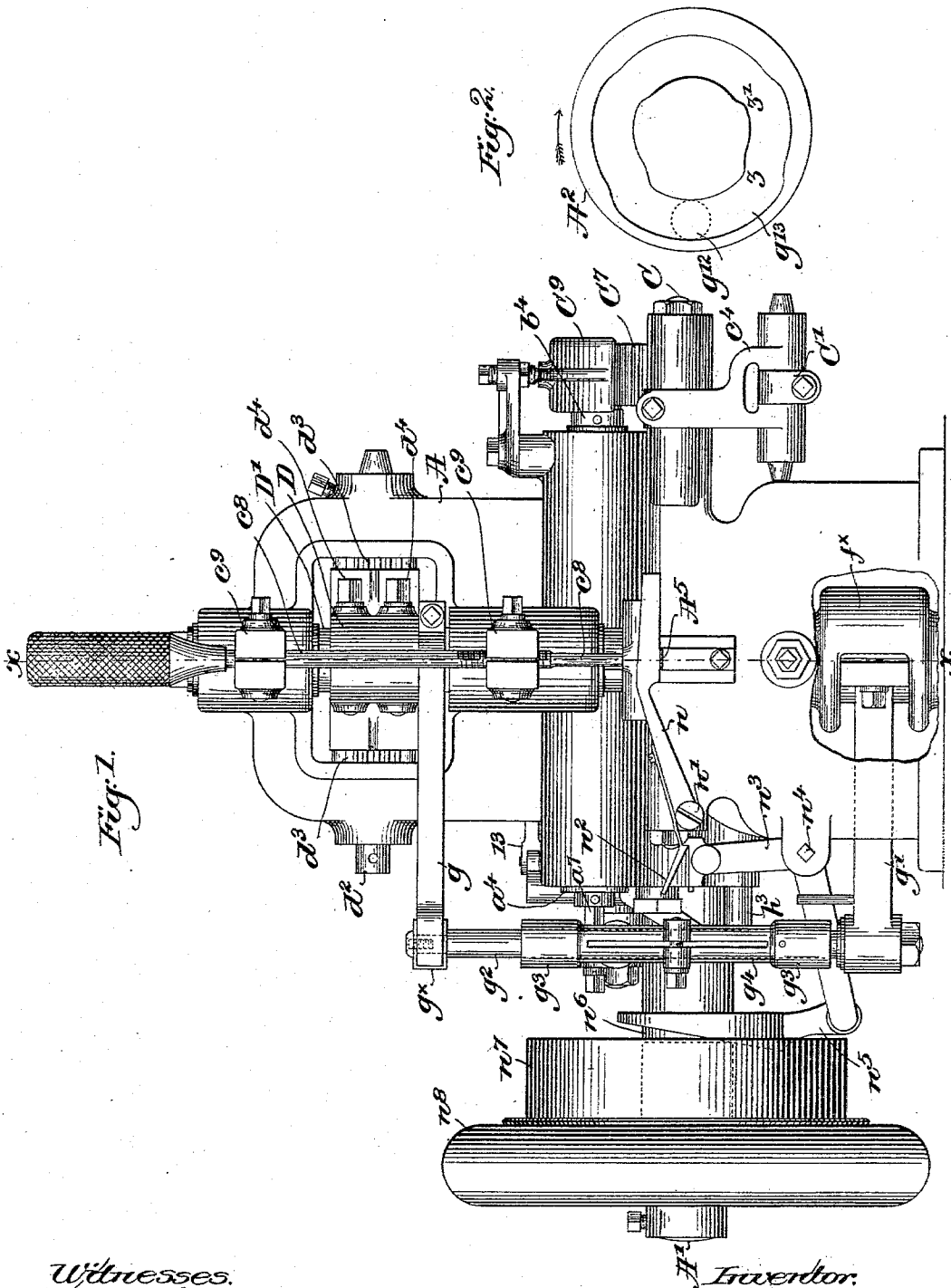
(No Model.)

5 Sheets—Sheet 1.

L. GODDU.
TACK OR NAIL MACHINE.

No. 552,903.

Patented Jan. 14, 1896.



Witnesses.
Edward F. Allen.
Thomas Drummond.

Inventor.
Louis Goddu.
by Crosby & Gregory, attys.

(No Model.)

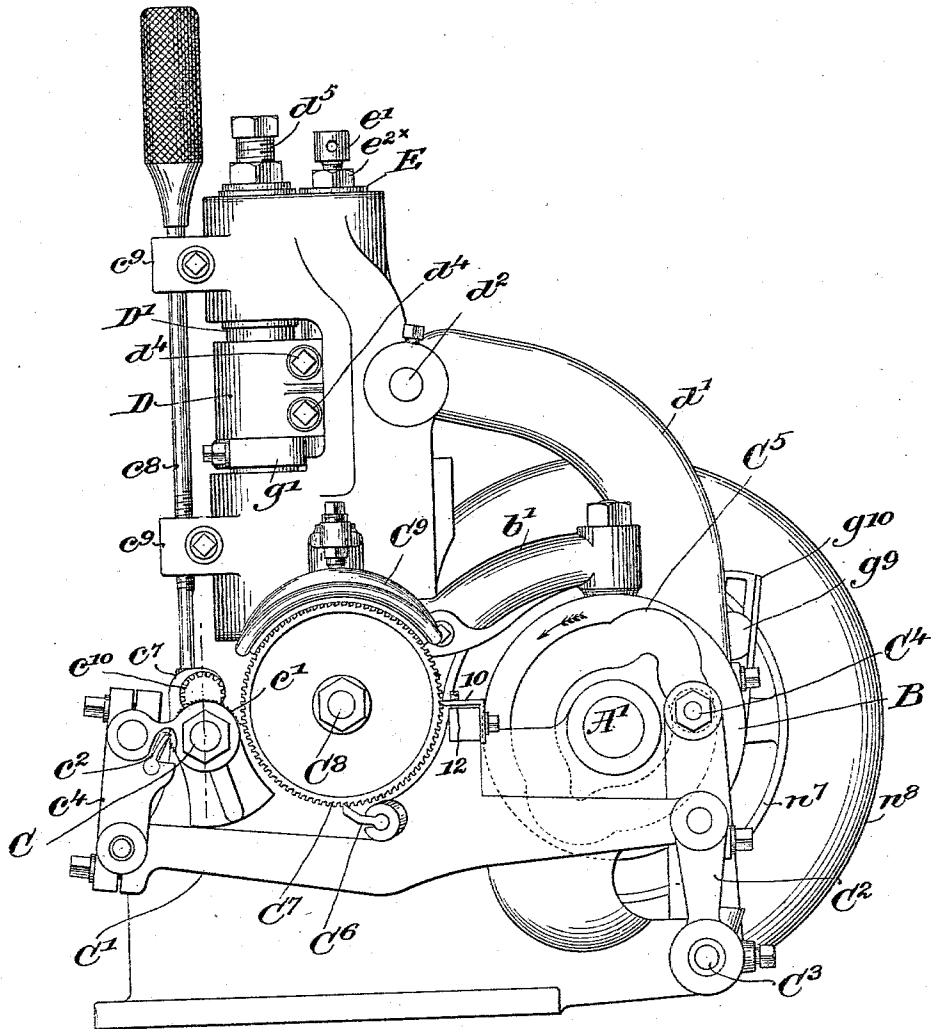
5 Sheets—Sheet 2.

L. GODDU.
TACK OR NAIL MACHINE.

No. 552,903.

Patented Jan. 14, 1896.

Fig. 3.



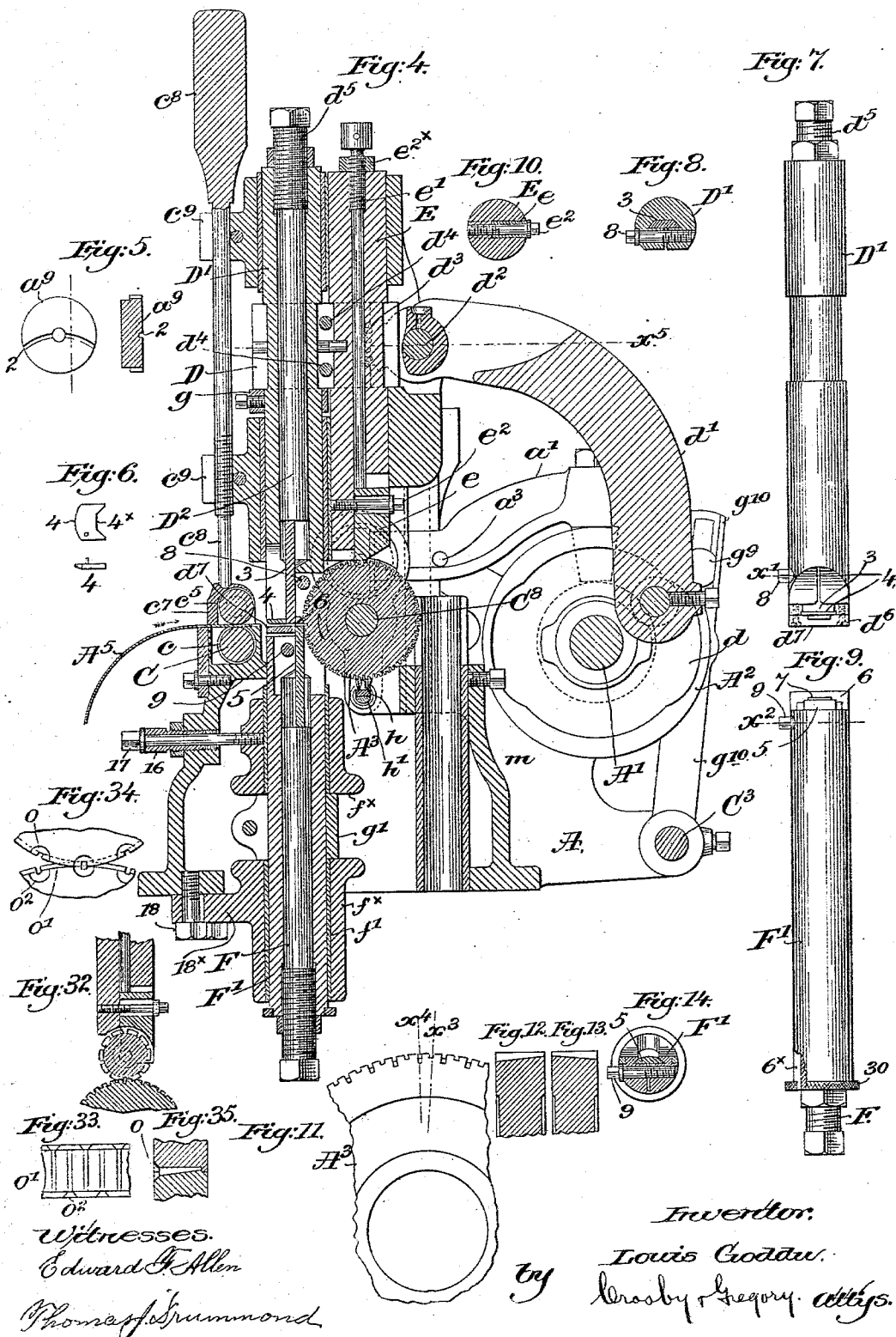
Witnesses.
Edward F. Allen
Thomas J. Hammond.

Inventor
Louis Goddu
by Wesley Gregory, attys.

L. GODDU.
TACK OR NAIL MACHINE.

No. 552,903.

Patented Jan. 14, 1896.



(No Model.)

5 Sheets—Sheet 4.

L. GODDU.
TACK OR NAIL MACHINE.

No. 552,903.

Patented Jan. 14, 1896.

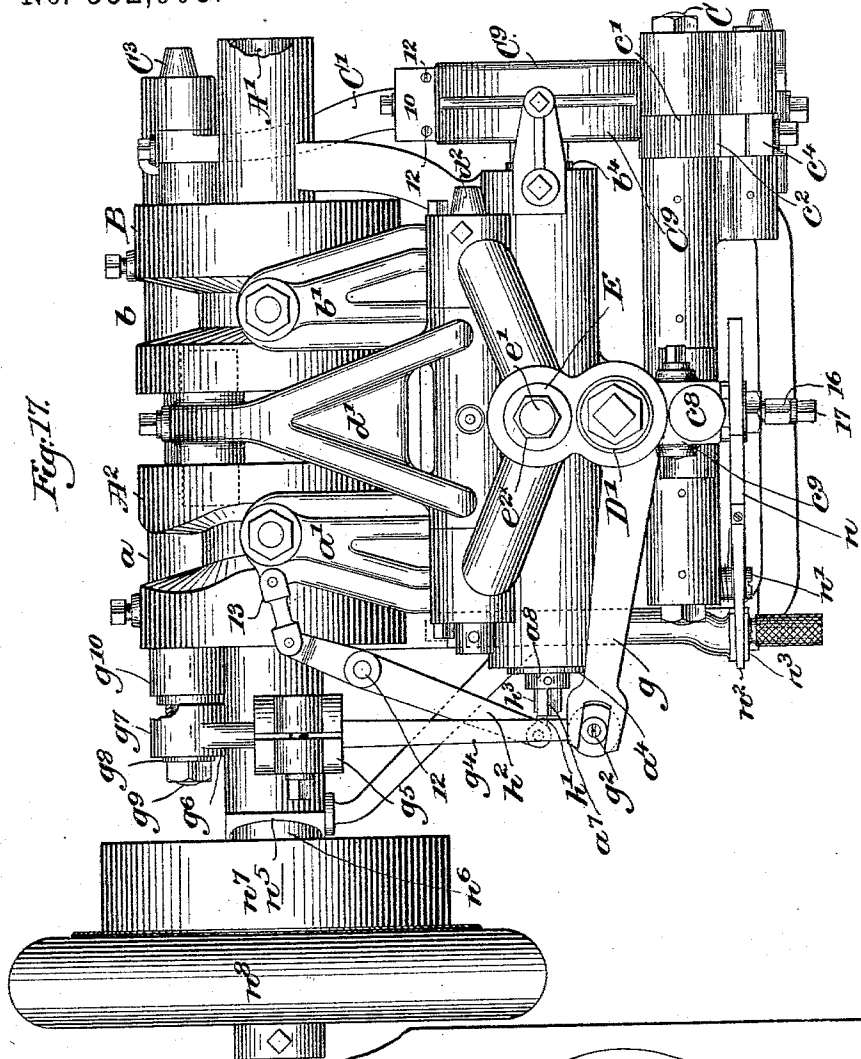


Fig. 16.
B b

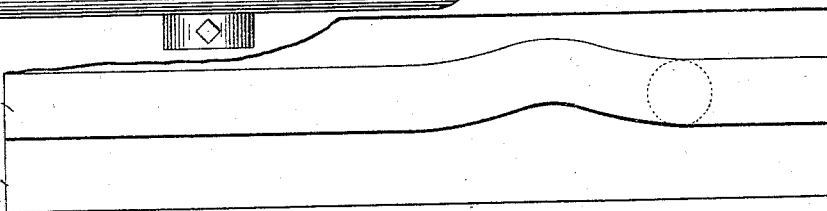
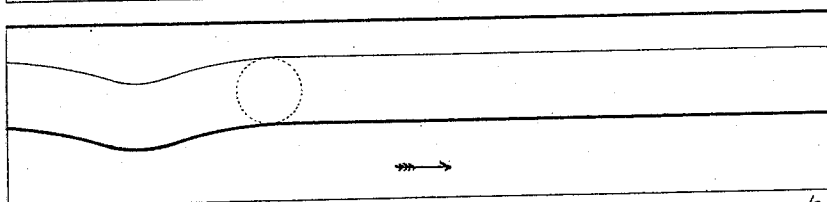


Fig. 15.
A² a



Witnesses.

Edward F. Allen

Thomas J. Sumner

Inventor

Louis Goddu

by Crosby & Gregory, attys

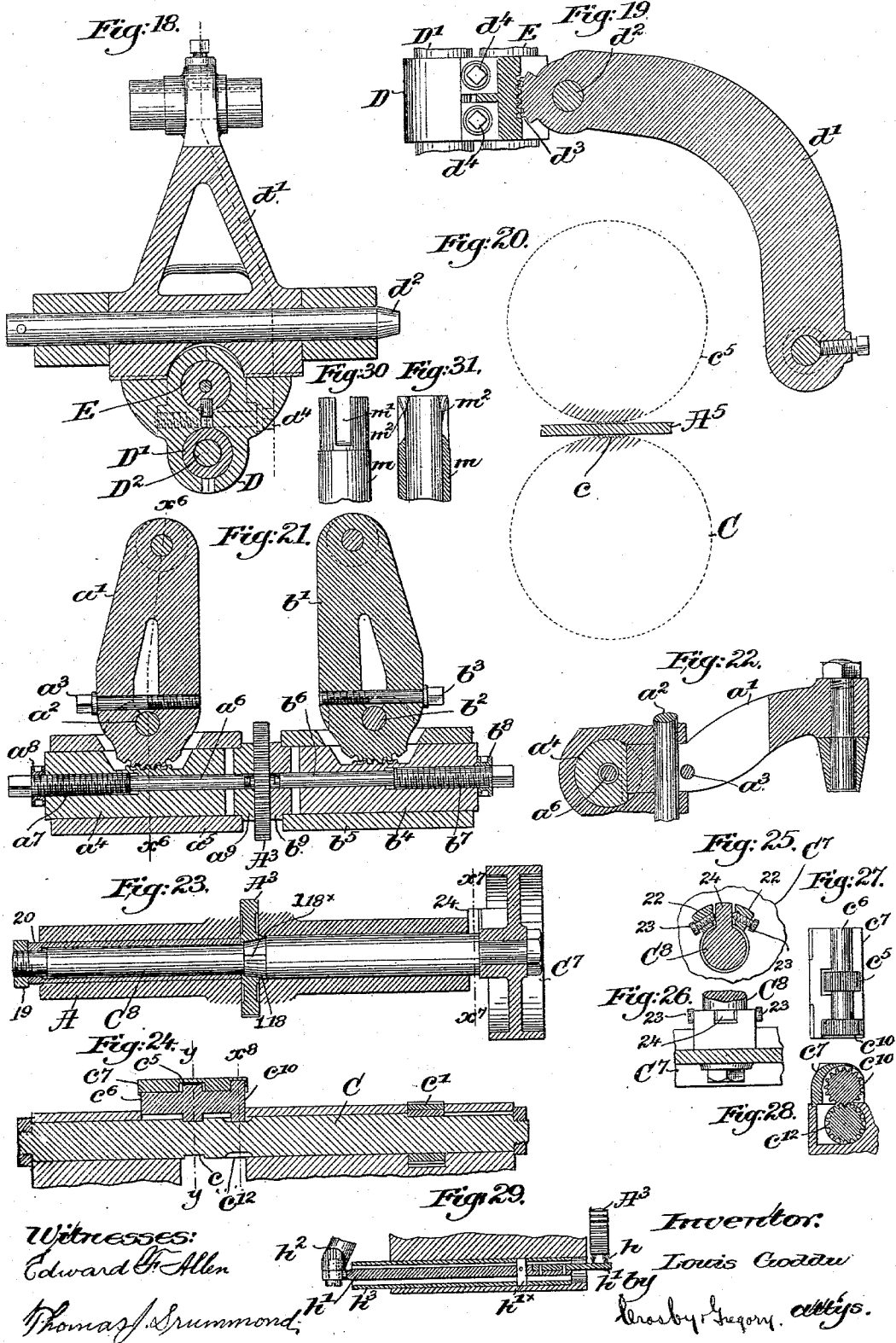
(No Model.)

5 Sheets—Sheet 5.

L. GODDU.
TACK OR NAIL MACHINE.

No. 552,903.

Patented Jan. 14, 1896.



UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE.

TACK OR NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 552,903, dated January 14, 1896.

Application filed December 18, 1894. Serial No. 532,170. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GODDU, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Tack or Nail Making Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of an improved machine for the manufacture of headed tacks or nails from a metallic strip which is severed transversely at a greater or less angle, according to the taper desired for the tack or nail.

The end of the strip is fed automatically into a strip-throat having co-operating with it strip-cutters, and a tack or nail blank having been severed from the strip is fed into a blank-throat from which it is delivered into one or another of a series of die-grooves in a die-roll, said grooves being of various depths from their outer to their inner ends, and being arranged with their deeper outer ends alternating. The strip-throat and the blank-throat, together with the cutting-mechanism, have combined with them devices by which they may be oscillated more or less, according to the taper desired for the tack or nail. The blanks are kept down into their respective die-grooves by a suitable presser, while headers operate on the projecting ends of the blanks to head them in the die-grooves, the presser also operating to conform the sides of the blanks to the die-grooves. Novel devices have also been employed for effecting the discharge of the headed tacks or nails from the die-grooves.

Figure 1 in front elevation represents a sufficient portion of a tack or nail making machine containing my improvements to enable my invention to be understood; Fig. 2, a detail showing one side of the cam-hub A^2 . Fig. 3 is a right-hand end elevation of the machine shown in Fig. 1. Fig. 4 is a partial section in the line x , Fig. 1; Fig. 5, details of one of the side guides for the die-roll; Fig. 6, a detail showing the cap-plate 4 detached. Fig. 7, in elevation, shows the movable knife-holding bar. Fig. 8 is a section thereof in the line x' . (See Fig. 7.) Fig. 9 shows in

elevation the stationary knife-holder. Fig. 10 shows a sectional detail of part of the lower end of the plunger E and the presser e . Fig. 11 is an enlarged partial side elevation of the die-roll. Figs. 12 and 13 represent sections of portions of the die-roll, the said sections being in the lines x^3 and x^4 , respectively. (See Fig. 11.) Fig. 14 is a section on the line x^2 , Fig. 9. Figs. 15 and 16 show the cams A^2 and B laid out or developed. Fig. 17 is a top or plan view of the machine shown in Fig. 1. Fig. 18 is a partial section below the line x^5 , Fig. 4. Fig. 19 is a detail showing the lever for effecting the reciprocation of the movable knife-carrying bar and the presser-bar; Fig. 20, a much enlarged sectional detail of the strip-feeding wheels in the line $y y$, Fig. 24; Fig. 21, a sectional detail showing the die-roll and headers and their actuating mechanism. Fig. 22 is a section in the line x^6 , Fig. 21. Fig. 23 is a sectional detail showing the die-roll and the shaft carrying it, together with the ratchet-wheel for imparting a step-by-step movement thereto. Fig. 24 is a sectional detail showing the strip-feeding mechanism. Fig. 25 is a section in the line x^7 , Fig. 23. Fig. 26 is a top or plan view of the parts shown in Fig. 25. Fig. 27 is a detail showing the upper feed-shaft and its cover removed and overturned. Fig. 28 is a section in the line x^8 , Fig. 24. Fig. 29 is a detail showing the brush employed to clear the grooves of the die-roll and the actuating mechanism for said brush. Fig. 30, in elevation, represents part of the stripper to show the slot therein in which the periphery of the die-roll enters in order to strip the tacks or nails from the die-grooves. Fig. 31 is a sectional detail of the said stripper to show the bearing-surface therein to contact with the under sides of the heads of the tacks or nails to positively dislodge the same from the die-grooves. Figs. 32 to 35 show modifications to be described, which may be used when the body of the shank next to the head is to be enlarged.

The framework A is and may be of suitable shape to furnish bearings for the shafts and movable parts to be described.

The main shaft A' , driven by power in any suitable manner, has fast upon it two cam-

hubs A² and B, provided with suitable cam-grooves *a b*, which receive respectively suitable roller or other studs of levers *a' b'*, (shown best in Figs. 17 and 21,) each having its proper fulcrum, as *a² b²*, said fulcrums being herein represented as studs clamped tightly by or through suitable clamp-screws *a³ b³* to the said levers, said studs having suitable bearings in the framework.

The inner ends of the levers *a' b'* are each provided with teeth to engage suitable teeth upon header-carriers *a⁴ b⁴*, fitted to and adapted to slide in guides *a⁵ b⁵* of the framework, each header-carrier being provided with a suitable header, as *a⁶ b⁶*, which at the proper time is made to act upon a tack or nail blank, the large end of which projects slightly from one of the die-grooves in the die-carrier A³, said headers being operated alternately once during each rotation of the main shaft, the shape of the grooves *a b* being shown in Figs. 15 and 16, which represent the cams A² B developed.

The headers have to be adjusted in the header-carrier in order to adapt them to the particular blank and work to be done, and to effect this adjustment the shank of each header is provided with a screw-thread, as *a⁷ or b⁷*, which is screwed into a threaded hole in the header-carrier, a suitable binding-nut, as *a⁸ or b⁸*, holding the headers in their adjusted position.

The inner ends of the header-bars are guided close to the sides of the die-roll A³ in suitable guides *a⁹ b⁹*, (best shown in Fig. 21,) one of said guides being also represented in side elevation and in section in Fig. 5, the face of each of said guides having a channel or pathway 2, (shown in Fig. 5,) having the same curve as the periphery of the die-roll, said channel enabling the large ends of the blanks and the heads made on the blanks after the operation of the headers to travel without friction and yet enable the guides to not only guide the headers but also to act against the sides of the die-roll and steady it in its movements and support it firmly against lateral movement during the strains of heading the blanks.

The machine herein shown is adapted to receive a metallic strip, as A⁵, taken in practice from any suitable reel and of indefinite length, said strip being placed between feeding mechanism, herein shown as a toothed surface *c* on a feed-shaft C, supported in suitable bearings of the framework, said feed-shaft having fast upon it a ratchet-wheel *c'*, which is engaged by a spring-pressed pawl *c²*, (see Fig. 3,) mounted in a pawl-carrier *c⁴*, jointed by a link C' to a lever C², having as its fulcrum a stud C³, suitably held in the framework, the upper end of said lever having a roller or other stud C⁴, which enters a cam-groove C⁵, the shape of which is shown in Fig. 3, cut in one end of the hub B, said pawl *c²* operating intermittently upon the ratchet-wheel *c'* to cause the feeding-surface

c to be moved sufficiently to feed the tack or nail strip the distance desired or required for the nails to be made.

The metal strip A⁵ is kept down upon the feed-surface *c* by a wheel *c⁵*, (shown in section in Fig. 4, and also in Figs. 24 and 27,) said wheel being suitably serrated and being attached to or formed as part of a short shaft *c⁶*, mounted in a suitable curved box *c⁷* held down, so that the surface *c⁵* may act with greater or less force upon the strip, by means of a regulating device *c⁸*, shown as a screw arranged in a suitable threaded bearing *c⁹* and adapted to be readily engaged by the operator to control the pressure as desired. The shaft *c⁶* has at one end a suitable pinion *c¹⁰*, which engages suitable teeth *c¹²*, herein shown as cut into the feed-shaft C, so that the surfaces *c* and *c⁵* rotate in unison.

The contiguous ends of the hubs A² B, have like-shaped cam-grooves *d*, the shapes of which are best shown in Fig. 4, each of said grooves receiving a suitable roller or other stud projected one from each side of an arm *d'* pivoted at *d²*, the end of said arm being curved and provided with suitable teeth, represented at *d³*, which engage teeth of a cross-head D which is firmly clamped by screws *d⁴* to a presser-plunger E, said cross-head also serving as a bearing to receive and sustain a plunger D' and permit said plunger to be oscillated somewhat, as will be described, in said bearing.

Each plunger is adapted to be slid vertically in suitable bearings in the framework.

The plunger D' receives in it a cutter-carrier D² provided at its lower end with the movable cutter 3, to be hereinafter described.

The plunger E serves as a carrier for a presser *e*, the function of which is to co-operate with the die-roll A³ in holding a blank firmly in one of the grooves of the die-roll while the headers before described act to head the blank, and the presser also performs the further function of making the body of the tack or nail conform to the shape of the die-groove by pressing upon the edge of said blank and forcing it firmly into the die-groove.

The presser shown in Fig. 4 has a flattened end, but this invention is not limited to the exact shape shown for the end of said presser next the die-roll, for instead I may, when working with some classes of stock, provide said presser with a roll as represented in the modification, Fig. 32.

The presser *e* is made vertically adjustable in the presser-plunger by means of an adjusting-screw *e'*, and when in adjusted position may be confined at just the proper point by a suitable set-screw *e²*, a lock-nut *e^{2x}* holding the adjusting-screw.

Referring now to the carrier for the movable cutter, said carrier may be adjusted vertically in the plunger D' by a suitable threaded portion *d⁵*. (Shown in Fig. 4.)

Fig. 7 shows the plunger D' detached, and it will be seen that the plunger has attached

to its lower end by suitable screws d^6 a throat-plate d^7 , provided with a suitable guideway for the passage of the tack or nail strip, said throat-plate having arranged above it at a distance equal to the thickness of the strip A^5 a cap-plate 4, (shown in section in Fig. 4, and detached in Fig. 6,) said cap-plate being fitted into a suitable groove at the lower end of the plunger D' .

10 The cap 4 and the throat-plate d^7 form a throat or passage-way covered at top and bottom for the reception of the end of the tack or nail strip, so that said tack or nail strip is carried up and down with the said plunger in said throat, the strip springing between the throat and the feeding-surfaces.

The lower end of the movable cutter 3 stands normally substantially level with the under side of the cap-plate 4, and the rear side of the cutter-blade enters the notch 4^x , (shown in Fig. 6 in the said plate,) and as the plunger D' is raised and lowered the acting-end of the movable cutter occupies the position substantially as shown in Fig. 4.

25 The tack or nail strip is severed transversely between two cutter members—viz., the movable cutting-blade 3 and the stationary, yet adjustable, blade 5, shown as acted upon at its lower end by a screw-threaded rod F , made vertically adjustable in a suitable spindle F' having suitable bearings at f in parts of the framework, so that said spindle may be oscillated in unison with the plunger D' and movable cutter 3.

35 Immediately above the stationary cutter 5 is a guide-plate 6, attached to or forming a part of the spindle F' , said plate having attached arms or legs 6^x , one of which is shown at Fig. 9 fitted into grooves in the sides of the spindle F' , a ring-rail 30 engaging the said legs and holding the guide in place.

The guide 6 (see Fig. 4) bears against the rear side of the cutter 3 and sufficiently above the stationary cutter 5 to leave a blank-receiving throat 7 in line with the strip-receiving throat of the throat-plate d^7 .

When the strip-throat is in line with the nail-blank throat 7, the feeding device will force the leading end of the strip from the strip-throat into the nail-throat for a distance equal to the width of the center of the nail-blank to be made, and the plunger D' , together with the strip-throat and the movable cutter 3, will then be depressed, causing the tack or nail-strip to be severed transversely between one corner of the movable and the contiguous corner of the stationary cutter, leaving a tack or nail blank in the blank-throat.

50 The blank-throat between the cutter 3 and the die-roll may be of greater or less width, according to the number of tack or nail blanks it is desired to retain in said throat, the thickness of the throat being such, however, as to prevent one blank overriding another, and consequently the endmost blank of the series of blanks at each movement of

the nail-strip into the strip-throat will be pressed toward the periphery of the die-roll, and said blanks will enter the die-grooves therein one after the other as the said die-grooves arrive opposite the tack or nail throat, and said blanks will be taken away from said throat by the die-roll.

The die-roll has, it will be seen best in Figs. 11 to 13, a series of die-grooves of peculiar shape—that is, they are of varying depth from one to the other edge of the die-roll—and the die-grooves alternate, the deep end of one groove lying at one edge of the die-roll and the deep end of the next groove at the opposite edge of the die-roll, this being done because in this present instance of my invention my machine is adapted for making tacks or nails with tapering shanks, and the blanks to form said shanks are cut off from the strip diagonally with relation thereto.

The difference in the depth of these die-grooves, as compared with one and the other edge of the die-roll, may vary according to the taper desired for the tack or nail to be made, and, in fact, it will be understood that whatever form is given to the die-grooves in the die-roll will determine the shape of the body of the tack or nail both longitudinally and in cross-section.

The thickness of the die-roll may be more or less, according to the length of the tack or nail to be made, and the difference between the thickness of the die-roll and the width of the throat receiving the strip to be made into tacks or nails may be more or less, according to the size desired for the head of the tack or nail, for the greater this difference the greater the distance the head end of the blank will project from the groove in the die-roll.

Fig. 8, in section, shows the plunger D' with the movable cutter 3 and the clamp-screw 8 used to clamp it in place after it has been adjusted into its place by the screw d^5 .

Fig. 14 shows the spindle F' in section, together with the stationary blade 5 and the clamping-screw 9 for holding it in position.

The die-roll A^8 must be moved at just the proper speed with relation to the strip-feeding and cutting mechanism, and at the same times, and to insure this the lever C' is herein shown as provided with a suitable pawl C^6 , which engages the teeth of a ratchet-wheel C^7 fast on the die-roll shaft C^8 , and to prevent the movement of said shaft overrunning I provide to co-operate with said ratchet-wheel a suitable friction device or brake C^9 , and for greater safety I have also provided a locking device or detent 10, which is also mounted upon the link C' and made adjustable on or with relation to said link by means of a suitable adjusting device, shown as a screw 12.

As has been stated, the tack or nail strip is cut diagonally so as to form nail-blanks tapering in shape, and to effect this it is ob-

vious that either the tack or nail strip or the cutting mechanism for severing the strip must be oscillated.

I have provided novel means for oscillating the plunger D' carrying the movable cutter and the throat referred to, and also the spindle F' carrying the stationary cutter and the nail-throat. The mechanism referred to consists essentially of two suitable arms g g' , each clamped in suitable manner, the one to the plunger D' and the other to the sleeve F', each being loosely jointed at its outer end with a suitable upright g^2 held in suitable bearings g^3 at one end of an adjustable frame g^4 , said frame having, as herein shown, at or near one end a bearing g^5 , (see Fig. 17,) to receive and have clamped therein an arm g^6 provided with a collar g^7 , which is fitted about a sleeve g^8 mounted upon a stud g^9 held in an adjustable manner in a slot in the upper end of a lever g^{10} having as its fulcrum the rod C³, before described, said lever g^{10} having a suitable roller or other stud g^{12} , (represented by dotted lines in Fig. 2,) entering a suitable cam-groove g^{13} made in the left-hand end, viewing Fig. 17, of the cam-hub A². As the main shaft is rotated, the cam-groove g^{13} causes the lever g^{10} in its reciprocation to move the frame g^4 backward and forward, so that said frame carrying the rod g^2 causes the arms g g' to rock the plunger D' and the spindle F' carrying the said movable and stationary cutter and throat, to place the said cutters at one and then at an opposite inclination with relation to the longitudinal center of the strip, so as to cut blanks from the ends of said strip, tapering one in one direction and the next in the opposite direction.

In order to provide for differing nail-blanks, I may adjust the stud g^9 in the slot of the lever g^{10} . The nearer the said stud to the center of motion of the said lever the less the taper of the nail, and vice versa.

When the stud is adjusted up or down in the slot referred to, the entire frame g^4 moves with it, said frame sliding on the rod g^2 .

Inasmuch as the plunger D', to which the arm g is clamped, rises and falls, I have slotted the outer end of the arm g , so that it embraces a suitable block g^x mounted loosely upon the end of the rod g^2 , said loose block being of sufficient depth to act as a guide for and let the arm g' slide up and down on it.

To insure the discharge of the headed tacks or nails from the die-grooves, I have provided a clearer, shown in this instance of my invention as a brush h , (see Figs. 4, 17 and 29,) carried by a suitable sliding rod h' connected to a suitable actuating-lever h^2 and adapted to be reciprocated back and forth with relation to the die-grooves, said rod being provided with a pivot-pin h^x , mounted in a tube h^3 fitted to slide back and forth in a hole in the framework, the lever h^2 (shown best in Fig. 17) having its pivot at 12 on a suitable stud, and being connected by a suitable link, as 13, to the lever a' , before described.

It will be understood that the heads of the tacks or nails, having been properly formed or shaped, will project from the sides of the die-roll, and to enable them to be properly removed from the die-grooves I have arranged a stripper, herein shown as a tube m , into a slot m' in which the periphery of the die-roll travels, the edges of said tube, contiguous to the sides of the die-roll, being preferably somewhat thinned or reduced, as at m^2 , so as to properly engage the heads of the tacks or nails at their sides nearest the center of motion of the die-roll, the slot in the stripper being of such shape as to permit the tacks protruding from the die-roll to enter the stripper, but as the die-roll passes out of the stripper, the latter, acting on the head of the tack, pulls it out of the die-groove and permits it to fall into and through the tube m .

As the cutters 3 and 5 wear, they have to be adjusted so that their working edges will come exactly in proper position one with relation to the other, and to provide for this, the bearings f^x , which are yoked together, for the sleeve F', are mounted upon the framework in an adjustable manner. The lowermost of said bearings has an ear 18^x, which is slotted, (see Fig. 4,) and is entered by a set-screw 18, and to adjust the yoke the upper bearing has entering it an adjusting device, shown as a hollow externally-threaded nut 16 entered by an adjusting-screw 17.

Fig. 23 shows the manner of fastening the die-roll upon its shaft C⁸, and in said figure it will be seen that the hole through the center of the die-roll is tapering and is adapted to receive a tapering portion 118 on the said shaft C⁸, the said tapering portion being drawn into the tapering hole at the center of the die-roll with greater or less force, by means of a suitable nut 19, screwed upon the end of the die-roll, said nut acting upon one end of a sleeve 20 interposed between said shaft C⁸ and the bearing therefor in the framework A. The tapering surface 118 has a suitable key 118^x, which in practice enters a suitable key-slot in the hole in the hub of the die-roll.

It is essential in the operation of this machine that the grooves in the die-roll occupy exactly the proper position with relation to the headers, &c., and to insure this the ratchet-wheel C⁷ is attached to the shaft C⁸ in an adjustable manner.

Viewing Fig. 25, it will be seen that the hub of the ratchet-wheel C⁷ is provided with suitable lugs 22, which receive suitable adjusting devices, shown as screws 23, and the shaft C⁸ is shown as provided with a lug 24, and by moving the adjusting devices or screws 23 in the proper directions, the said ratchet-wheel may be fixed to the die-roll shaft in exactly the proper position to insure the bringing of the grooves of the die-roll at exactly the proper point when the die-roll is at rest during the heading operation. This adjustment enables the head to be made exactly central and uniform with relation to

the body of the tack, and also—which is of the utmost importance—enables the die-grooves to be left exactly opposite the blank-throat, in order that the blank for a nail may go directly from the said throat into a die-groove.

If it is desired to make a nail having a conical or other enlargement at the under side of its head, vanishing into the shank of the nail, the presser may have formed in its lower end a suitable recess to conform to one-half of the taper desired to be given to the nail at the under side of the head, and for this particular work, or to make a nail such as shown in the outline, Fig. 35, I prefer to slightly modify the shape of the die-roll, as represented in Figs. 32 to 35, wherein the die-grooves are supposed to be made a little deeper than the width of the blank, and the edges of the die-roll are then turned down or cut away sufficiently (see Figs. 33 and 35) to leave a slight annular projection or enlargement central with relation to the periphery of the die-roll, and the presser co-operating therewith will be made as a roll and grooved annularly to embrace said enlargement containing the die-groove.

The little annular rims or projections left at the edges of the presser and overlapping the edges of the enlargement are provided with concavities of the shape desired for one-half of the nail at the under side of the head, and the shoulders o' left by turning down the die-roll are provided with other conical concavities o^2 , so that when the headers act they will cause the metal of the blank to fill not only the groove in the die-roll, but also the concavities o and o^2 referred to, in the presser and die-roll, respectively, as shown in Figs. 33, 34 and 35.

The nail-strip has its end entered in the machine, and to insure the stopping of the machine in case the nail-strip becomes exhausted I have provided the machine with a feeler n , shown as an arm or lever, pivoted at n' , and having a suitable catch n^2 , which engages a suitable projection on an arm of a shipper-lever n^3 , pivoted at n^4 , and having jointed to it, as herein shown, a clutch-controller n^5 , made as a short wedge which co-operates with a collar n^6 and forces it against the continuously-running pulley n^7 having a conical or tapering face, causing said pulley to engage the pulley n^8 , fast upon the main shaft and rotate the same. This clutch-pulley mechanism and the wedge n^5 are of usual construction.

When the tack or nail strip becomes exhausted, the feeler n drops, releasing the shipper-lever n^3 , effecting the stopping of the machine.

To insure the correct bottoming of the edge of a tack or nail blank in the bottom of the die-groove throughout, the blank must be subjected to equal pressure from end to end, and this can be best done only when the acting end of the strip is permitted to press

equally from edge to edge against the blank or series of blanks ahead of it, and to insure this I have so arranged the feed mechanism for the strip that it will operate to feed the strip and to push a blank or blanks ahead of it from the blank-throat into the die-grooves of the die-roll only when the knives of the cutters stand at right angles to the center line of the strip.

I have accordingly divided the swinging or oscillating motion of the strip-throat and the blank-throat and the cutters, so that each complete movement is divided into two steps—as, for instance, when the cutters and throat occupy a position at one angle, they are brought to rest before occupying the position at the opposite angle, with both cutters at right angles to the strip, and at this time while the oscillation of the plunger D' and the sleeve R' are temporarily stopped the feed takes place.

The portions of the cam-groove g^{13} between the points z and z' , Fig. 2, provide for this rest of the oscillation of the plunger D' during the feeding motion of the strip.

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

1. In a tack or nail-making machine, the following instrumentalities, viz:—a die-roll having a series of parallel sided die-grooves of varying depth from end to end, the deeper or head ends being alternated with point ends of less depth, a presser device to keep the tack or nail-blanks in said die-grooves, strip-feeding mechanism, strip-cutting mechanism, and devices to oscillate the strip-cutting mechanism, to operate, substantially as described.

2. In a tack or nail-making machine, the following instrumentalities, viz:—a die-roll having a series of parallel sided die-grooves of varying depth from end to end, the deeper or head ends being alternated with point ends of less depth, a presser device to keep the tack or nail-blanks in said die-grooves, head forming devices, strip-feeding mechanism, strip-cutting mechanism, and devices to oscillate the strip-cutting mechanism, to operate, substantially as described.

3. A die-roll having parallel sided die-grooves tapered alternately in their bottoms in opposite direction to receive the edges of a series of tapering nail blanks, a presser to act on the opposite edges of said tapering blanks to keep the same in the said grooves, a strip-throat to receive the nail strip, a blank-throat, cutting-mechanism arranged between the said throats and means to actuate the cutting-mechanism, combined with strip feeding mechanism adapted to feed the strip into the strip-throat and cause the end of the strip to act on a cut blank and feed it through the blank-throat and force the edge of the nail-blanks in succession into the said die-grooves, substantially as described.

4. The die-roll having die-grooves to receive tapering blanks, a strip-receiving throat,

a blank-receiving throat, and strip-cutting mechanism arranged between said throats, combined with devices to oscillate said throats and cutting-mechanism, and means to adjust the extent of said oscillation according to the taper desired for the tack or nail-blank, substantially as described.

5. The die-roll, the reciprocable cross-head, and the presser carried by said cross-head, and movable therewith, combined with a plunger adapted to oscillate in its bearings in said cross-head, and reciprocated by the latter, and a cutter carrier and cutter mounted in said plunger, substantially as described.

6. The strip-feeding mechanism comprehending shaft C having toothed surfaces c and c^{12} , and the shaft c^6 , having toothed surfaces c and c^{10} , combined with the cover c^7 for said shaft, and the adjusting rod c^8 to keep said cover down to its work, substantially as described.

7. The die-roll, strip-throat, and cutting-mechanism, and devices to oscillate said cutting-mechanism and throat, combined with strip-feeding mechanism, a feeler to bear on the strip, and stop-mechanism controlled by the position of said feeler, substantially as described.

8. In a tack or nail-making machine, the following instrumentalities, viz:—a die roll having a series of die grooves, a strip feeding mechanism, cutting mechanism for the strip, and a blank-receiving throat movable therewith, combined with devices to oscillate said cutting mechanism and blank-receiving throat, and also to position them at right angles to the direction of feed, and to hold them at rest temporarily while the feeding mechanism operates to move the strip forward prior to the action of the cutting mechanism in severing a blank, to thereby feed a previously severed blank in proper position to the die roll, substantially as described.

9. In a nail or tack making machine, the following instrumentalities, viz:—a die-roll having a series of die-grooves of varying depth from end to end, the deeper ends being alternated and enlarged to form one half of the head of a nail, combined with a pressure device to act upon the tapering edge of the blank extended from the groove of the die-roll, said pressure device having a notch as o to form one half of the head of a nail, substantially as described.

10. In a tack or nail-making machine, the following instrumentalities, viz:—means to

support a strip, cutting-mechanism to sever the strip, and a die-roll having die-grooves to receive a nail blank severed from the end of the strip, combined with a ratchet toothed pulley attached to the shaft carrying the die-roll, and with means to adjust the position of said ratchet-toothed pulley upon said shaft to enable the die-grooves to be brought into proper position to receive directly the nail-blanks, substantially as described.

11. The die-roll having die-grooves, the plunger provided with a presser to co-operate with said die-roll, a block connected with said plunger having a bearing, a plunger mounted loosely in said bearing and provided with a cutter, combined with means for guiding a nail-strip, means for moving said block to raise and lower the plungers together, and means to oscillate the plunger D' in the bearing in said block, substantially as described.

12. The plunger D', provided with the throat-plate d^7 having a groove, and a cap-plate 4, combined with a stationary cutter 5, and means to clamp the cutter in adjusted position with relation to the said throat-plate and cap-plate, substantially as described.

13. The die-roll having the die-grooves, combined with a reciprocating brush, a guide therefor, and means to actuate the brush to sweep the headless nails from the die-grooves, substantially as described.

14. A die roll having die grooves, combined with a tubular stripper, slotted to receive the die roll, and having edges to pass between the head of the nail and the center of rotation of the die roll to discharge the nails from the die roll into the stripper, substantially as described.

15. The spindle F', and the plate 6 having arms 6^x , combined with means co-operating with and holding said arms, and the stationary cutter-blade 5, and means to hold it in place, substantially as described.

16. The spindle F', the stationary cutter clamped therein, and bearings to contain said spindle, combined with the strip-throat, and means to adjust the bearings of the spindle F' with relation to the strip-throat, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS GODDU.

Witnesses:

JOHN C. EDWARDS,
FREDERICK L. EMERY.