

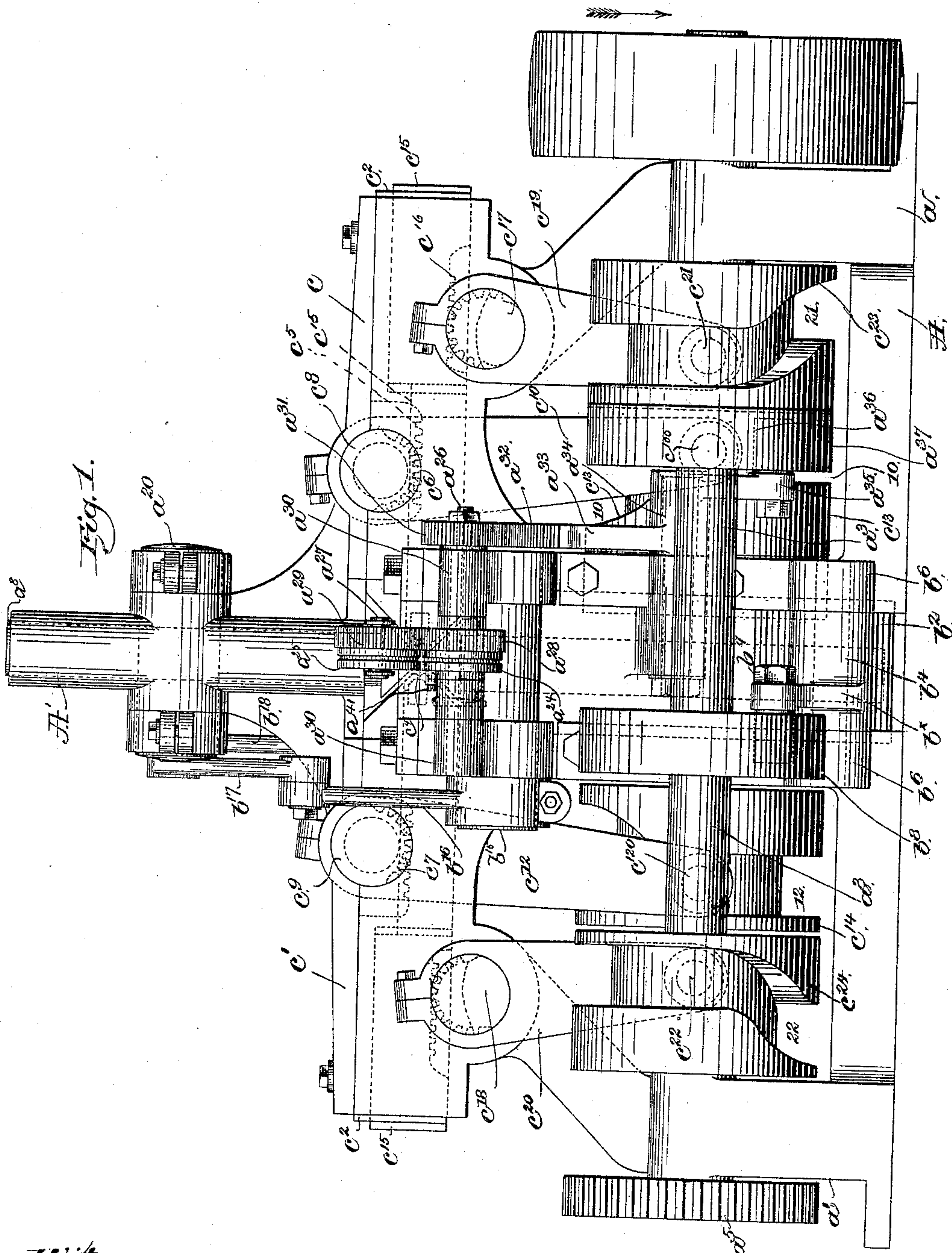
(No Model.)

4 Sheets—Sheet 1.

L. GODDU.
NAIL MAKING MACHINE.

No. 443,077.

Patented Dec. 16, 1890.



Witnesses
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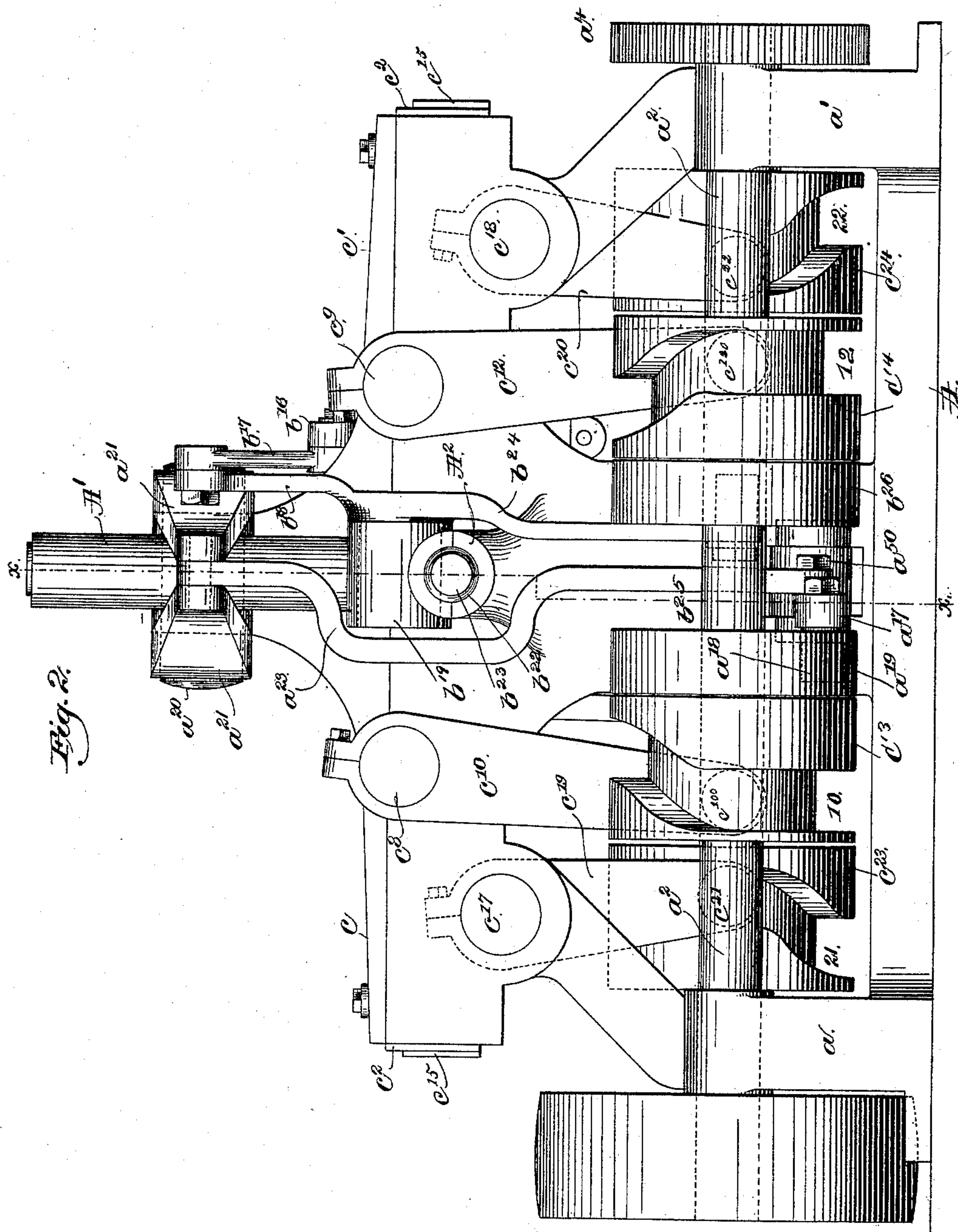
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NAIL MAKING MACHINE.

No. 443,077.

Patented Dec. 16, 1890.



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4 Sheets—Sheet 3.

No. 443,077.

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Fig. 3.

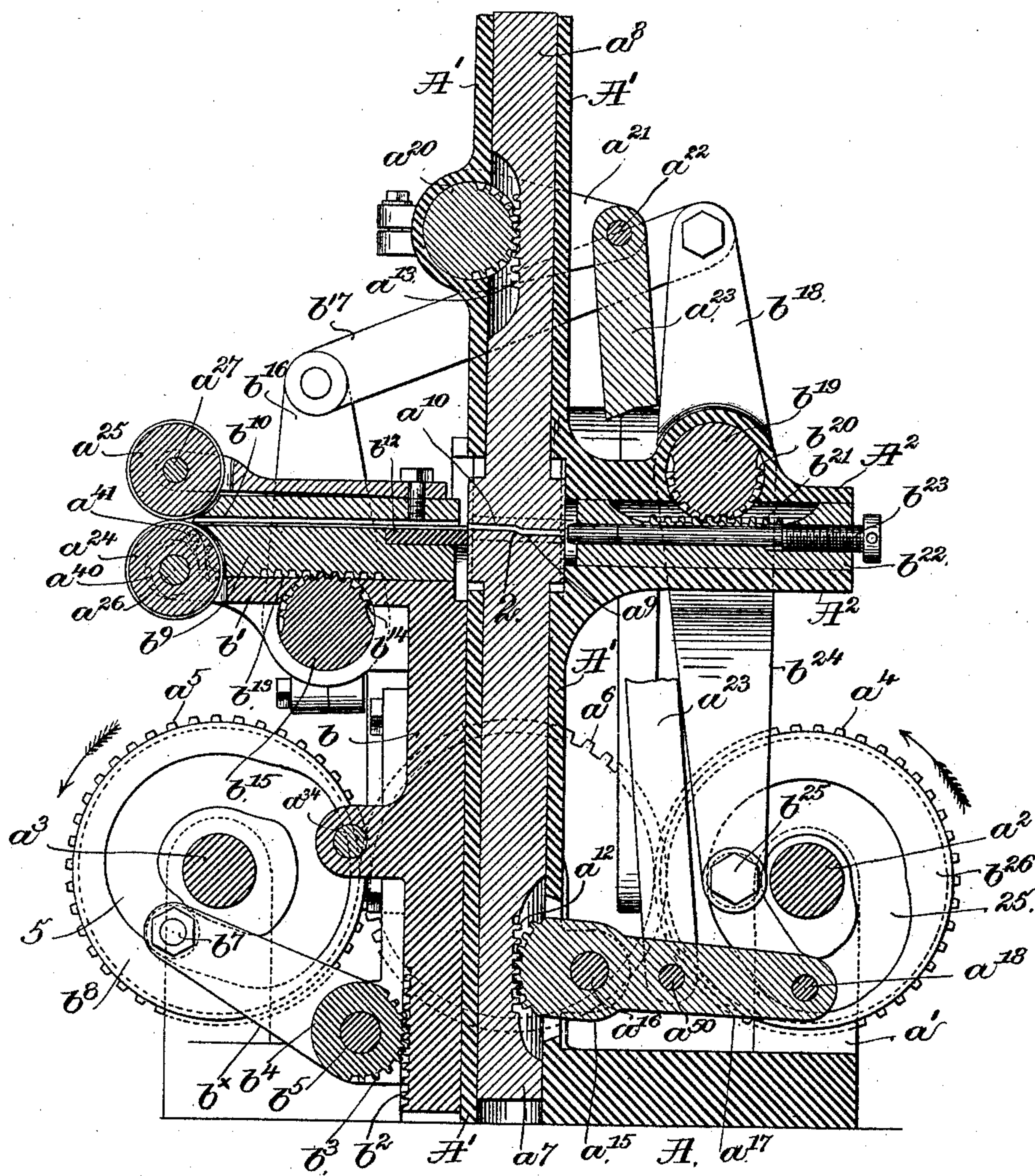
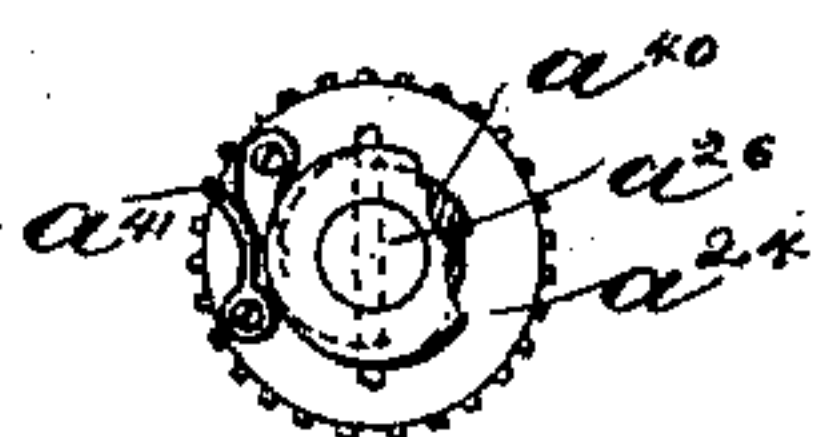


Fig. 9.

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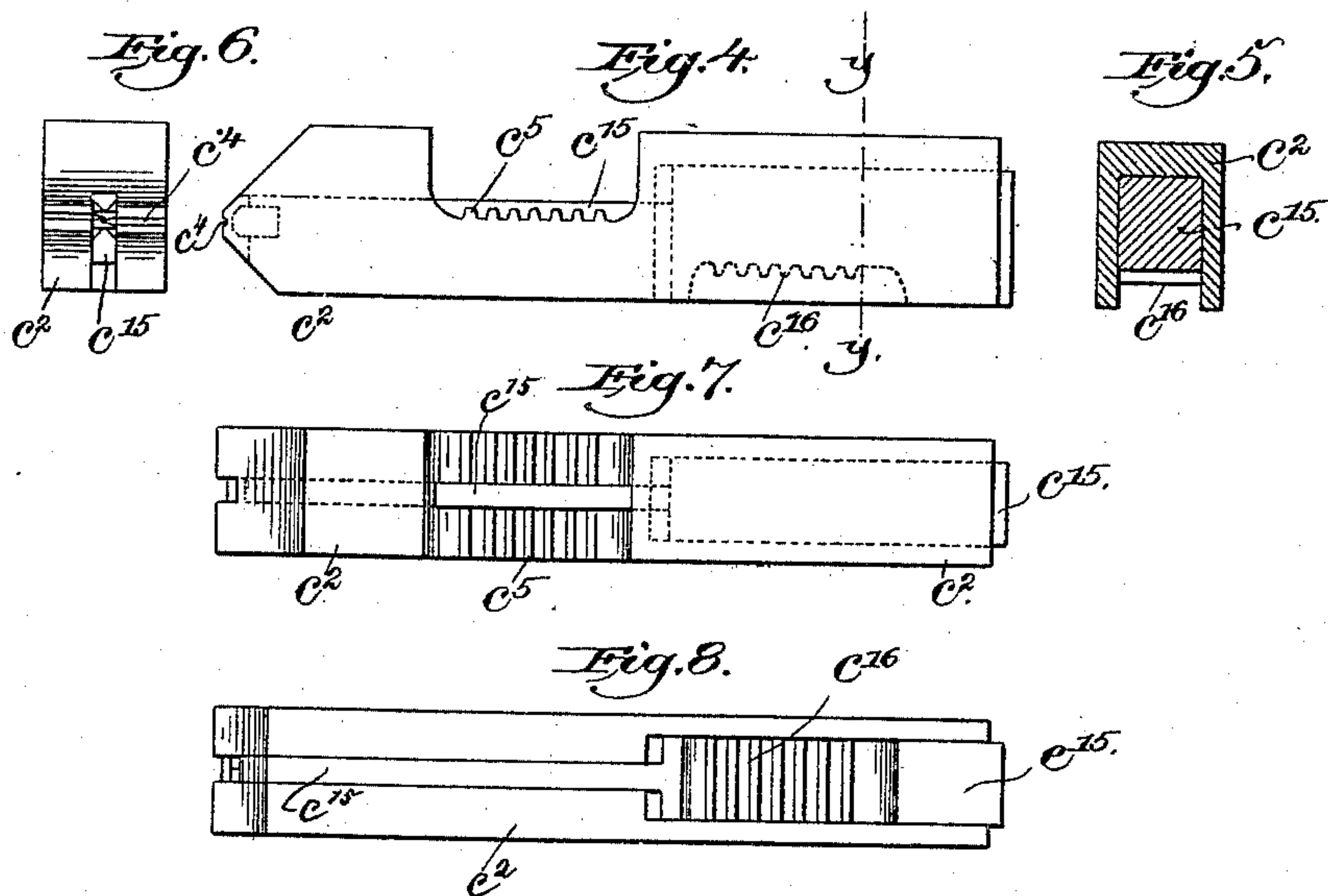
(No Model.)

4 Sheets—Sheet 4.

L. GODDU.
NAIL MAKING MACHINE.

No. 443,077.

Patented Dec. 16, 1890.



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UNITED STATES PATENT OFFICE.

LOUIS GODDU, OF WINCHESTER, ASSIGNOR TO JAMES W. BROOKS, PRINCIPAL TRUSTEE, OF CAMBRIDGE, AND FRANK F. STANLEY, ASSOCIATE TRUSTEE, OF SWAMPSCOTT, MASSACHUSETTS.

NAIL-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 443,077, dated December 16, 1890.

Application filed April 10, 1890. Serial No. 347,310. (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 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.

10 This invention relates to nail-making machines of that class in which the nails are made from a continuous wire, and has for its object to improve the construction of the class of machines referred to.

15 My improved machine is especially adapted to be used in the manufacture, from a continuous wire, of nails for boots and shoes.

In accordance with my present invention the wire is preferably first fed between holding jaws or dies, which are preferably so shaped as to constitute bending-dies and form a diagonal bend near the center of that portion of the wire gripped by the jaws, and thereafter the portion of the wire gripped between the bending-jaws is severed by a suitable cutter or shear to form a blank. The blank thus formed is preferably next seized by gripping-dies reciprocating substantially at right angles to the bending-jaws, and when firmly grasped by the gripping-dies the ends of the blank may then be upset to form a head, and the said blank severed at its center, preferably, by independent cutting and pointing dies, which cut across the diagonal bend of the wire and thus form the point without waste of stock. The gripping-dies, still holding the nails, are then preferably moved out of line with the bending-dies and opened to permit the nails to drop into a suitable receptacle, after which the gripping-dies are restored to their normal operative position.

45 My invention in a nail-making machine therefore consists in the combination of the following instrumentalities, viz: a wire-feeding mechanism to feed the wire, reciprocating holding-jaws, a cutter to sever a portion of the wire grasped by the holding-jaws and

form a blank, reciprocating gripping-dies and independent cutting or pointing dies to sever 50 the blank and form the nails, and means to reciprocate the said parts, substantially as will be described.

Other features of my invention will be pointed out in the claims at the end of this 55 specification.

Figure 1 is an elevation of the feed end of a nail-making machine embodying my invention; Fig. 2, a rear end elevation of the machine shown in Fig. 1; Fig. 3, a section of the machine on the irregular line $x x$, Fig. 2, looking toward the right; Fig. 4, a side elevation of one of the gripping and pointing dies shown separately; Fig. 5, a cross-section on the line $y y$, Fig. 4; Fig. 6, an end view of the dies shown in Fig. 4, looking toward the right; Fig. 7, a top or plan view of the dies shown in Fig. 4; Fig. 8, an under side view of the same, and Fig. 9 a detail to more clearly show the wire-feed mechanism. 70

The frame-work of the machine, of metal or other material possessing the requisite strength to sustain the working parts, consists, as herein shown, of a base A, having secured to or forming part of it, as herein 75 shown, a preferably cylindrical vertical upright A', having extended from it substantially near its longitudinal center a horizontal cylindrical arm A².

The base A at its opposite ends has secured 80 to or forming part of it two sets of pillow-blocks $a a'$, forming journal bearings or shafts $a^2 a^3$, constituting the main shafts of the machine. The main shafts $a^2 a^3$ are connected to rotate in unison, as herein shown, 85 by gears $a^4 a^5$ on the said shafts in mesh with an intermediate gear a^6 , having its shaft supported in any usual manner by the frame-work of the machine.

The vertical upright A' forms a guideway 90 for oppositely-reciprocating bars $a^7 a^8$, having their contiguous or adjacent ends shaped to form holding and preferably bending jaws or dies $a^9 a^{10}$, which are preferably so shaped as to form a diagonal bend near their center, as 95 at 2, Fig. 3. The bending-bars $a^7 a^8$, as herein

shown, are reduced or cut away in cross-section near their outer ends, and are provided at said reduced portions with rack-teeth a^{12} a^{13} . The rack-teeth a^{12} are engaged by gear-teeth on a segmental lever a^{15} , pivoted on a stud or shaft a^{16} , supported by the frame-work, the said lever having its long arm a^{17} provided with a stud a^{18} to enter a cam-groove on one face of a disk or hub a^{19} , mounted on the shaft a^2 . The rack-teeth a^{13} on the bending-bar a^8 are engaged by the gear-teeth on a hub a^{20} , having fastened to its opposite ends, as shown in Fig. 2, arms a^{21} , extended toward the rear of the machine and having secured to them, as by pin a^{22} , one end of a link a^{23} , having its other end fastened to the arm a^{17} of the segmental lever a^{15} , as by pin a^{24} . The cam-groove in the hub a^{19} will in practice be made of suitable shape to produce opposite reciprocations of the bending-bars at the proper time, so as to grasp and bend the wire fed between them by a suitable feed mechanism. (Shown as feed-rollers a^{24} a^{25} .) The feed-rollers a^{24} a^{25} are mounted on shafts a^{26} a^{27} , provided with gears a^{28} a^{29} , in mesh with each other, the gear a^{28} , as herein shown, constituting the driving-gear for the gear a^{29} . The shaft a^{26} is supported by suitable bearings a^{30} , and the said shaft has mounted on it a gear or pinion a^{31} , in mesh with and driven by a segmental gear a^{32} on an arm a^{33} , secured to or forming part of a rock-shaft a^{34} , (see dotted lines, Fig. 1,) the said rock-shaft having a second arm a^{35} , provided with a stud or roller a^{36} , extended into a cam-groove in a disk a^{37} on the shaft a^3 , the said cam-groove being suitably shaped to produce movement of the rock-shaft a^{34} and rotation of the feed-rollers to feed forward the proper length of wire. The feed-roll a^{24} has secured to it a ratchet-wheel a^{40} , (see Fig. 9, and dotted lines, Fig. 3,) and the shaft a^{26} has mounted on it a disk to which is pivoted a pawl a^{41} , which engages the ratchet-wheel and moves the feed-roll on one oscillation of the shaft a^{26} and slips over the ratchet-wheel on the oscillation of the shaft a^{26} in the opposite direction, as usual in nail-making machines.

The lower portion of the upright A' forms part of a guideway for a bar b , having, as shown, an arm b' , extended substantially at right angles from said bar, the latter being provided at its lower end with rack-teeth b^2 , with which mesh teeth b^3 on a hub b^4 , having an arm b^5 , and mounted on a stud or shaft b^6 , (see Fig. 1) of the frame-work. The arm b^5 is provided with a stud b^7 , extended into a cam-groove in one face of a disk or hub b^8 , fast on the shaft a^3 . The arm b' of the bar b supports a feed-wire carrier, herein shown as a bar b^9 , provided with a longitudinal passage-way b^{10} for the wire, and, as herein shown, the said bar has fitted into it at its inner end a metal piece or plate b^{12} , having its inner end, as shown, substantially in contact with the side

of the bending-bar a^7 , the said plate, as herein shown, constituting a combined shear and header, as will be described.

The bar b^9 is provided with rack-teeth b^{13} , with which mesh gear-teeth b^{14} on a hub b^{15} , provided with an arm b^{16} , the said hub being suitably supported by the frame-work and having its arm b^{16} extended upward and connected by a link b^{17} to the arm b^{18} of a like hub b^{19} , provided with gear-teeth b^{20} , in mesh with rack-teeth b^{21} on a bar b^{23} , provided, as herein shown, with a longitudinal opening through which is extended a screw b^{22} to form a header, as will be described.

The hub b^{19} has a long arm b^{24} , provided with a stud or pin b^{25} , extended into a cam-groove 25 in one face of a disk or hub b^{26} on the shaft a^2 , the said cam-groove being suitably shaped to produce reciprocations of the bars b^9 b^{22} in opposite directions, for a purpose which will be described.

The upright A' has arms c c' , extended, as herein shown, substantially at right angles to the arm A^2 , (see Fig. 2,) the said arms c c' constituting guideways for reciprocating gripping-dies c^2 , by which the wire between the bending-dies may be held in position to be cut and pointed after the bending-dies have been withdrawn from and have released the wire.

Each gripping-die c^2 is herein shown as a bar provided with a tapering or conically-pointed nose or end grooved, as at c^4 , (see Fig. 6,) to conform to the shape of the bent portion of the wire, and the grooves c^4 of the gripping-dies are out of line with one another to fit the bent portions of the blank.

The gripping-die c^2 , as herein shown, is cut away or reduced in cross-section and provided with rack-teeth c^5 , with which mesh gear-teeth c^6 c^7 on hubs c^8 c^9 , (see Fig. 1,) the said hubs having arms c^{10} c^{12} , being provided with studs or pins c^{100} c^{120} , extended in cam-shaped grooves 10 12 on the periphery of hubs or disks c^{13} c^{14} , (see Fig. 2,) mounted on the shaft a^2 .

The gripping-dies c^2 are made substantially rectangular in cross-section, as shown in Fig. 5, and receive within them a pointing or cutting die, herein shown as a bar c^{15} , thickened at its rear portion and provided with rack-teeth c^{16} . The rack-teeth c^{16} of the pointing-dies are engaged by the gear-teeth on hubs c^{17} c^{18} , having arms c^{19} c^{20} , provided at their ends with studs or rollers c^{21} c^{22} , extended into the cam-grooves 21 22 on the peripheries of hubs or disks c^{23} c^{24} , mounted on the shaft a^3 , the said cam-grooves being of suitable shape to produce opposite reciprocations of the pointing-die independent of the gripping-die, for a purpose as will be described.

In the operation of the machine the wire is fed forward intermittingly through the guideway b^{10} , and when a sufficient length of wire has been fed between and in line with the bending-dies a^9 a^{10} the latter are moved forward by the levers a^{15} a^{21} , joined by the connecting-lever a^{23} , and the wire is grasped be-

tween the said dies and bent at its center portion. The feed of the wire then ceases and the bar *b* is then raised through the toothed hub *b*¹, acting on the gear-teeth *b*², and the edge of the bar *b*¹² acts as a shear or cutter to sever the bent portion of the wire from the coil or continuous strip, and thus form a blank from which the nails are produced, the said blank at such time being firmly held by the bending-dies. The bending-dies are then reciprocated in the opposite direction, and at the same time the gripping-dies *c*², by means of the toothed hubs *c*⁸ *c*⁹, are moved forward substantially at right angles to the bending-dies, so that the said gripping-dies will grasp the blank between them as it is released by the bending-dies. The gripping-dies are preferably made not quite as wide as the bending-dies, so that when the wire blank is grasped between the gripping-dies a sufficient portion of the wire projects from each side to form the head of the nail. As soon as the gripping-dies have been moved forward to grasp the nail-blank the pointing-dies are moved forward by the levers *c*¹⁹ *c*²⁰, and the blank is severed at the bent portion, so as to form the point of the nail without waste of stock. Just before or at the same time or immediately after the bending-dies have severed the wire blank the bars *b*²² *b*⁹ are reciprocated to head the severed blank by means of their levers *b*²⁴ *b*¹⁶ and link *b*¹⁷, connecting said levers, the cutter-bar *b*¹², as herein shown, forming one of the said headers. The wire blank has at this time been formed into two complete nails, and in order that they may be deposited into a suitable receptacle the gripping-dies which still hold the said nails may by the cam-grooves 10 12 in the disks or hubs *c*¹³ *c*¹⁴ be moved in either direction to one side of the bending-dies, the said grooves being given the desired shape to effect this result, so as to clear the said dies, and when thus cleared the said gripping-dies may be opened to discharge the nails into a

receptacle, and thereafter the said dies may be moved back into their normal position ready to grasp a second blank, as above described.

I claim—

1. In a nail-making machine, the combination of the following instrumentalities, viz: a wire-feeding mechanism to feed the wire, reciprocating holding-jaws, a cutter to sever a portion of the wire grasped by the holding-jaws and form a blank, reciprocating gripping-dies and independent cutting or pointing dies to sever the blank and form the nails, and means to reciprocate the said parts, substantially as described.

2. In a nail-making machine, the combination, with a wire-feeding mechanism, of reciprocating holding and bending jaws or dies, a shear or cutter to sever the wire grasped by the bending-jaws to form a blank, independent reciprocating gripping-dies substantially at right angles to the holding-jaws to hold the blank, headers to act on the opposite ends of the blank, and independent cutting or pointing dies to sever the blank, and means to reciprocate said parts, substantially as described.

3. In a nail-making machine, the combination of the following instrumentalities, viz: a wire-feeding mechanism to feed the wire, reciprocating holding-jaws, a cutter to sever the wire grasped by the holding-jaws to form a blank, reciprocating gripping-dies having grooves out of line with each other to fit the bent portions of the blank, and independent cutting or pointing dies to sever the blank and form the nails, and means to reciprocate the said parts, substantially as described.

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

LOUIS GODDU.

Witnesses:

JAS. H. CHURCHILL,
FREDERICK L. EMERY.