

(No Model.)

2 Sheets—Sheet 1

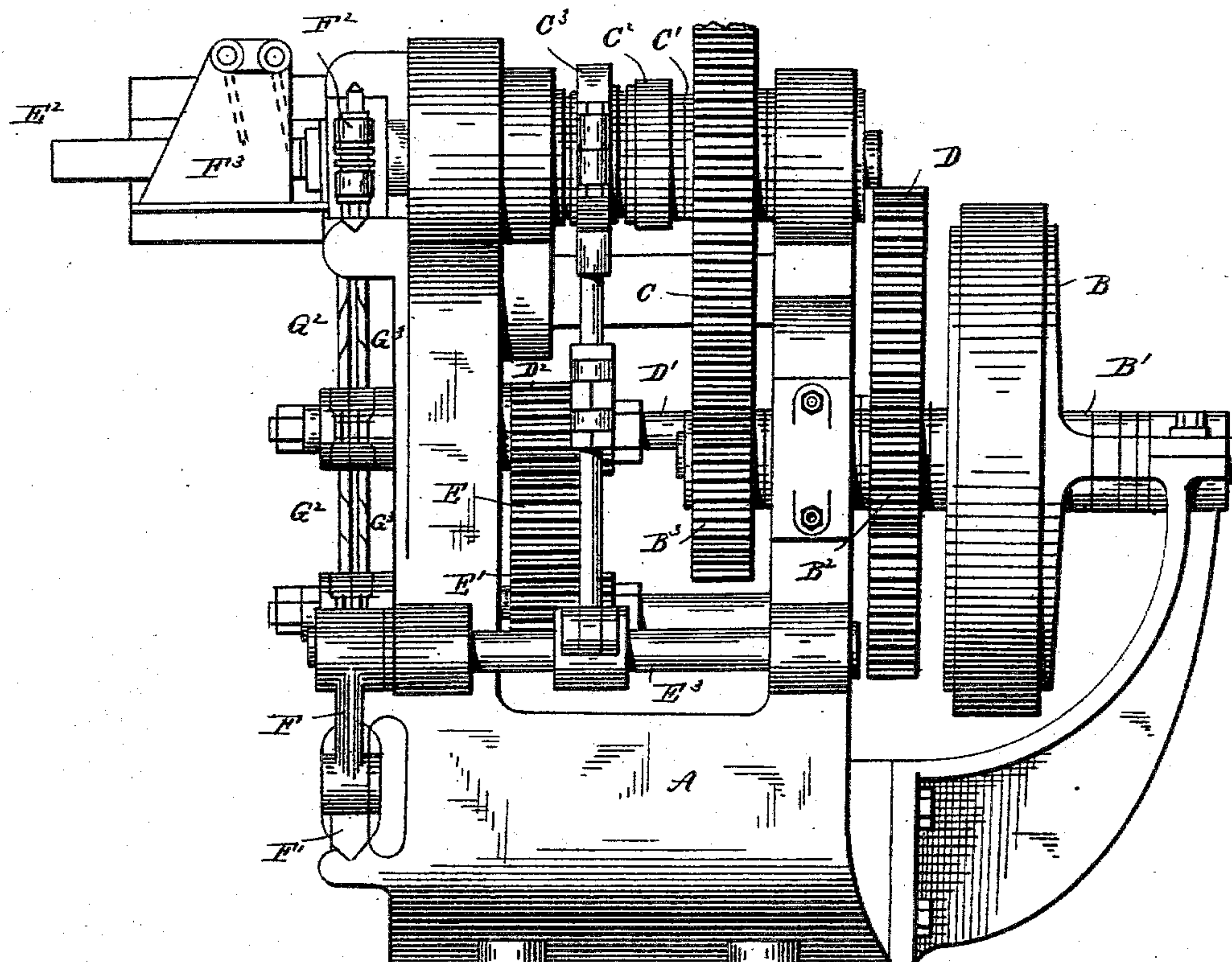
J. A. COLEMAN.

MACHINE FOR MAKING HORSESHOE NAILS.

No. 286,390.

Patented Oct. 9, 1883.

Fig. 1.



Witnesses.

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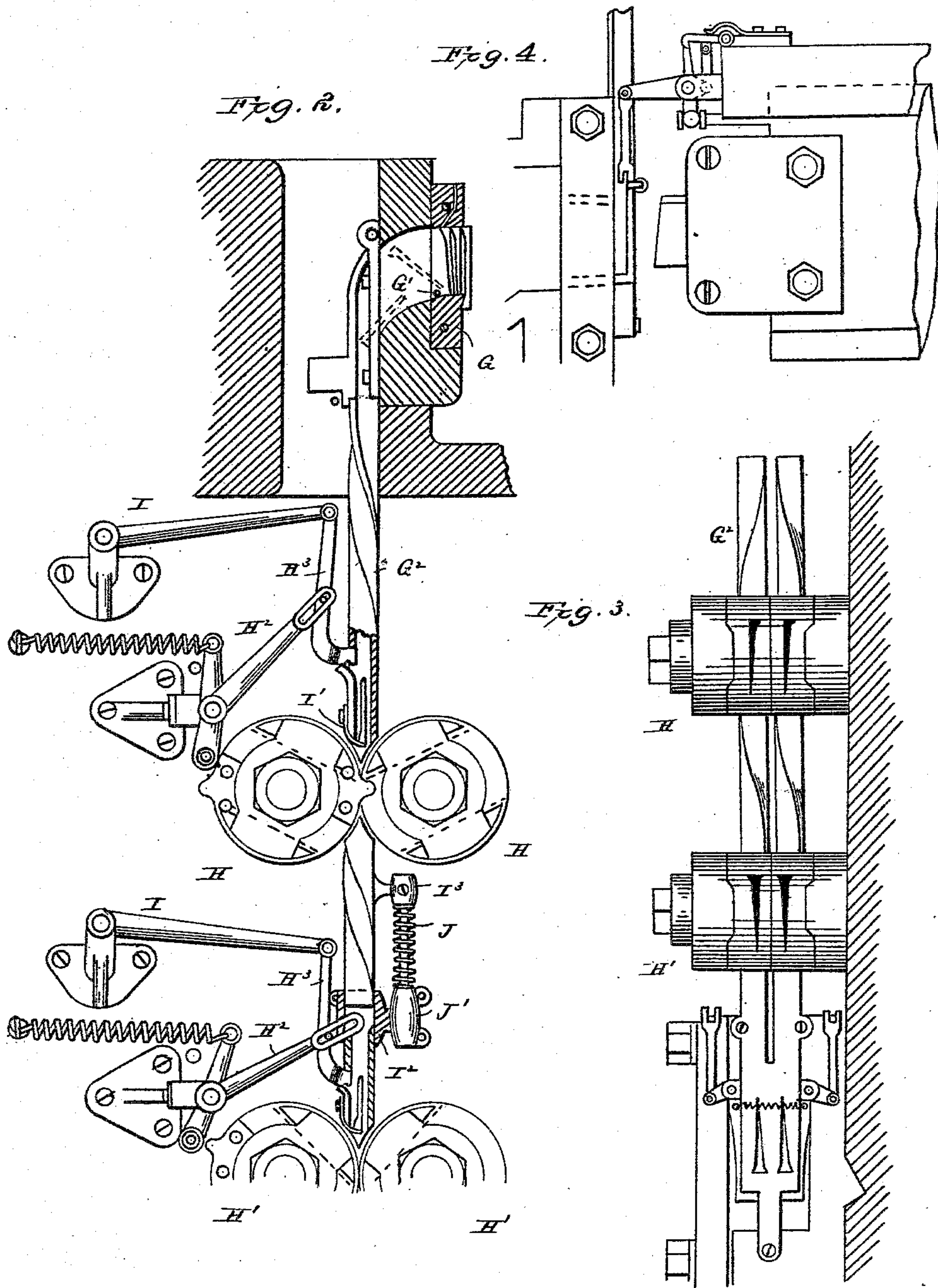
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MACHINE FOR MAKING HORSESHOE NAILS.

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JOHN A. COLEMAN, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR MAKING HORSESHOE-NAILS.

SPECIFICATION forming part of Letters Patent No. 286,390, dated October 9, 1883.

Application filed April 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. COLEMAN, 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 Horseshoe-Nail Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in machines for the manufacture of nails, it being especially designed for the production of horseshoe-nails, and having particular reference to that class in which
15 a series of operations are performed, which are substantially as follows: A bar of iron rolled to a width approximately equivalent to the length of the nails which are to be formed therefrom is provided at its opposite edges with
20 projecting ribs, which furnish the additional metal required for the heads of the nails, and is subjected to the action of a pair of punches, which at each stroke separate from it a pair of blanks approximately the size of the nails,
25 the heads of these blanks alternating in opposite directions. The punched blanks are then conducted to pairs of rollers provided with forming-dies on their faces corresponding to the configuration of the nail, and the blanks,
30 in passing between the rollers, are subjected to strong pressure and molded to the required form. Two pairs of rollers are usually employed, the first pair, in this instance, being adapted to squeeze and elongate the blanks
35 and approximately shape the nails, and the second pair being adapted to further draw and taper the partially-formed nails and reduce them to the desired shape. Finally, these nearly-completed blanks pass from the second
40 pair of rollers, and are presented to the trimming-punches, which press them through dies and strip or remove the protuberances of metal from their edges and trim them to their finished shape.

45 My invention has for its object to provide means for presenting the blanks edgewise, as contradistinguished from sidewise, to the first pair of rollers.

50 My invention has for its further object to present the edges of the blanks, as contradistinguished from their sides, without the aid of

manual manipulation, as they leave the cutting-dies to the action of the first pair of rollers.

My invention has for its further object to provide means for first presenting the edges 55 of the blanks, as contradistinguished from their sides, without the aid of manual manipulation, to the action of the first pair of rollers, and to next present their sides, as contradistinguished from their edges, to the action 60 of the second pair of rollers.

This machine is an improvement on the one for which I filed an application December 21, 1882.

In the accompanying drawings, forming a 65 part of this specification, and on which like letters of reference indicate corresponding features, Figure 1 represents an end elevation of my improved machine; Fig. 2, a view showing the cutting-dies in vertical section and 70 the conduits by which the nails are fed and the rollers in elevation; Fig. 3, a side elevation of the forming-rollers and of the feeding-conduits, and Fig. 4 a view showing the trimming-punches and the lower section of the conduits. 75

In the drawings, the letter A indicates the frame of the machine, which is constructed of metal, and provided with suitable bearings for the shafts and working parts; and the letter B, 80 the main driving-wheel, which is mounted upon a suitable shaft, B', having its bearings in the machine and in a suitable bracket secured thereto. This shaft is provided with a pinion, B², and on its inner end with a similar pinion, B³, the former intergearing with the cog-wheel D, mounted upon a shaft, D', which carries a pinion, D², by which rotation is imparted to the rollers through the medium of the respective pinions E E'. The pinion B³ engages with 85 a cog-wheel, C, mounted upon the shaft C', by which the latter is given rotary motion. Said shaft C' is provided with an eccentric, C², through which motion is imparted to the bell-crank F, whereby the devices employed 95 for feeding the blank-bar are operated, this feature of the invention being more fully illustrated and described in my application for a patent on horseshoe-nail machines above alluded to. This shaft C' is further provided 100 with an eccentric, C³, which is adapted to reciprocate a connecting-rod pivoted to an arm

attached to the shaft E³, by which motion is imparted to the trimming-dies, a crank or arm, F, being secured to this shaft and suitably connected with the sliding head F', which carries the trimming-punches, these several features being also more fully set forth in my application above alluded to. The said shaft C' is also further provided with an eccentric, F², over which is fitted an adjustable strap, having a connection with a rod or pitman which operates the cutting-punches.

The letter F³ refers to a reciprocating slide mounted in suitable ways, which receives its motion from the bell-crank lever E², and which is provided with pivoted depending fingers adapted to bear upon the upper edge of the bar of metal from which the blanks are punched, and to advance the same at certain intervals to be acted upon by the cutting-punches.

The letter G indicates the cutting-dies located opposite the cutting-punches, these dies being reversed in position, so that the head of the blank passes through the upper end of one and the lower end of the other, whereby they form blanks with their heads alternating in opposite directions, as seen in Fig. 2. At the rear of the die which forms the blank receiving its head from the upper edge of the bar is located a tripping-stud or obstruction, G', for the purpose of tripping such blanks and causing their heads to uniformly descend downward. These dies communicate with feed-conduits, that portion of the conduits immediately adjoining the rear of the dies being made flexible or yielding, so as to give in case of accidental crowding of the blanks, suitable alarm or stop mechanism being connected with the parts of the conduit which yield, in order to sound an alarm or stop the machine, the peculiarities of which appear more fully in my application above alluded to.

The letter G² indicates the conduit which conducts the blank whose head comes from the upper edge of the bar, the said conduit being constructed in several independent sections; and the letter G³ indicates the conduit which conducts the blank whose head comes from the lower edge of the bar, it being likewise constructed in several independent sections, the peculiarities of both of which will presently appear.

The letter H refers to the first pair of rollers, and the letter H' to the second pair of rollers, each of which pairs is journaled in suitable bearings in the frame of the machine and adapted to receive rotation in the manner above pointed out. These rollers are provided with die-blocks, constructed and applied in the manner set forth in my application of which mention has already been made. One essential difference exists, however, between those and the present, this difference being in the relative arrangement of the dies. In this instance those formed in the die-blocks of the upper rollers are of the configuration of an edge view of the blanks, as contradistinguished from a side view, while those in the

die-blocks of the rollers are of the configuration of a side view of the blanks, as contradistinguished from an edge view thereof. One of the rollers of each pair is provided with a cam plate or block, which acts against the lower arm of a pivoted three-arm lever, H², the other arms of these respective levers being respectively attached to a spiral spring, which returns them to their normal position and to pivoted nail presser-feet H³ by means of pins and slots. These presser-feet are guided at their upper ends by pivoted levers I, their pivotal points being attached, preferably, to the frame of the machine. The lower ends of the presser-feet are adapted to normally fit within slots formed in the sides of the conduits, and are provided with concave depressions, which, when the presser-feet are forced into the slots, bear down upon the points of the blanks, and by reason of the concavity of the seat bring the nails into a vertical position, and at the proper moment force them past the arresting-spring I' into engagement with the dies. The intermediate sections of the conduits are jointed, as seen in Fig. 2, the ends of the disjointed parts of each section fitting into a collar, I², secured in the frame of the machine. The upper of these disjointed parts is provided with a projection, I³, carrying a rod, J, which works freely in a sleeve, J', formed on a collar, I², a spiral spring being interposed between the projection and the sleeve for the purpose of yieldingly supporting said portion of the conduit. The object of this construction is to admit of a slight yield or movement of the conduit on the blanks becoming crowded. I contemplate connecting this yielding part with an alarm or stop mechanism, as before alluded to. The lower sections of the conduits are provided with hinge sides and mechanism for operating them, as seen in Figs. 3 and 4, the trimming-dies and punches being supplied, as described in my application before mentioned, the object of the said dies and punches being to remove the protuberances of metal from the edges of the blanks in order to give the blank the proper point and form the finished nail.

The above description of the several parts of this machine have been given in order that the essential feature of my invention may be understood, and I would call particular attention to the same. It consists in providing the feed-conduits with helical twists, the said twists being necessary in order to carry out my invention, as hereinbefore indicated in speaking of first operating on the edges of the blanks, as contradistinguished from operating on the flat sides thereof. This necessity arises from the fact that the blanks, as they descend from the dies into the conduits, are in such relative position to the dies on the rollers as to first present their flat sides thereto. Again, the twist in the conduit which conducts the blank whose head comes from the upper edge of the bar of iron is provided with a twist from the left to the right, which gives the blank a quarter-

turn in that direction, whereby the edges thereof are presented to the face of the roller-dies. When, however, the blank receives its head from the lower edge of the bar, the conduit is
 5 twisted in the opposite direction, or from right to left, in order to reach the same result; but the direction of the twists of these conduits, respectively, may be reversed. After the blanks have thus been acted upon on their
 10 edges, and have passed through the first pair of rollers, it is evident that it is necessary to give them a quarter-revolution about their axes, in order to present their flat sides to the second pair of roller-dies, and to accomplish
 15 this end I provide the second sections of the conduits with the helical twists, both conduits being twisted in the same relative direction. The object in first acting upon the edges of the nails is to save in the consumption of mate-
 20 rial, as I have found by practice that a shorter blank—say for a No. 6 nail (when rolled first upon the flat sides)—will make a No. 8 nail if rolled first upon the edges. The reason of this is because the blanks are wider
 25 than they are thick, and, if rolled first upon the edges, the length of the nail is obtained by the elongation of the blank, the width being thus forced into the length. Then the second
 30 rolling upon the flat sides is simply to shape the blank and give it a tapering form by making the sides converge toward the point. The trimming-dies then remove a slight chip of metal from the edges of the blank, near the
 35 point, and thus produce a finished nail.

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

1. The combination, with two pairs of nail-forming dies revolving in the same plane and
 40 operating successively on the same blank, of a spiral or twisted guide or channel interposed between said revolving dies, to turn the blank axially partly around during its passage from one pair of dies to the other, substantially as
 45 set forth.

2. In a machine for the manufacture of nails, the combination, with the punches and dies, and

the forming-rollers, of the feeding-conduits, the upper and lower sections of which are provided with helical twists, whereby the blanks
 50 are first presented to the rollers on their edges, and secondly on their flat sides, substantially as described.

3. In a machine for the manufacture of nails, the combination of the cutting-dies and punches
 55 and the forming-rollers, having their dies of the configuration of an edge and a side view of the blanks, with the feed-conduits, the upper sections of which are twisted oppositely
 60 and the lower sections in the same relative direction, for the purpose described.

4. The combination, with a machine for the manufacture of nails, of the feed-conduits, the
 65 upper sections of which are twisted quarterly in opposite directions and the lower sections of which are twisted quarterly in the same relative direction, substantially as shown and
 described.

5. The combination, in a machine for the manufacture of nails, of two pairs of rolls with
 70 the upper and intermediate conduit-sections, the upper section having a helical twist and being adapted to feed the blanks edgewise to the first pair of rolls, and the intermediate section
 75 having a like helical twist and being adapted to present the blanks flatwise to the second pair of rolls, substantially as described.

6. The combination, in a machine for the manufacture of nails, of two pairs of forming-
 80 rolls with the upper and intermediate conduit-sections, the upper section being adapted to feed the blanks to the first pair of rolls, and the intermediate section having a helical twist and being adapted to feed the blanks to
 85 the second pair of rolls and to present them thereto at right angles to the position in which they were presented to the first pair of rolls, substantially as described.

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

JOHN A. COLEMAN.

Witnesses:

WILLIAM D. ALEXANDER,
 H. A. COHNAN.