

(No Model.)

3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.
HEEL NAILING MACHINE.

No. 329,079.

Patented Oct. 27, 1885.

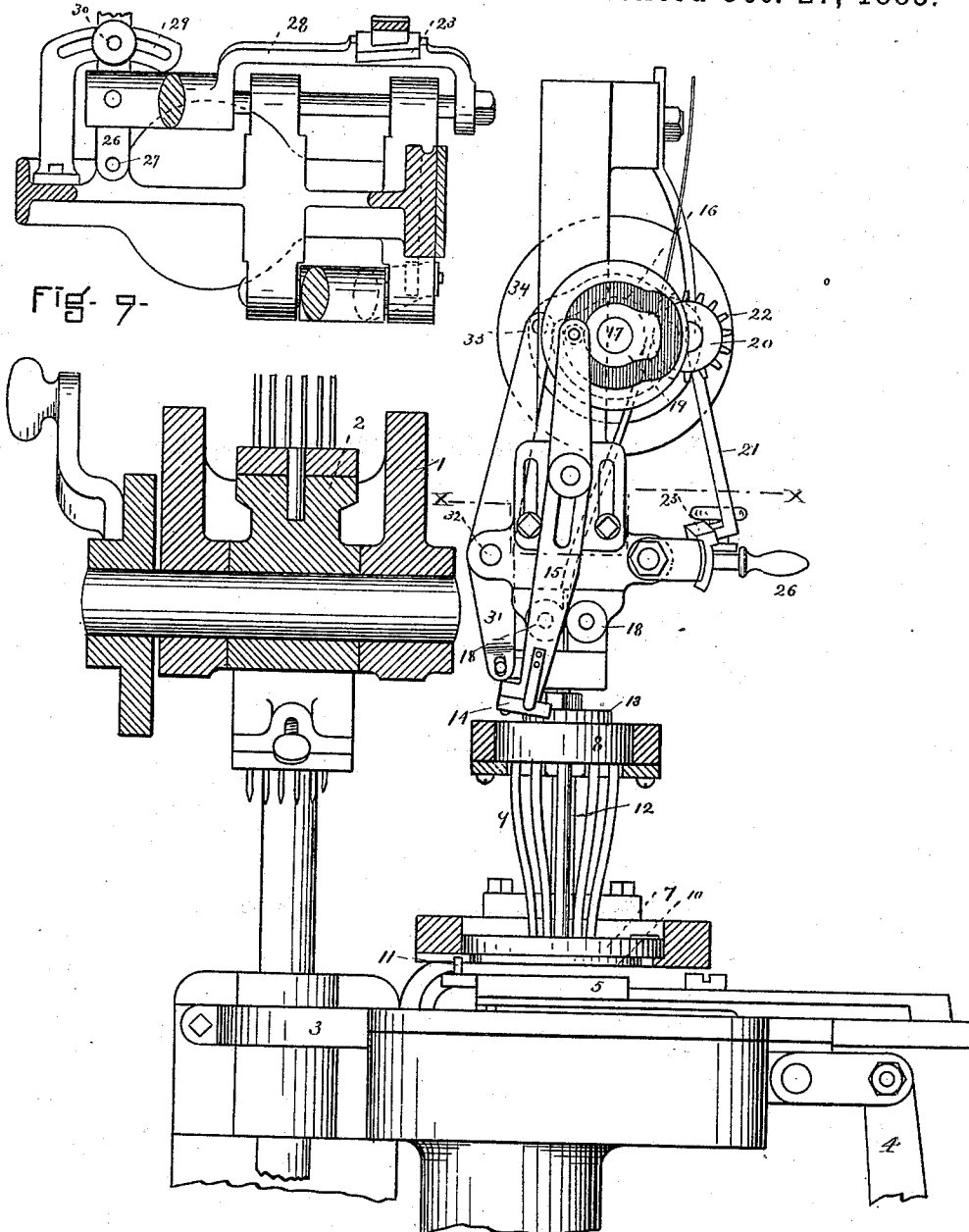


Fig. 7-

Fig. 1-

WITNESSES
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Fred. B. Dolan.

INVENTOR
F. F. Raymond

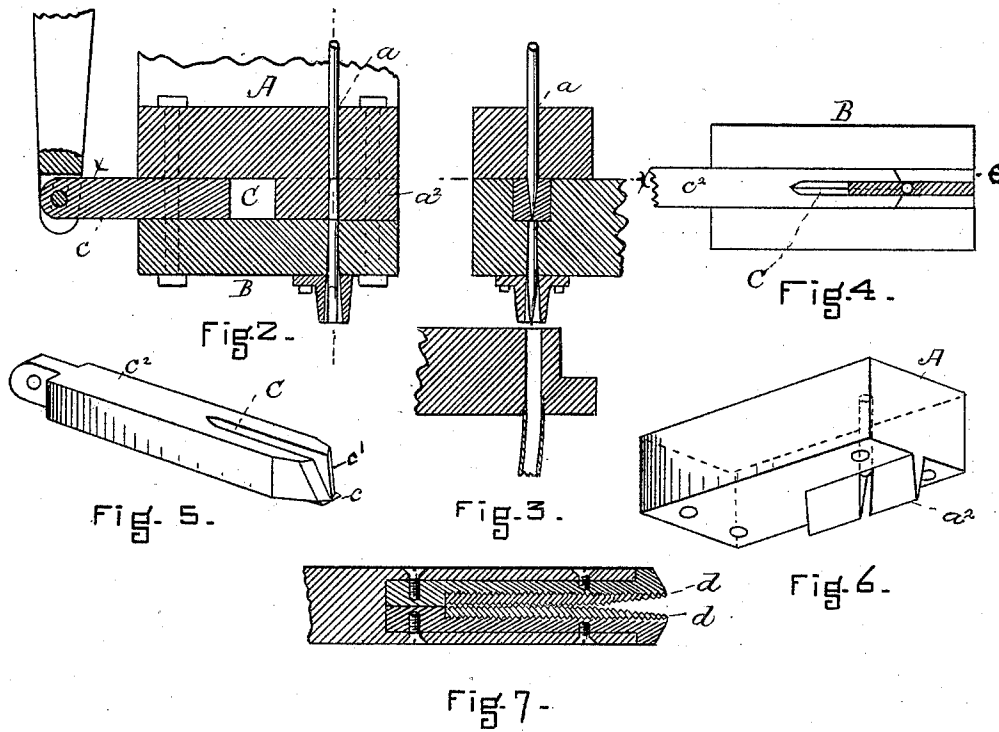
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INVENTOR
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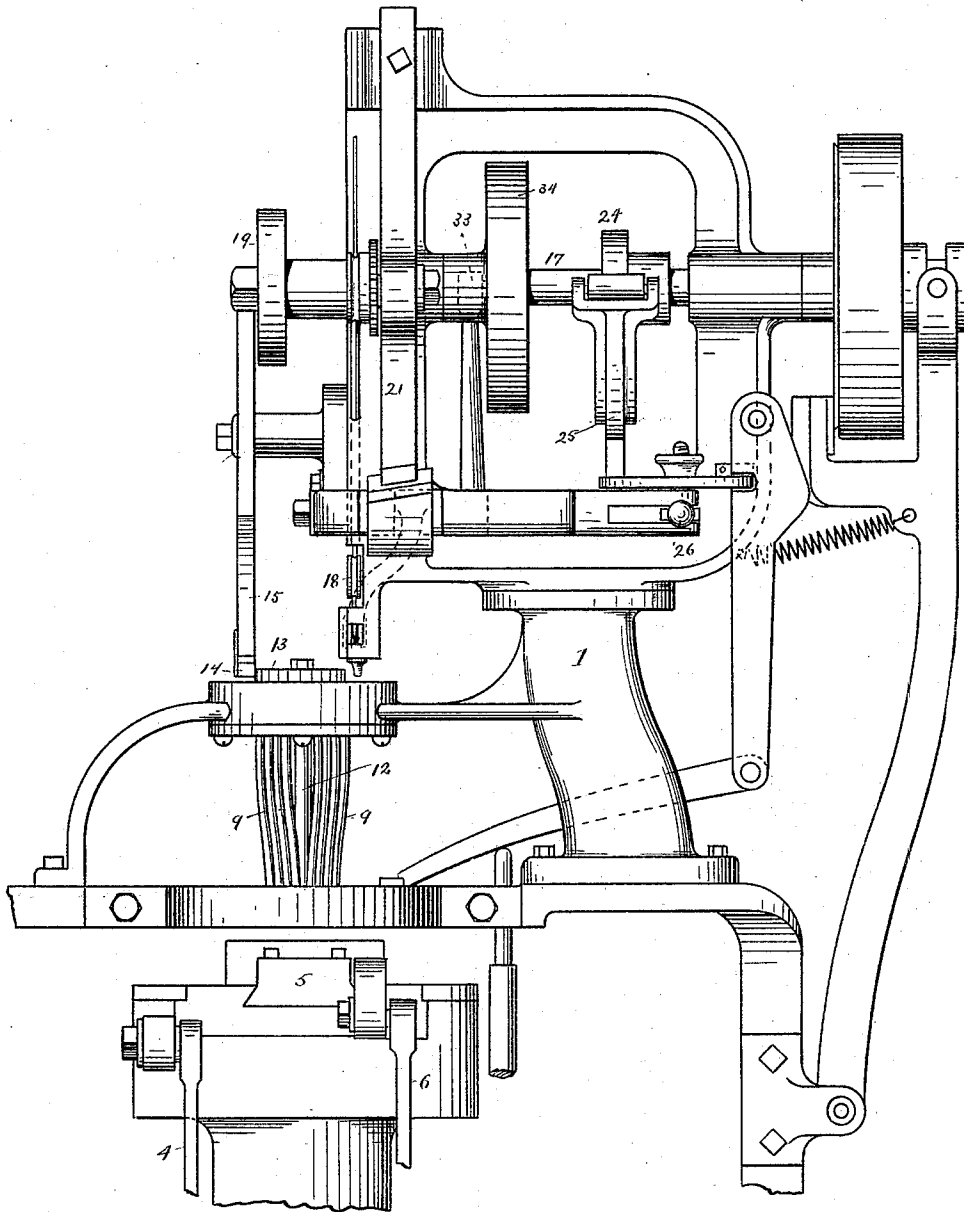


Fig. 5.

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UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, MASSACHUSETTS.

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 329,079, dated October 27, 1885.

Application filed January 13, 1885. Serial No. 152,725. (No model.)

To all whom it may concern:

Be it known that I, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Heel-Nailing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention is an improvement upon that described in my application for Letters Patent filed August 4, 1884, Serial No. 139,595, and it relates especially to the part of the machine therein described for making the heel-nails. In said application there is described a wire-feeding device and carrier which severs the nail-blank from the end of the wire and carries it to a driver, and a driver, not for driving the nails, but for moving them from the throat of the carrier and machine into a distributor. This construction necessitates quite an accurate fitting of parts and a nice adjustment of the timing of the machine, in order that the nail may be severed, pointed, and fed to the driver at the proper time, and as the driver is obliged to be reciprocated in the carrier-block it is obvious that the carrier-block must continue stationary while this movement takes place, so that it leaves a comparatively small part of the revolution of the machine for the operation of the cutters and the feeding of the nail by the carrier from the end of the wire to the line of the driver. By my present invention I dispense with the driver and parts for operating it, and use only the wire-feeding devices and the reciprocating pointing device, which are in the form of cutters, as hereinafter explained. By this arrangement the nail is severed and the wire pointed by one operation—that is, the first movement of the severing device points the end of the wire. It is then fed forward a nail length, and the next movement of the pointing mechanism severs a nail and points the next one in order. The nail which is severed either drops into the distributor or is moved therefrom upon the next feeding of the wire.

By this construction I am also enabled to obtain, without varying the cutter, varying

lengths of nails, because the length of the nail will depend entirely upon the feed, and the feed is variable, as described in said application.

Referring to the drawings, Figure 1 shows a portion of a heel-attaching machine containing my invention. Fig. 2 is a vertical section through the cutter-blocks and cutters. Fig. 3 is a vertical section upon the dotted line of Fig. 2, with a section of the nail-distributor. Fig. 4 is a view in plan below the dotted line *xx* of Fig. 3. Fig. 5 is a perspective view of the cutter. Fig. 6 is a perspective view of one of the cutter-blocks, and Fig. 7 is a view in horizontal section of a burr-cutter. Fig. 8 is a rear elevation of a portion of the heel-nailing machine, showing my improved nail making and feeding machine and a portion of the heel-nailing machine. Fig. 9 is a view, part in horizontal section and part in plan, on and below the line *xx* of Fig. 1.

While all the devices hereinafter enumerated, with the exception of the parts which relate to the feeding, pointing, and severing of the wire, have been described in prior patents and applications, hereinafter specifically referred to, I will briefly mention the parts and the relation which they bear to each other, in order that the object of the invention may be better understood.

1 is a reciprocating cross-head. It carries the revolving head 2.

3 is a templet, which is moved automatically into and out of position by the lever 4, operated by a cam, as described in the patent to me, No. 290,109, dated December 11, 1883. (Not shown.)

5 is the nail-carrier. It is moved by a lever, 6, operated by a cam, as described in my said patent, and as described in my application filed July 17, 1884, Serial No. 137,980. It is moved from a position under the nail-holder 7 to a position from whence its nails may be fed to the templet when in operative position beneath the revolving head, as shown in Fig. 1.

8 is the disk, having holes circularly arranged and at a uniform distance apart, which are connected by tubes 9 with holes in the

nail-holder 7. The holes in the nail-holder plate are closed by the thin bottom plate, 10, which is moved to open the holes by the pin 11 on the nail-holder 5, and is closed automatically by a spring. (Not shown.) The disk 8 is also connected with the nail-holder 7 by a post, 12, so that the nail-holder and the disk may be simultaneously revolved. There is attached to the disk the ratchet-wheel 13, by means of which and the pawl 14 at the end of the lever 15, and the cam 16 upon the shaft 17, the disk is revolved intermittently to bring the holes successively in line with the throat of the machine, as shown in Fig. 3. The wire is fed to the block containing the feedway, hereinafter described, between the guide-rolls 18, by the feed-roll 19, which is on the shaft 17, and the roll 20, which is movable in relation to the roll 19, and is carried or supported by the spring-arm 21, which at intervals in the revolution of the shaft 17 is caused to be moved outward to disengage the feed-roll 20 and the pinion 22, which it carries, from the feed-roll 19 and its pinion. A portion only of the feed-roll 19 is represented in Fig. 1. The arm 21 is provided with this movement by means of the wedge-block 23, which is oscillated by the cam 24 and lever 25, (see Figs. 8 and 9;) and the wedge-block is also movable laterally or horizontally at a right angle to the line of its oscillation by means of the lever or arm 26, pivoted at 27, and connected with the oscillating bar 28, carrying the wedge 23. The time that the movable feed-roll is in contact with the stationary feed-roll is varied according to the position which the wedge-block 23 bears to the end of the arm 21. The wedge-block is so shaped that when moved by the handle or arm 26 in one direction it will cause, upon its oscillation, the arm 21 to be held away or stationary longer than when moved in the opposite direction; and when it is so moved, of course the extent of wire fed is less than when the block is moved, so as not to hold the feed-roll 20 off from the feed-roll 19 so long. It will thus be seen that by varying or adjusting the feed the extent or length of wire fed to the severing and pointing mechanism, hereinafter specified, may be greatly varied, and that therefore nails of any length within reasonable limits may be made. I do not, however, claim the mechanism herein described for adjusting the feed, and reference to the patent to Erastus Woodward and Horace Weeks, No. 301,464, dated July 1, 1884, is made for a fuller description of the construction of the device. The handle, arm, or lever 26, which operates the device for varying the feed, is locked to the bracket 29 by the screw 30.

The block, hereinafter referred to, for carrying or supporting the cutters is reciprocated by means of the lever 31, pivoted at 32, and the cam-groove 33 in the cam-disk 34 on the main shaft 17.

Thus far the mechanism described does not

vary in any material respect from that already described in the various patents and pending applications already referred to or hereinafter mentioned.

I will now describe the especial devices which comprise my invention, and whereby I am enabled to make and deliver a nail without the use of a transferring device or a driver.

A is a block having a hole, *a*, which forms the feedway through which the wire is moved by the action of the feed-rolls 19 20. This block has on its lower surface the V-shaped projection *a*², through which the feedway extends. Below this block A is another block, B, in which is a hole in continuation of the feedway. Arranged to be reciprocated between these blocks is the cutter C, which is shaped to have pointing-blades or cutting-edges *c*, which preferably are V-shaped, and the severing-cutter *c*¹, which is horizontal or straight and below the V-shaped cutters. These cutters are carried by the reciprocating block *c*², upon which they are formed, or to which they are attached by means of bolts or screws, and the block is reciprocated by means of a cam and connecting mechanism, as above described, and described in said application and in Patents Nos. 225,527 and 301,464, to which reference is made.

In lieu of the cutters there may be used a cutting device having cutting-surface *d*, which is in the nature of a burr; and when this form of cutter is used it may be given a longer stroke than is provided the other cutter.

The feed-rolls 19 20 may be operated in the manner described in my said application, and the adjustment of the feed may be obtained by mechanism shown in said Patent No. 225,527, or by that shown in said Patent No. 301,464. It is immaterial, for the purposes of this invention, however, how the wire is fed, or how the length of the feed is varied, as there are many well-known ways, in addition to those above mentioned, for accomplishing this purpose. I would state, however, that it is desirable that the wire-feed rolls should be located quite near the upper block, A.

I do not of course confine myself to the means for reciprocating the cutters herein described, as any equivalent means may be employed.

It will be seen from what I have already stated that the wire from which the nails are formed is fed by the feed-rolls which govern the length of the nail to the cutters; that the end of the wire is first brought in line with the cutters and pointed; that the wire is then fed by the feed-rolls to the position shown in Figs. 2 and 3, and the cutters then reciprocated past the wire, and the portion of the wire which is below the cutter is severed, thereby forming a complete nail, while at the same time the point of the next nail to be cut off is formed, and the chips or pieces severed from the wire in forming the point are thrown out of the machine through the opening to the

space in which the cutters move, the cutters having a sufficient movement to carry the chips severed from the wire away from the same to the end of the passage or space in which they reciprocate, and so that they are expelled from the passage and fall therefrom to the ground, or to any suitable place prepared to receive them. It will further be seen that the wire during the pointing operation is substantially supported against the thrust of the cutters by the block A, its projection a^2 , and for a portion of the movement of the cutters by the block B; and it will be seen, also, that variations in the length of the nails may be had without making any change, in the machine by the lever 26. If the gage of the wire should be materially changed, it would then of course be necessary to change the blocks and cutter for others of the proper gage; and if it should be desirable to make a longer or shorter bevel to the point of the nail, then the cutting-tool and one of the blocks are removed and others substituted. The nails thus formed either drop or are forced by the feed of the wire through the throat of the machine into the distributor, and the distributor which I prefer to use is like that shown in my application for patent above referred to, and is operated by means of a ratchet, pawl, and cam, substantially as described in said application, or in any other suitable way; and it is of course unnecessary to further describe the operation of this portion of the invention here, it being sufficient to say that the distributor is arranged to receive the nails one by one from the throat of the machine, and to discharge them in the holder, from which they are automatically taken by the carrier of the nail-machine and fed automatically to a position from which they are automatically driven by the drivers, as described in my said application. The time of the carrier, however, must be such that there shall always be a hole in position to receive the nail just before it has been severed, which hole must remain in position until after the next feeding of the wire, in order that if the nail previously cut shall have lodged in the throat of the machine it may be removed therefrom by the next feeding of the wire; and in order to give as much time as possible for the feed of the distributor it will be desirable to arrange the feed so that it shall operate immediately after the cutters have withdrawn upon their backward movement from the feedway.

It will be observed that this nail-making feeding and distributing device is very simple; that it comprises only a wire-feeding device, the reciprocating pointing device, and the distributor; and I would here say that although I prefer the construction of distributor herein described and the method of its operation, I do not confine myself to its use, but may use any other equivalent device for receiving the nails from the throat of the machine and de-

livering them in proper order in the nail-holder. Of course it is desirable that the machine shall be automatically started and stopped; but I need not describe the mechanism for so doing, as it is fully described in my application for patent above referred to. It will be noticed, also, that I am enabled by this improvement to do away with the driver for forcing the nails into the distributor, the cam and spring for operating it, of the machine described in my said application, and to make one throat answer the purposes of the two described in said application, and also to do away with the transferring of the nail from one point to another—an operation which requires a very delicate adjustment of parts to provide for the necessary accurate feeding. If desired, one of the cutters may be located slightly in advance of the other, so that one side of the point is formed before the other. This construction makes the work of the die easier and requires less power.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a heel-nailing machine, the combination of the stationary block A, having the feedway a , the stationary block B, having a throat in continuation of the feedway a , and the reciprocating pointing and severing cutters C, adapted to be reciprocated between the blocks and across the feedway, all substantially as and for the purposes described.

2. The combination, in a nailing-machine, of the stationary block A, having the feedway a , the stationary block B, having the throat in continuation of the feedway, the reciprocating pointing and severing cutters C, and a wire-feeding device adapted to feed wire through the feedway a , all substantially as and for the purposes described.

3. The combination of the stationary block A, having the feedway a , the stationary block B, having a throat in continuation of the feedway, the reciprocating pointing and severing cutters C, and a wire-feeding device adapted to feed the wire to the cutter C, and means for varying the extent or operation of the feeding device, all substantially as and for the purposes described.

4. The combination of the stationary block A, having the feedway a , the stationary block B, having a feedway in continuation of the throat, the reciprocating pointing and severing cutters C, adapted to be moved across the feedway, a wire-feeding device, and a nail receiver and distributor having a series of nail-receiving passages which are successively brought into line with the throat of the machine, all substantially as and for the purposes described.

5. The combination of the stationary block A, having the feedway a , the stationary block B, having a throat in continuation of the feedway, the reciprocating pointing and severing cutters C, reciprocated across the feedway, a

wire-feeding device, a nail-distributor having a series of passages adapted to be brought successively in line with the throat of the machine for receiving a nail therefrom, a nail-holder
5 connected with said passages and arranged to receive the nails as they are successively made, and to hold them in one group, a reciprocating nail-transferrer adapted to receive all the nails simultaneously from the nail-holder and to

transfer them simultaneously to the driving devices, and said nail-driving devices, all substantially as and for the purposes described.

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