(No Model.) 3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.

NAILING MACHINE.

No. 326,780. Patented Sept. 22, 1885.

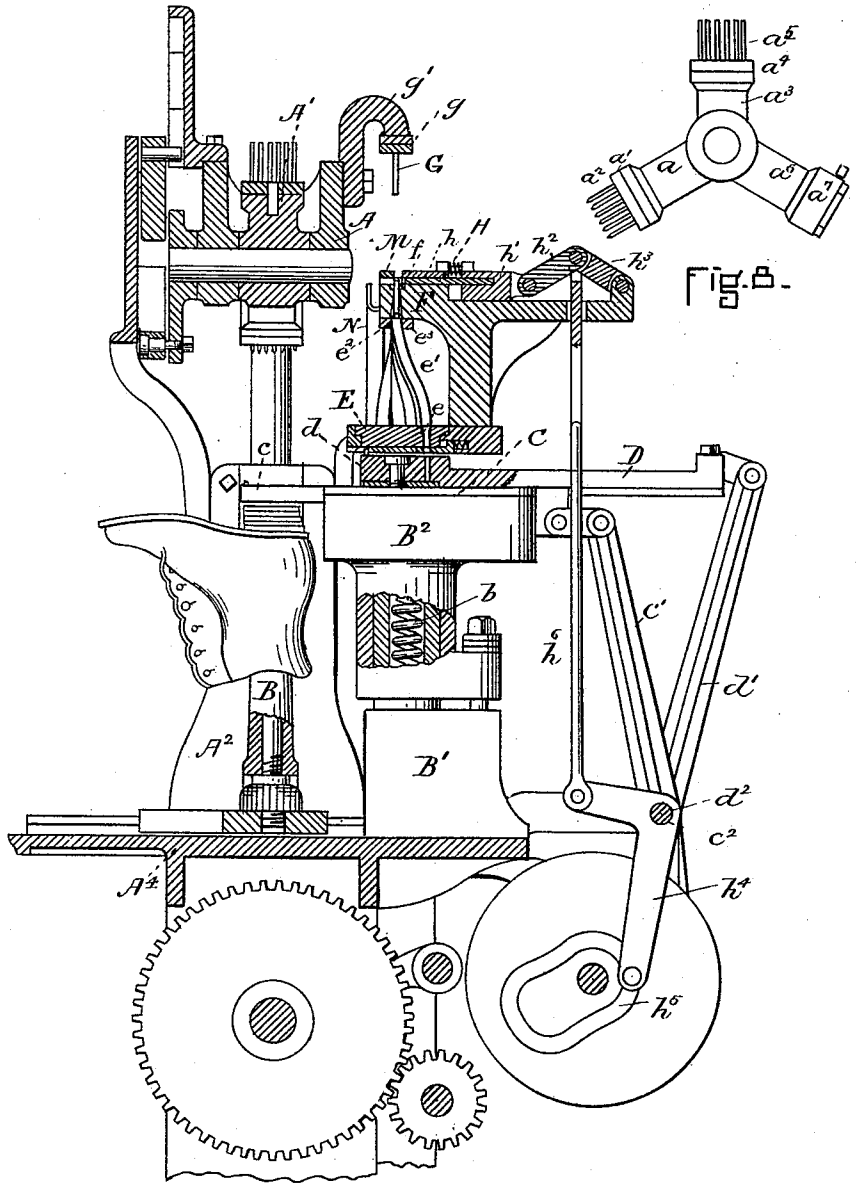


Fig. 1.

Fig. 8.

WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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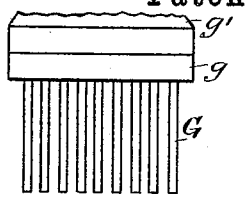


Fig. 9.

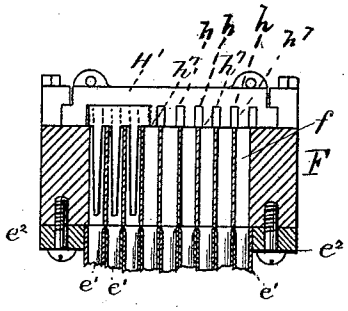


Fig. 5.

Fig. 2.

WITNESSES

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(No Model.) 3 Sheets—Sheet 3.

F. F. RAYMOND, 2d.

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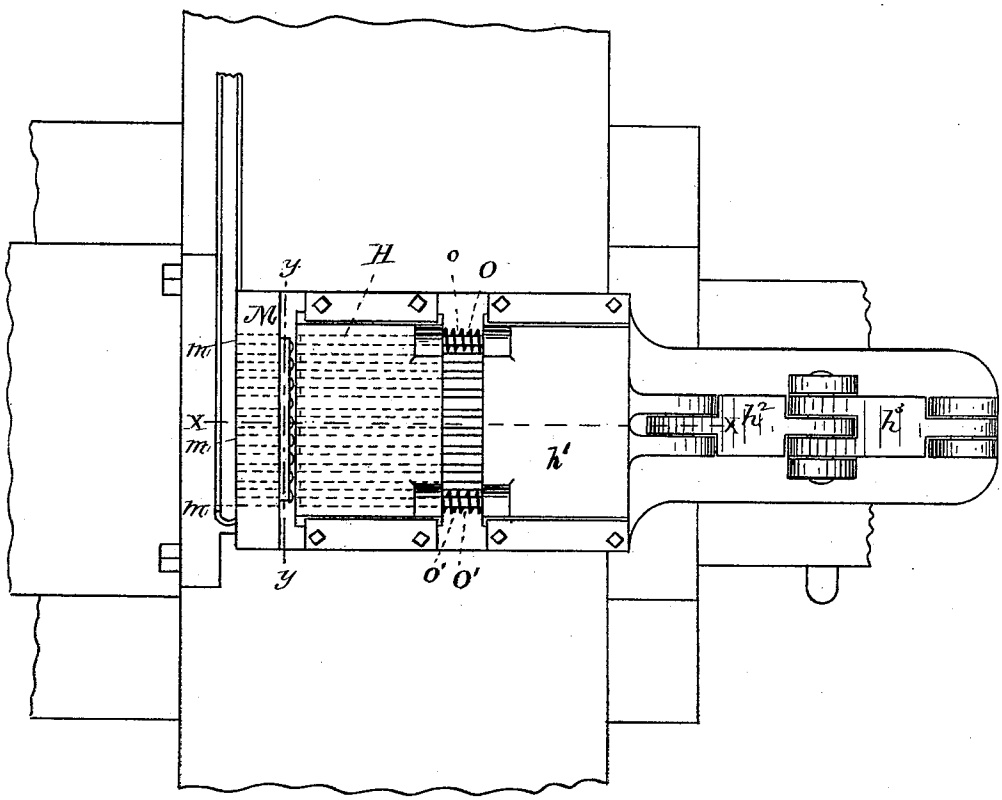


Fig. 3.

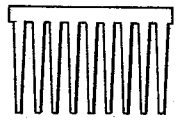


Fig. 6.

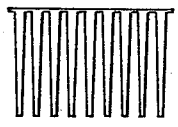


Fig. 7.

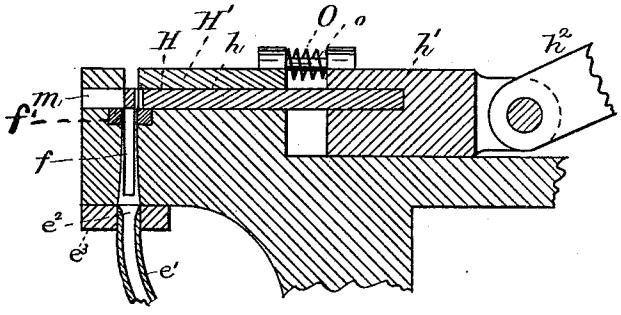


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

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

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 326,780, dated September 22, 1885.

Application filed June 27, 1885. (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 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 object of the invention is to provide means for automatically feeding or supplying to the nail-driving devices a gang or group of nails or fastenings, and for feeding the nails thus formed or severed from the severing or punching mechanism to the nail-driving devices.

I prefer to use in practicing my invention a comb-strip like that described in my application for Letters Patent filed May 15, 1885, No. 165,574, which is a comb-strip having the requisite number of nails or fastenings which it is desired to drive, and which may vary in length and size according to the necessity of the work to be nailed.

In the drawings, Figure 1 shows, part in vertical central section and part in elevation, the central and upper parts of a heel-attaching machine containing many of the features of the "National Heeling-Machine," so called, and having my improvements. Fig. 2 is a view in front elevation, enlarged, of the parts of the machine back of the cross-head and jack, including a portion of the carriage, to show portions of the nail severing, distributing, and feeding devices. Fig. 3 is a plan view, enlarged, of a portion of the nail-severing devices. Fig. 4 is a view in vertical section, further illustrating the construction and operation of the nail-severing devices, and upon the line $x\ x$ of Fig. 3. Fig. 5 is a vertical section on the line $y\ y$ of Fig. 3. Figs. 6 and 7 are elevations of the tack-strips. Fig. 8 is an elevation of the revolving head. Fig. 9 is a view of the punches or plungers, hereinafter described.

The cross-head A is reciprocated by means described in the Henderson patent, No. 316,894, or in any other desirable way, and it supports the revolving head A′, having an arm, a, supporting a block, a', carrying the gang or group of awls a^2, an arm, a^3, carrying the block a^4, which supports the gang or group of drivers a^5, and an arm, a^6, which carries the block a^7, forming the heel-spanker, and which may have the top-lift-attaching devices secured thereto. This revolving head preferably is automatically revolved by the mechanism described in the Henderson and Raymond patent, No. 317,647, dated May 12, 1885.

A^2 is one of the side frames of the machine, (the other side frame is not shown,) and A^4 the bed.

The bed supports the jack B and the post B′, and there is arranged upon the post B′ the carriage B^2, which is vertically movable against the pressure of the spring b. It supports the templet-plate C, which carries at its end the templet c, and also the nail-carrier plate D, which carries at its end the nail-carrier d. The templet-plate is moved automatically into and out of position by the lever c', pivoted at c^2, and a cam. (Not shown.) The nail-carrier plate is moved automatically into and out of position by the lever d', pivoted at the point d^2, and a cam. (Not shown.)

E is a nail-holder, which has a sliding bottom, e. It is arranged above the carriage B^2, and in a position to deliver nails to the nail holder or carrier d when the same has been moved backward from over the work-support. It has holes corresponding in arrangement to the holes in the nail-carrier and templet, and the tubes e' connect these holes with the holes e^2 in the cross-plate e^3. This plate and holder are made removable from the machine in order that those having a larger or smaller number of holes may be substituted.

Above the plate e^3 is the punching bed or plate F, which is provided with the holes f, arranged upon a straight line and to open into the holes in the plate e^3. They are preferably enlarged at and near their lower ends. The plate preferably has enough holes to feed the largest number of nails which may be required at any time. A perforated die block or plate, f', made of hardened steel, may be let into the upper surface of the bed, if desired.

There is arranged above the bed or punching-plate F a gang or group of punches or plungers, G, which is carried by the block g, attached to the bracket or arm g', projecting

backward from the cross-head A. These punches or plungers are arranged in line with the holes *f*, and are of a size to enter the same upon the downward movement of the cross-head.

I have also arranged upon the bed or support F a gang or group of horizontally-moving cutters, H, which are guided by the ways *h*, and are supported by the block *h'*, which is reciprocated horizontally by means of the toggle-joint h^2 h^3, lever h^4, cam h^5, and connecting-rod h^6. These cutters are adapted to be moved across the die bed or plate, between the holes therein, and to enter the holes *m* in the abutment or plate M, and they are adapted to sever from the comb-strip the sections which connect the shanks or fastenings.

The plate M is arranged adjacent to the line of holes *f*, and acts as an abutment or bed for holding or supporting the side of the comb-strip as the cutters are being moved horizontally, and the waste removed by the cutters from the comb-strip is pushed through the die-holes *m* into the inclined passage or chute N. The block *h'* also carries or supports the presser-block H', having the downward-extending projections h^7, (see Fig. 5,) which form the ways *h*, in which the cutters are reciprocated. This presser-block is moved forward with the block *h'*, and in advance thereof, in the operation of cutting the nails from the comb-strip, so that the faces of the projections shall come in contact with the side of the connecting portion of the comb-strip and force it against the face of the bed or block M before the cutters remove the intervening nail-connecting portions of the strip. The object of this construction is to firmly hold or clamp the comb-strip before the operation of severing or cutting the nails or fastenings therefrom begins.

In operation, when a comb strip substantially like that shown in Fig. 6 is used, it is placed in the machine, its shanks or fastenings entering the holes *f*, and the connecting section or margin extending above the holes and in front of the bed M. Upon the starting of the machine the toggle-joint is operated to move the block *h'* forward. This brings the pressure-blocks h^7 against the uncut portion of the strip and forces it against the surface of the plate or bed M, and the cutters immediately following sever or remove from the margin of the strip sections thereof sufficient to divide or separate the strip into separate or independent fastenings. The cutters are moved forward into the dies or holes sufficiently to throw the waste into the escape-chute N, and they and the presser-block are then withdrawn.

In order that the cutters may be moved after the presser-block has come to rest, I have made a yielding connection between the presser-block and the block *h'* by means of the springs O O'. The presser-block is forced forward by these springs, and upon coming to rest the block *h'* continues its movement, simply compressing the springs. The springs are mounted upon or surround the rods *o o'*, which are fastened rigidly to the block *h'*, and enter holes in the presser-block H' and are movable therein. After the removal of the cutters the punches or plungers are reciprocated with the cross-head and drive the nails, if they have not already fallen by gravity through the holes *f*, into the holes in the tubes, which guide them to the nail-receiving holes of the nail-holder E.

When a comb-strip like that shown in Fig. 7 is employed, the punches or plungers may first be operated to punch the nails from the thin connecting margin or strip, and the waste or portions of the margin remaining may be removed by a blower, or by reciprocating devices similar to the cutters, moved horizontally, preferably while the punches or plungers are below the upper surface of the bed F, to remove the waste between the fastenings and carry or force it through the holes *m* into the chute N.

It will be seen that any number of nails may thus be prepared, fed to the machine, and delivered to the nail-driving devices; also, that they may be simultaneously severed from each other, fed in a group or gang to the nail-holder, and by it simultaneously delivered to the nail-carrier, and by it transferred to a position to be simultaneously driven.

While I have represented in the drawings the invention as especially applicable for use in heel-attaching machines, I would not be understood as limiting its use to such machines, as it may be used in connection with heel-loading machines and with sole-nailing machines.

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

1. In a nail-driving machine, a support for a comb-strip provided with passages for conveying the nails formed therefrom to a nail receiver or holder, and a reciprocating gang or group of punches or cutters for simultaneously severing or cutting from the comb-strip a gang or group of individual fastenings, all substantially as and for the purposes described.

2. In combination with the nail-driving devices, the bed F, having the throat or holes *f*, and the abutment or bed M, having the recesses or passages *m*, and the gang H of reciprocating cutters, the nail-holder, and the nail-carrier, all substantially as and for the purposes described.

3. The combination of the nail-driving devices, the bed F, having the holes *f*, the vertically-reciprocating punches or plungers G, and horizontally-moving cutters H, all substantially as and for the purposes described.

4. The combination of the bed F, having the holes *f*, for receiving the shanks of a comb-strip of fastenings, and intermediate supports holding the connecting margin of said strip while it is being divided into separate fastenings, with passages connecting with the holes

in the nail-holder E, all substantially as and for the purposes described.

5. The combination of the abutment M, the cutters H, bed F, and the presser-block H′, all substantially as and for the purposes described.

6. The combination of the nail-driving devices, the bed F, having the holes *f*, connected with the nail-holder E, the holding-block *h*′, the toggle h^2 h^3, cam h^5, and connecting devices, all substantially as described.

7. The combination of the bed F, having the holes *f*, the passages *m*, the reciprocating cutters H, and the escape-chute N, all substantially as and for the purposes described.

8. In a nailing-machine, in combination with nail-driving devices, a reciprocating gang of plungers or cutters for automatically separating a comb-strip of fastenings into separate or disconnected fastenings, and devices for automatically transferring said fastenings to a position to be driven by the driving devices, all substantially as described.

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Witnesses:
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FRED. B. DOLAN.