

(No Model.)

8 Sheets—Sheet 1.

F. F. RAYMOND, 2d & C. H. FOGG.
NAIL FEEDING DEVICE.

No. 569,518.

Patented Oct. 13, 1896.

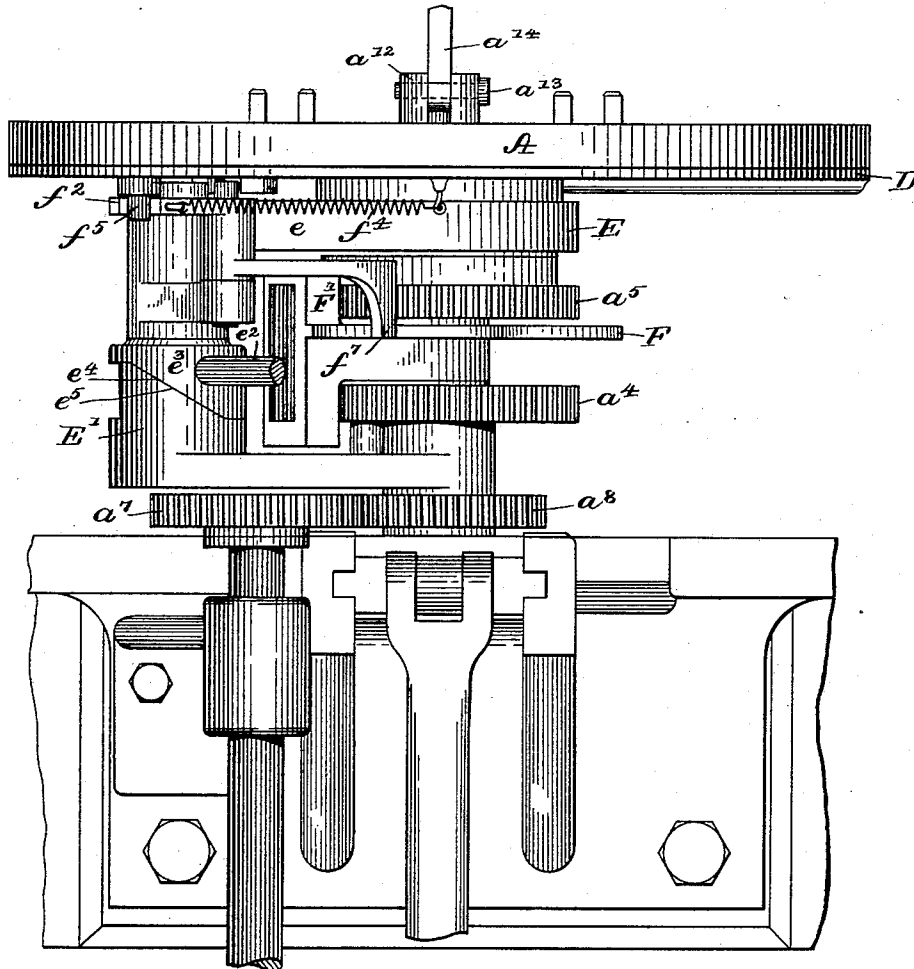


Fig. 1.

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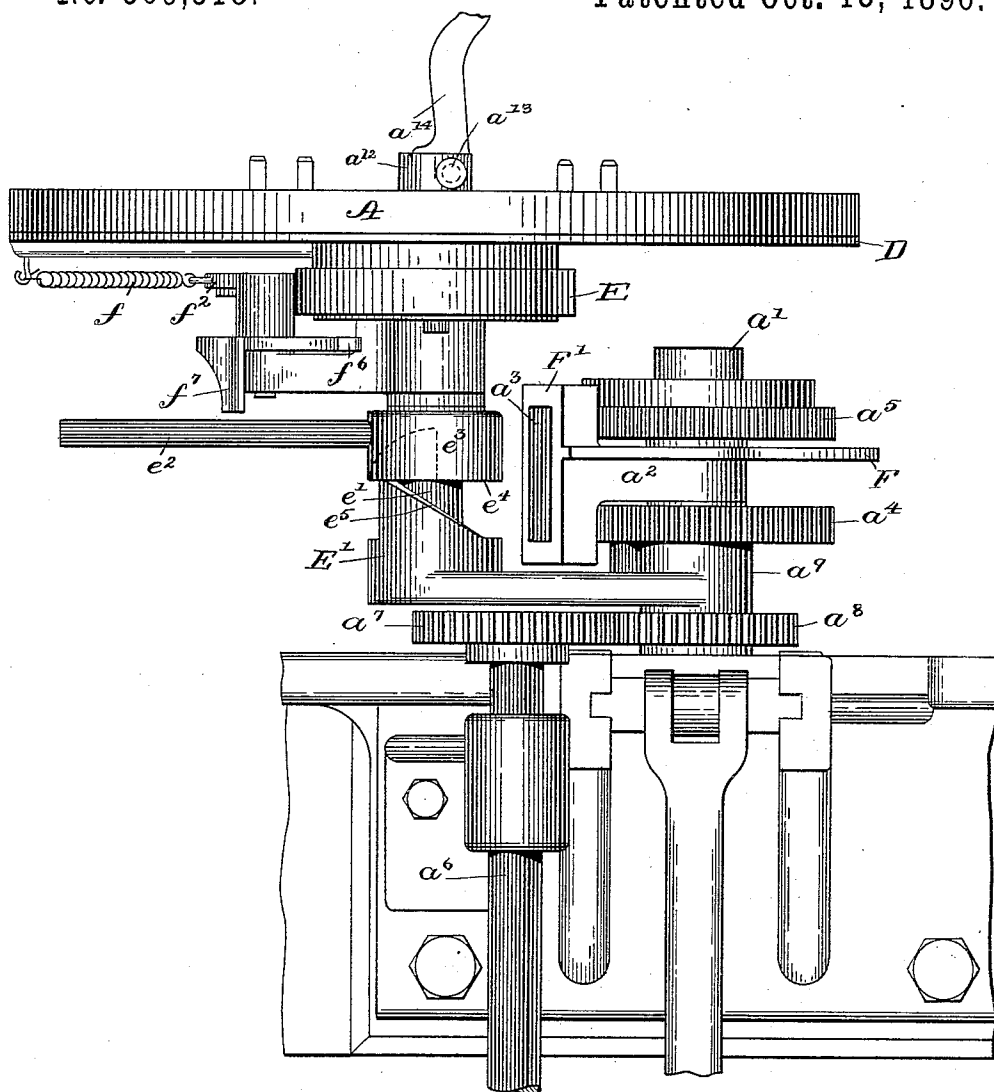


Fig. 2.

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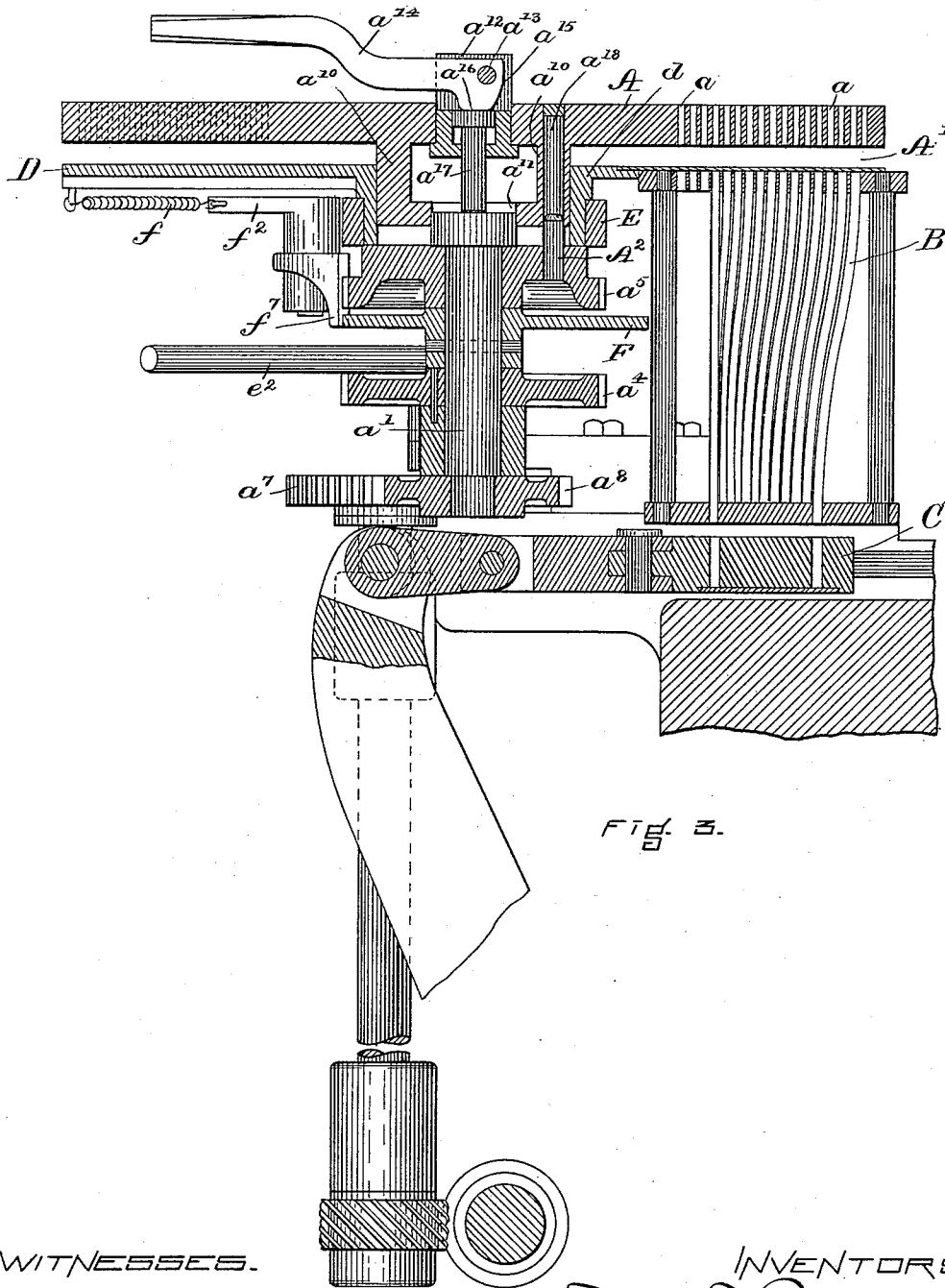


FIG. 3.

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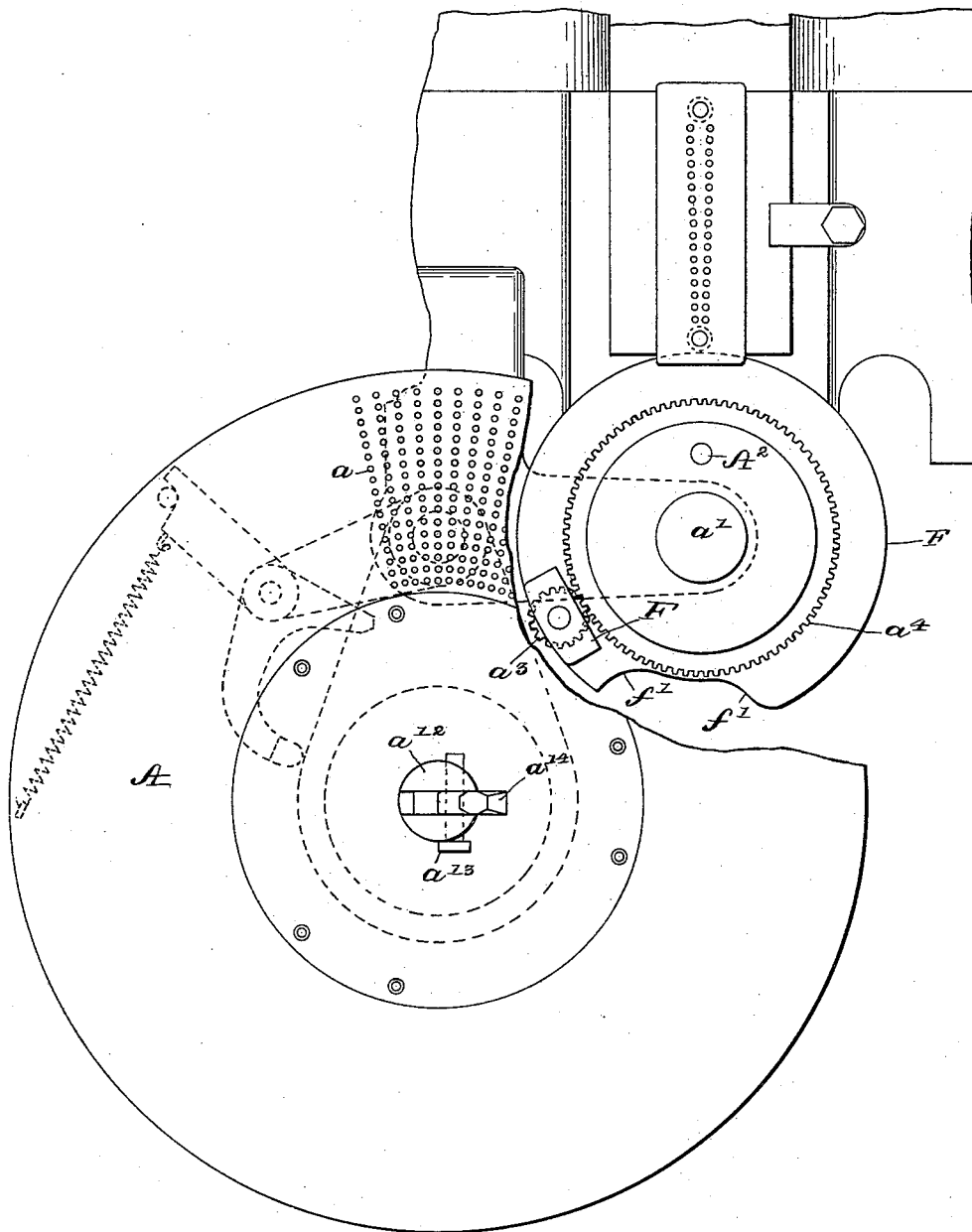
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FIG. 4

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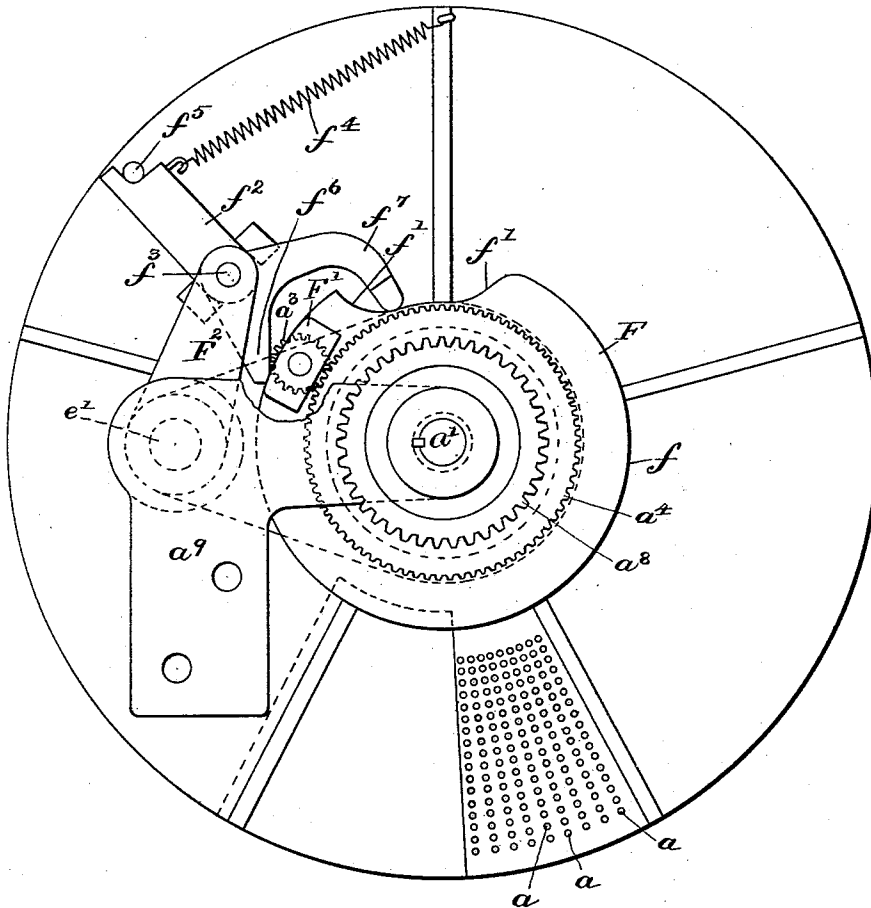


FIG. 5.

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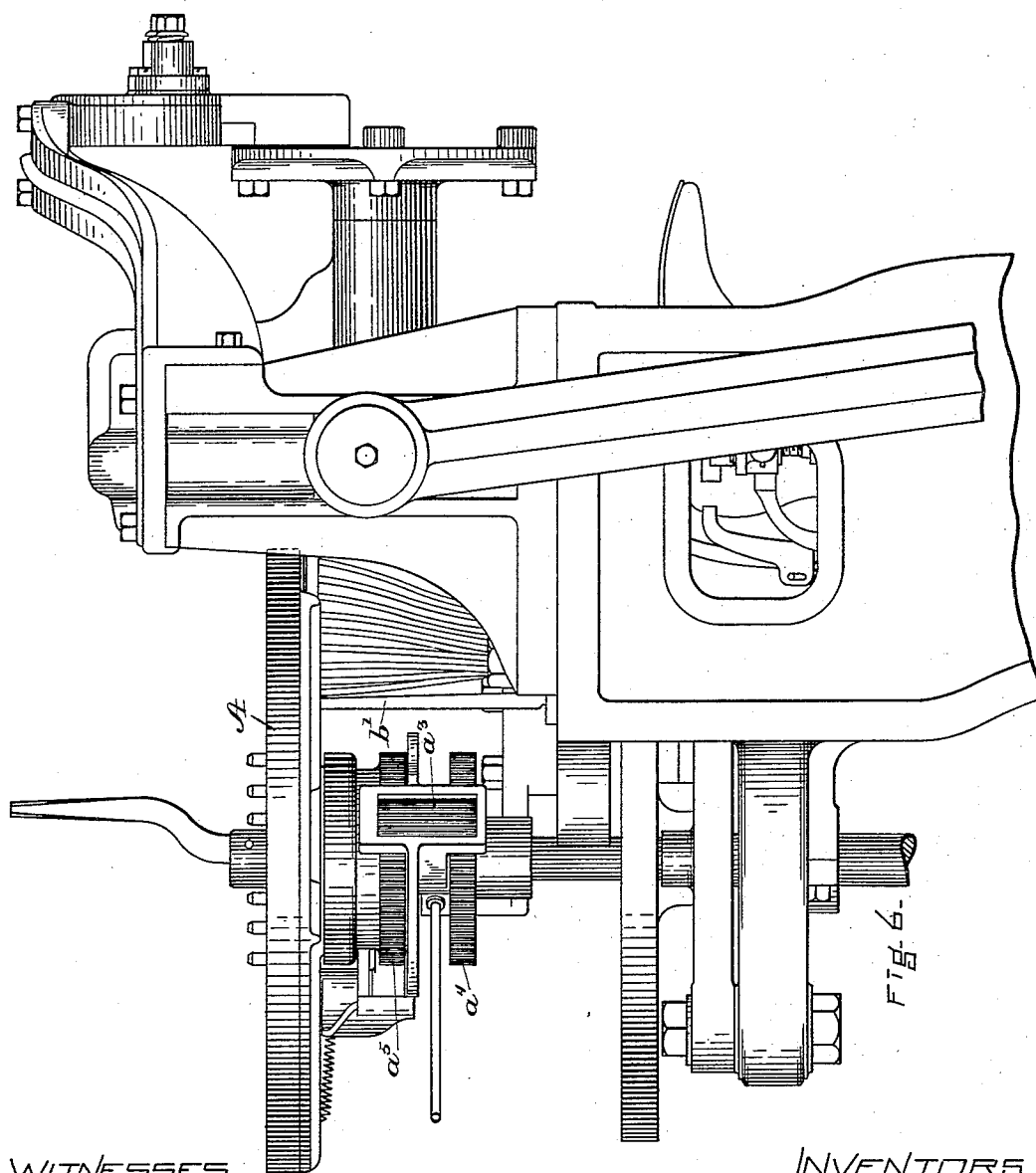
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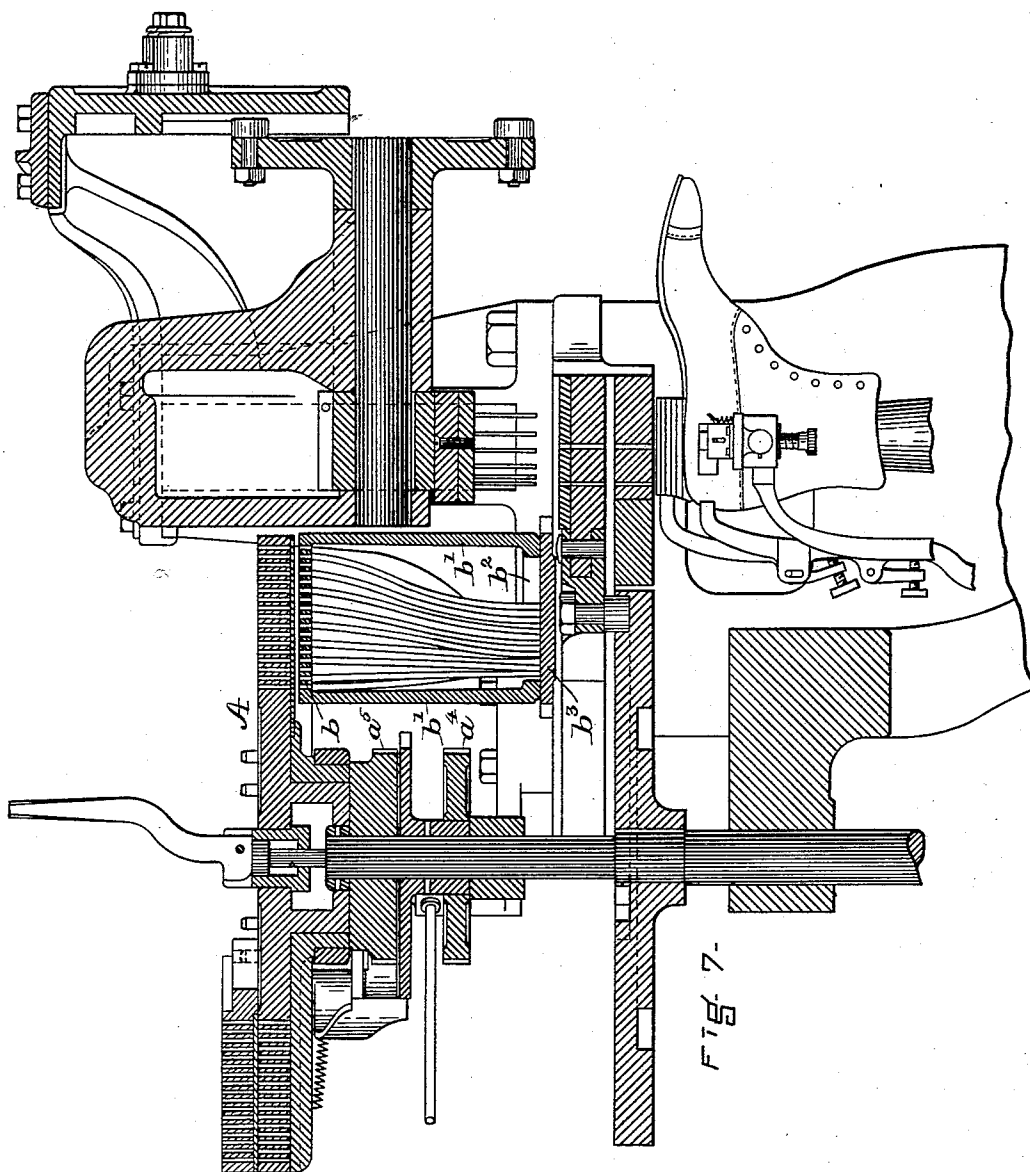
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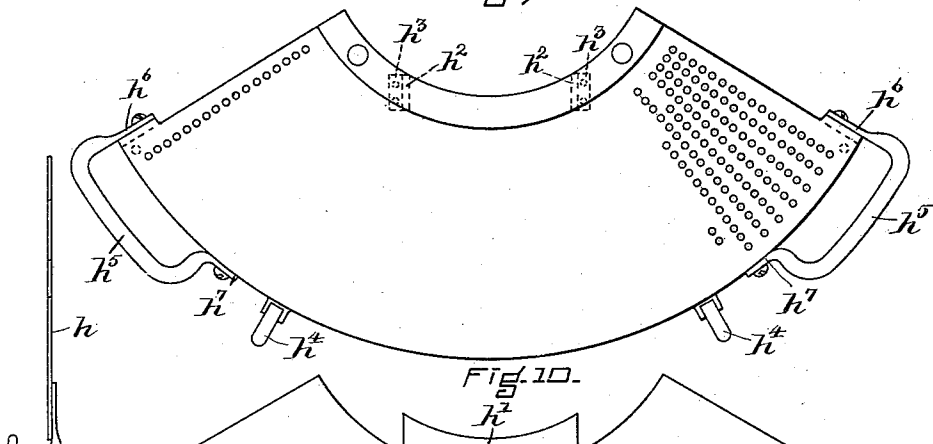
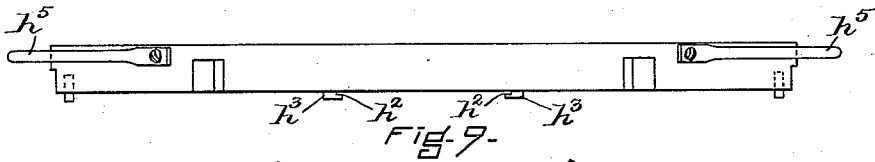
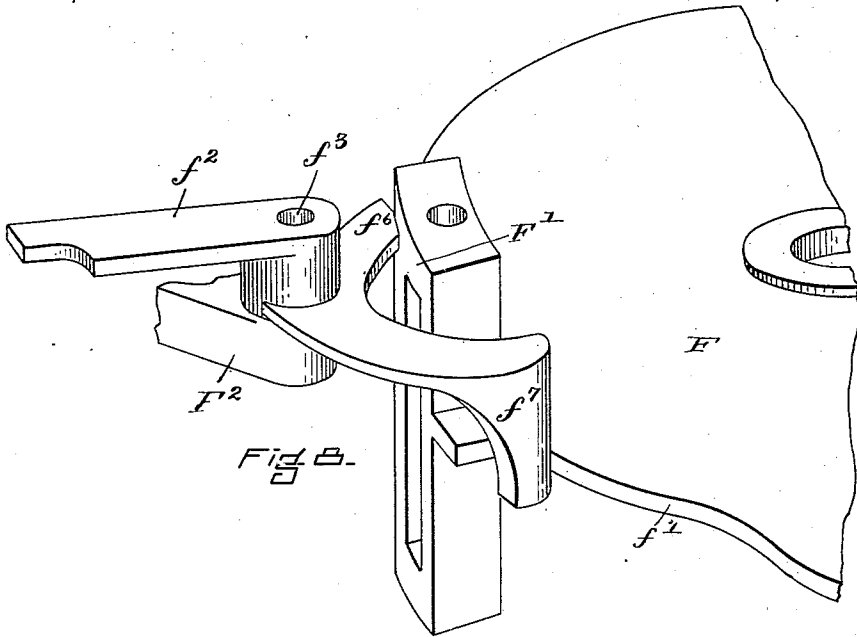
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UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, AND CHARLES H. FOGG, OF HYDE PARK, MASSACHUSETTS, ASSIGNORS TO JAMES W. BROOKS, OF PETERSHAM, AND JOHN BROOKS, OF CAMBRIDGE, MASSACHUSETTS, TRUSTEES.

NAIL-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 569,518, dated October 13, 1896.

Application filed October 3, 1895. Serial No. 564,492. (No model.)

To all whom it may concern:

Be it known that we, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex, and CHARLES H. FOGG, of Hyde Park, in the county of Norfolk, State of Massachusetts, citizens of the United States, have invented a new and useful Improvement in Nail-Feeding Devices, of which the following is a full, clear, and exact description, reference
10 being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to an improvement in nail-feeding devices organized to receive and hold nails in radial or diverging lines and to automatically feed them in lines or groups to a nail-distributor.

The invention is illustrated as applied to an automatic heel-loading machine.

15 In the drawings, Figure 1 is a view in rear elevation of the nail-feeding devices, also showing in rear elevation a portion of the heel-loading machine. Fig. 2 is also a view in rear elevation of the same parts shown in
25 Fig. 1, a portion of them being represented in a different position. Fig. 3 is a view in vertical central section of the nail-feeding devices and of a portion of the heel-loading mechanism. Fig. 4 is a view in plan of the nail-feeding devices when in the position represented in Fig. 2. Fig. 5 is a view, inverted,
30 of the nail holding and feeding plate and parts operating therewith. Fig. 6 is a view in side elevation of the upper part of a heel-attaching machine and also a view in side elevation of the nail holding and feeding devices attached thereto, the said devices being represented as actuated by an extension of a vertical shaft common to this type of attaching-machines. Fig. 7 is a view in vertical
40 central section of the parts represented in Fig. 6. Fig. 8 is a detail view to show the lever for operating the cover-plate and its actuating-cams. Figs. 9, 10, 11, and 12 show
45 a form of nail-loading skimmer for loading the holes of the nail holding and feeding plate with nails.

A is a plate of metal, circular in shape, the greatest part of which is provided with radial
50 lines a of perforations or holes extending

through it from one surface to the other, the various lines being quite close to each other and the holes of each line being also uniformly spaced and closely arranged, so that a very large number of such holes is provided
55 in a plate of relatively small diameter. These holes act to receive and hold nails or fastenings and in lines coincident with the lines of holes or in any other desired order, the nails being prevented from dropping from the
60 holes by means of a cover-plate over which is the nail-feeding plate A. The nails are supplied to holes of the plate A directly by hand or by means of large portable nail-holders called "skimmers," one of which is shown
65 in Fig. 9, or directly by any suitable automatic nail-supplying mechanism. For ordinary uses, however, we prefer that the nails be either supplied by hand directly to the nail-holding plate or that they be supplied by
70 the portable skimmer, the portable skimmer being loaded at a bench either by hand or by an automatic loading mechanism.

The nail-holding plate A is slowly rotated upon the operation of the machine to bring
75 one or more lines of holes in registration with one or more lines of holes of the nail-distributor B, through the passages or channels of which the nails are delivered to the holes of a nail-carrier C, the nail-carrier being movable from beneath the distributor to the nail-driving devices, preferably automatically. The nail-holding plate has also a vertical
80 movement in relation to the hole cover-plate D, that nails or pieces of nails which may have lodged between the two plates may be removed. This position of the parts is represented in Fig. 3, and the nail-holding plate and cover are movable both upwardly from
90 the top of the distributor B and horizontally to a position at one side of the distributor B (see Fig. 4) in order that the distributor may be readily placed and removed and also in order that access may readily be had to the
95 holes of the distributor.

We prefer that the rotary feeding movement be imparted to the nail-holding plate by means of a shaft a' , to which is secured an arm a^2 , carrying the long pinion a^3 and the differential gears $a^4 a^5$, one of which, the gear
100

a^4 , is fixed or stationary, and the other of which, the gear a^5 , is connected with the rotary nail-holding plate A. The gears a^4 a^5 have teeth which vary one or two in number, and the pinion a^3 meshes with the teeth of both and upon a complete revolution advances the gear a^5 one or two teeth, as the case may be, or, in other words, the nail-holding plate is rotated sufficiently to feed the nails from one line of holes or from two lines, according as the number of teeth in the gear a^5 may vary from the number of teeth in the gear a^4 . The shaft a' is represented in Fig. 2 as operated from any desired shaft of the heel loading or attaching machine by means of the shaft a^6 , having at its upper end a driving-gear a^7 , which meshes with a gear a^8 upon the lower end of the shaft a' . The said shaft a' is supported by means of a bracket a^9 , (see Figs. 2 and 5,) bolted or attached to the frame of the heel loading or attaching machine. In order that the nail-holding plate A may be lifted from the cover-plate D, we have provided it with the hub a^{10} , which extends from its under side into the hub d of the cover-plate D. This hub has the hole a^{11} , which surrounds the upper end of the shaft a' , and there is attached to the center of the nail-holding plate A to extend upwardly therefrom a central post a^{12} , to which is pivoted at a^{13} a lever a^{14} , having the cam-surface a^{15} and rest a^{16} . When the lever is moved from its vertical position shown in Fig. 1 to the horizontal position shown in Fig. 3, the cam a^{15} rides upon the upper end of the pin a^{17} , which extends to the upper end of the shaft a' and lifts the nail-holding plate A in relation to the hub d and shaft a' until the rest a^{16} in the cam is reached, when it is locked stationary in its elevated position. (See Fig. 3.) This provides the space A or opening A' between the cover-plate D and the nail-holder plate.

The nail-holding plate and the cover-plate are movable together vertically by means of the collar or yoke E, into which the hub d of the cover-plate extends and which supports the cover-plate and the nail-holding plate, and this yoke or collar is at the end of an arm e , which is pivoted upon the stud e' at one side of the shaft a' . This stud is attached at its lower end to the bracket E' , and the arm e not only has a vertical movement upon it, but also a swinging movement. The vertical movement is obtained by turning the handle e^2 , the handle being attached to a sleeve e^3 , upon which the arm e rests, which sleeve surrounds the stud e' and has upon its under edge the curved incline e^4 , which bears or rides upon the stationary curved incline e^5 . When the parts are in their lowest position, these inclines bear the relation to each other represented in Fig. 1, and when in their highest position that represented in Fig. 2. This lifting of the arm e , collar E, cover-plate D, and nail-holding plate A causes the nail-holding plate to become disengaged from the

driving-pin A^2 , which is secured to the gear a^5 to extend upward from its upper side (see Fig. 3) into a hole a^{18} in the hub a^{10} of the nail-holding plate, so that the arm, collar, cover-plate, and nail-holding plate may then be swung laterally from over the distributor B and shaft a' upon the center of the stud e' to fully expose the distributor. (See Fig. 4, where these parts are represented as so removed.) The cover-plate serves to cover the holes of the nail-holding plate A or prevent the nails from dropping therefrom as the plate is fed or moved to bring its holes in successive order in line with the holes in the upper end of the distributor B. When, however, the nail-holding plate has advanced one or two rows of holes containing nails to a position over the holes of the distributor, it is then necessary to move the cover-plate laterally sufficiently to uncover one or two lines of holes, which are in register with the holes of the distributor or approaching such registration, and in order that this may be accomplished the nail-cover plate D is supported in the collar E, so that this slight turning movement may be imparted to it. It is also necessary that the cover-plate should be returned to its hole-covering position immediately after it has been moved to uncover the holes and before the nail-holding plate has been moved any appreciable extent; and we have illustrated as one means for providing the cover-plate with these movements a cam disk or plate F upon the pinion-bearing arm a^2 , which has the edge f of the same diameter except where it is cut away at f' . This cam operates the hold the cover-operating lever f^2 in a position to maintain the cover closed excepting when it is desired to open it, which is when the cut-away section permits the lever to be moved by the cam F'. (See Fig. 8.) The section of the cam edge extending from the cut-away section also serves to move the lever sufficiently to close the plate. To permit these cams F F' to so act, the lever f^2 is pivoted at f^3 to an arm F², extending from the arm e . The lever is connected at its outer end with the cover-plate by the spring f^4 and pin f^5 and at its inner end with the edge of the cam-plate F and the cam F' by the forked or separated arms f^6 f^7 . These arms are so shaped that when the cam F' comes in contact with the arm f^6 the cover-plate is moved sufficiently to uncover the holes in the nail-holding plate A, which registers with the holes in the distributor B, the arm f^7 of the lever then moving into the cut-away section of the cam F. The continued revolution of the cams F' F removes the cam F' from contact with the arm f^6 and permits the cam F to again come into contact with the arm f^7 and move it sufficiently to close the cover-plate or permit it to be closed and to hold it closed or permit it to be held closed until the cam F' again comes into contact with the arm f^6 .

It will be understood that the cover-plate

is practically continuous, except at a point immediately beyond the top of the distributor, where it is open or cut away for a short distance in order to permit nails which may not have been delivered from the holes of the nail-holding plate to the distributor to drop.

The main part of the cover-plate is preferably of cast-iron; but the portion which is immediately over and adjacent to the distributor is made thin and of sheet-iron or thin steel, and it is secured to the remainder of the plate in any desired way. The object in making this part of the cover thin is to reduce the space between the under surface of the nail-holding plate and the top of the distributor, when the holes are uncovered, to the smallest possible extent in order that the nails may drop from the holes of the nail-holding plate into those of the distributor with the least liability of catching in their movement.

In Figs. 6 and 7 we have shown a construction which varies from that above described in these respects—namely, that the shaft upon which the nail holding and feeding devices are mounted and which caused the movement of the actuating-pinion a^3 is an upward continuation of the vertical shaft of an automatic heel-loading or heel-attaching machine of the type known as the "Standard Automatic Machine," the said machine having at its rear a vertical shaft which, among other things, actuates the nail-carrier, which receives nails and transfers them to the nail-driving devices by means of a cam-disk having a cam-groove receiving a cam-pin upon a horizontally-moving slide to which the nail-carrier is directly attached, and this construction dispenses, of course, with the gears a^7 a^8 and the shaft a^6 and its connections with some shaft of the compressing or loading machine heretofore described and also simplifies the apparatus. The distributor shown in these figures is an improvement upon that shown in Fig. 3 in that the top plate b has extending from its ends integral extensions b^1 , the lower ends of which are connected by an integral skeleton ring or border b^2 , to the under surface of which a separate plate b^3 is attached by screws or in any other desired way. The upper plate b has formed in it holes of the arrangement of one or more lines of the nail holding and feeding plate. The detachable lower plate b^3 has holes arranged in the order in which it is desired to deliver the nails to the nail-carrier or other device, and it can be easily removed and another having a different order or arrangement of holes substituted. This provides a very cheap and effective construction of distributor.

The nails may be supplied to the nail holding and feeding plate by means of portable skimmers or loaders having a large number of nail-receiving holes of the arrangement of the holes of the nail holding and feeding plate. These skimmers are adapted to be loaded at one side of the machine and to then be placed upon the nail holding and feeding plate, its

under cover removed and the nails delivered to the holes of the nail holding and feeding-plate.

To center the holes of the skimmer with those of the nail holding and feeding plate we have provided registering-pins, which extend upward, (see Fig. 1,) and the inner edge of the skimmer with holes of the same arrangement.

In Figs. 9, 10, 11, and 12 we have shown a form of skimmer that varies from the one described in our application, Case A, of even date, in these particulars: The cover-plate h instead of being held at its ends by flanged pieces secured to the ends of the skimmer has a backward-extending central tongue h^1 , the edges of which are parallel and which is held by the parallel flanges h^2 of plates h^3 , secured to the under surface of the skimmer back of the inner line of holes. This method of attaching the skimmer-plate has a number of advantages in that it dispenses with the use of the end flanges above referred to, which were found to interfere with the placing of the skimmer when long nails were being fed to the nail holding and feeding plate, as the flange nearest previously-fed nails then projected sufficiently to come in contact with some of the end line thereof which had tipped enough to be in line with the flange. Another advantage arises from the fact that a slight movement of the cover-plate will not cause it to be disconnected from the skimmer, as is the case where the flanges which hold the edge are inclined outwardly instead of parallel. It has also been found desirable to provide the cover with the form of fixed handles h^4 , (represented in Fig. 11,) and the skimmer with the fixed lateral extending handles h^5 (represented in Fig. 10) these handles being rigidly secured to the end and front of the skimmer and extending horizontally therefrom, the end h^6 of each handle being fastened to an end of the skimmer and the end h^7 of each handle to the front edge thereof. The skimmer is registered or centered upon the nail holding and feeding plate by pins carried thereby and by holes formed in the inner edge of the skimmer, as before described.

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

1. The combination in a machine of the character specified, of the nail holding and feeding plate and means for turning the same, comprising its shaft, the stationary gear a^4 , the movable gear a^5 varying as to teeth as described, and the pinion a^3 carried by the shaft and engaging the teeth of the stationary and movable gear, the movable gear being connected with the nail holding and feeding plate.

2. The combination of the nail-holding plate A, having the hub a^{10} , and hole a^{18} with the pin A^2 connecting the gear a^5 with the plate.

3. The combination of the nail-holding and

feeding plate A, having the hub a^{10} and hole a^{18} , the pin A^2 connecting the gear a^5 therewith, and means for moving the plate and hub from and toward said pin.

5 4. The combination of the nail holding and feeding plate A, the pin or stud a^{17} , and the lifting-lever a^{14} , pivoted to the plate and having a lifting cam-section a^{15} and a holding-section a^{16} .

10 5. The combination in a machine of the character specified, of the nail holding and feeding plate A, the cover-plate D, and means for operating the cover-plate, comprising the cam F, the connecting-lever f^2 and spring f^4 .

15 6. The combination of the cover-plate D, the cam F having surfaces f , f' , the lever f^2 , pivoted as described, and having the arms f^6 , f^7 , the pin f^5 and the spring f^4 , substantially as described.

20 7. The combination of the arm e , the nail holding and feeding plate A and cover-plate D, and means for moving the arm vertically, whereby said plates are disengaged from their operating mechanism.

25 8. The combination of the arm e , the nail holding and feeding plate A, and the cover-plate, the said arm having a vertical movement and a horizontal movement whereby the said plates are disengaged from their operating mechanism and moved laterally therefrom.

30 9. The combination of the nail holding and feeding plate, the cover-plate, the supporting-arm e , the said arm having a lateral movement in relation to the devices for operating the plates.

35 10. The combination of the nail holding and feeding plate A, the cover-plate D, the arm e for supporting the same, having a bracket F^2 , to which the cover-operating lever f^2 is pivoted, the said lever bearing a detachable relation to its operative cam whereby it is adapted upon the movement of the arm e to be moved vertically with the nail holding and feeding plate and the cover-plate, or laterally or both in relation to said cam, as and for the purposes described.

40 11. The combination in a machine of the character specified of a stationary vertical shaft which may be a cam-shaft of the machine with which the nail-feeding apparatus is used and which carries the mechanism for actuating the nail holding and feeding plate and the cover-plate with the said nail holding and feeding plate and cover-plate and means for disengaging them from said stationary actuating devices and moving them away from the same, as and for the purposes described.

50 60 12. The combination of the rotary shaft a' adapted to rotate when the nail-holding ma-

chine is in operation, a fixed gear a^4 through which the shaft extends, a gear a^5 loose upon said shaft and having teeth varying in number from the teeth of the gear a^4 , a pinion a^3 65 mounted at the end of an arm attached to said shaft to engage the teeth of the gears a^4 , a^5 , and a nail holding and feeding plate adapted to be operated by said gear a^5 .

13. The combination of the rotary shaft a^6 , 70 the fixed gear a^4 , the loose gear a^5 , the operating-pinion a^3 , the shaft extending above the upper surface of the gear a^5 and providing a centering support for a nail feeding and loading plate, and said nail feeding and loading plate having a hole for the reception of 75 the end of said shaft and connected with the gear a^5 to be turned thereby.

14. The combination of the shaft, the fixed gear a^4 , the gear a^5 loose upon the shaft, the 80 arm a^2 carrying the pinion a^3 which engages the teeth of the gear a^4 , a^5 , and is fixed to said shaft and an edge cam carried by said arm to be rotated therewith, the nail holding and feeding plate engaged by the pinion a^5 and 85 the cover-plate actuated by said revolving cam.

15. The distributor herein described, having the plate b in which is formed one or more lines of holes to register with one or more 90 lines of holes of the nail holding or feeding plate, integral extensions b' united at their lower ends by the integral ring b^2 and the removable plate b^3 attached to said extensions or frame and having holes of any desired arrangement therein, and tubes connecting the 95 holes of the plate b with the holes of the plate b^3 .

16. The combination in a distributor of the plate b having the extensions b' and ring or 100 frame b^2 with the plate b^3 .

17. The skimmer having upon its under surface the parallel flanges h^3 , with the cover 105 h having a tongue h' to engage the flanges.

18. A skimmer formed of a segmental block 105 having nail receiving and holding holes therein, and a segmental cover-plate secured to the block by an extension entering a straight recess or passage therein, and handles which hook upon the skimmer, as and for the purposes described. 110

19. The skimmer-block in the form of a sector having nail receiving and holding holes, and the skimmer handles secured to the ends and front of the block to extend outwardly 115 and forwardly from the front corners, substantially as described.

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