R. F. McFEELY.

NAIL SEPARATING MECHANISM.

APPLICATION FILED JULY 27, 1907.

1,002,422.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 1.

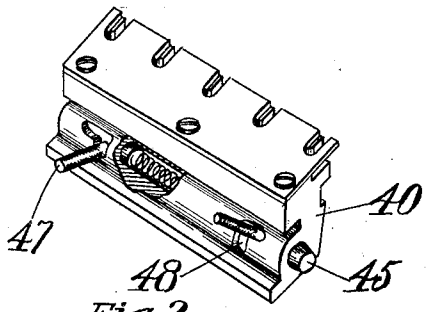

Fig. 2.

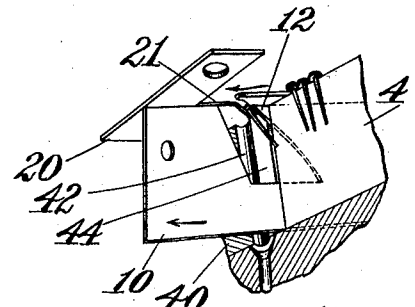

Fig. 7.

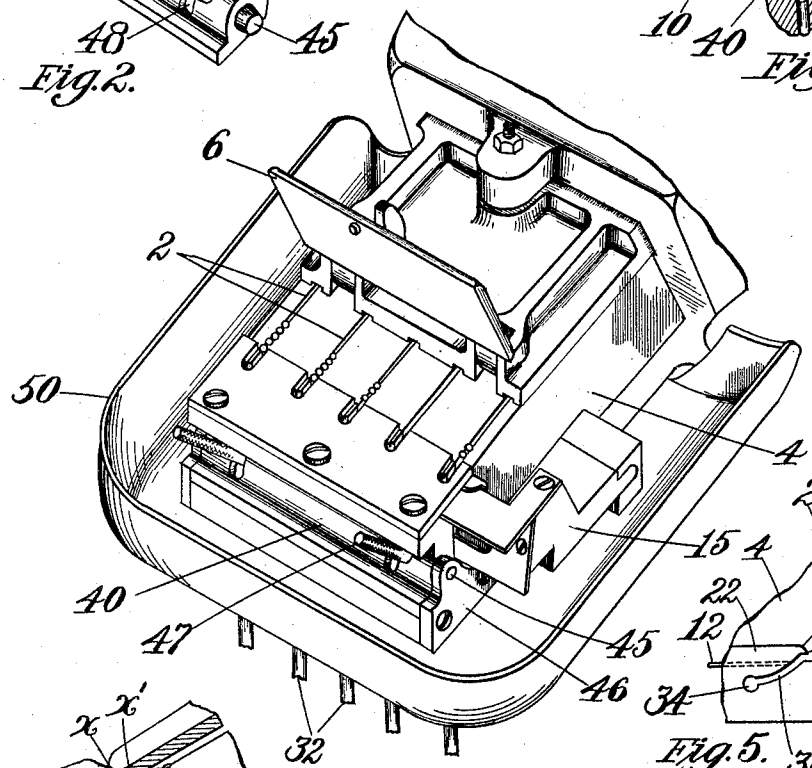

Fig. 1.

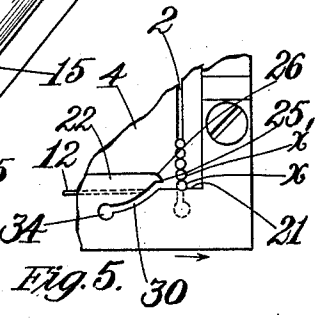

Fig. 5.

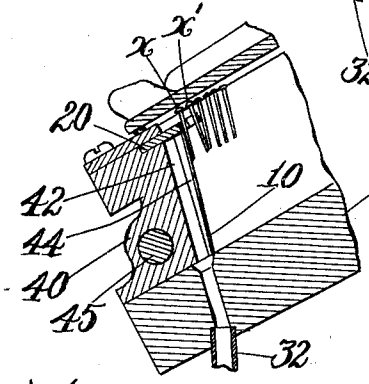

Fig. 3.

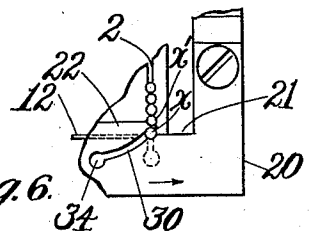

Fig. 6.

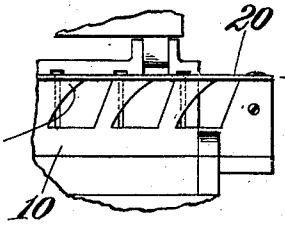

Fig. 4.

WITNESSES.

Meta G. Stevens

Elizabeth C. Coupe

INVENTOR.

Ronald F. McFeely

By his Attorney

Nelson W. Morris

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

R. F. McFEELY.

NAIL SEPARATING MECHANISM.

APPLICATION FILED JULY 27, 1907.

1,002,422.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 2.

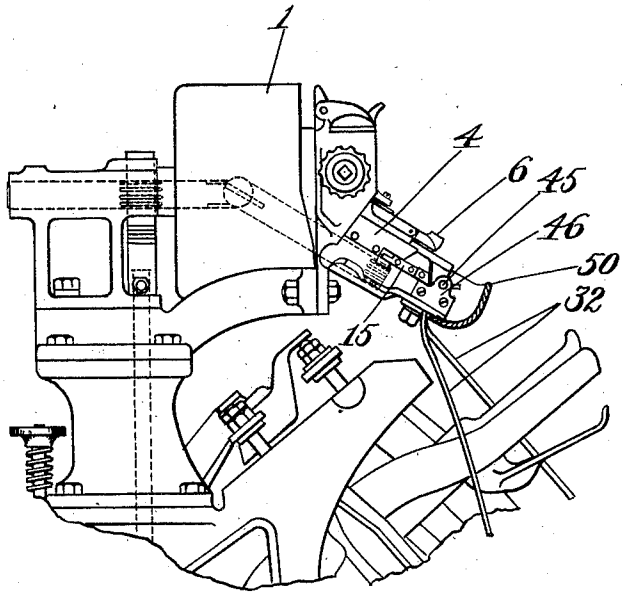

Fig. 8.

WITNESSES.

Meta B. Stevens

Elizabeth C. Coyle

INVENTOR.

Ronald F. McFeely

By Kirkpatrick & Brady

Nelson W. Ronald

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RONALD F. McFEELY, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

NAIL-SEPARATING MECHANISM.

1,002,422. Specification of Letters Patent. **Patented Sept. 5, 1911.**

Original application filed October 12, 1906, Serial No. 338,635. Divided and this application filed July 27, 1907. Serial No. 385,806.

To all whom it may concern:

Be it known that I, RONALD F. McFEELY, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Nail-Separating Mechanisms, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to mechanism for feeding nails or other articles, which will be herein referred to as "nails" for the purpose of describing the invention, and has for its object to provide an improved mechanism adapted to feed nails simultaneously in a plurality of raceways.

A particular object of the invention is to improve upon the nail feeding mechanism shown in my pending application Serial No. 209,957, and I have, therefore, shown the invention as embodied in a mechanism similar to that shown in said application.

In the use of mechanism of this class by which nails are separated and fed one at a time more or less clogging of the apparatus occurs because of the presence of oil, dust and grit among the nails and also on account of imperfectly shaped nails. This is more especially true in mechanism designed to feed small nails, such as lasting tacks. It is important to provide nail separating and delivering devices that shall operate with as few interruptions as possible from these causes and one object of this invention is to improve the construction and arrangement of the nail separating and delivering devices to this end. It is found, however, that it is impractical to avoid more or less stoppage of the nails in the separating mechanism from the causes mentioned and others and it therefore is important to construct and arrange the mechanism so that access may readily be had to the nail separating devices for ascertaining and correcting the trouble when the mechanism becomes clogged.

An important feature of this invention consists in nail feeding mechanism having devices for separating the endmost nail from a line of nails, and a member to or through which the separated nail is delivered having provision for the ready removal of said member to give access to the separating devices. In the illustrated embodiment of the invention the removable member, which will be herein designated as the end block, is provided with locking devices shown as spring plungers for securing it in operative relation to the separating devices. The locking devices are arranged with relation to the coöperating portions of the mechanism to wedge the block automatically into operative position and hold it securely until they are manipulated to release the end block. The practical importance of this provision of a readily removable end block giving access to the separating devices is multiplied in the embodiment thereof herein shown in which a single end block is arranged to coöperate with a plurality of raceways and their set of nail separating devices. By this provision of a single readily removable end block for a plurality of raceways, which in itself forms a feature of novelty in this invention, all the sets of separating devices are uncovered at the same time and when trouble occurs in the delivery of nails it is not necessary for the operator to trace the trouble back to the particular separating mechanism in which it has occurred and then remove a particular end block, for the removal of the one end block common to the several raceways discloses all the separating devices to him so that he can see the condition of each one.

Other features of the invention, including an improved construction and arrangement of the separating devices, and certain combinations of parts and details of construction will be explained in the following description and pointed out in the claims.

Figure 1 is a perspective view of a nail feeding mechanism embodying the present invention. Fig. 2 is a perspective view of the removable end block. Fig. 3 is a section through the mechanism in the plane of one of the raceways. Fig. 4 is an elevation of the separating devices uncovered by the removal of the end block. Fig. 5 is a plan view of the separating devices. Fig. 6 is a similar view of the separating devices in a different position. Fig. 7 is a perspective view of the separating devices in the act of segregating the lowermost nail from a line of nails and delivering it, the

relative position of the parts disclosed being one which occurs shortly after that shown in Fig. 6. Fig. 8 is a side elevation of the upper portion of a machine equipped with this invention.

The nail feeding mechanism in which the actuator is shown as embodied is designed for use in providing nails for pulling-over machines of the type shown in United States Letters Patent No. 663,777, in which nails are driven simultaneously by a plurality of inserting mechanisms. A view of the upper portion of this machine is shown in Fig. 8, the hopper being indicated at 1. A plurality of raceways or grooves 2 are provided in the raceway block 4, the lower portions of the several raceways being covered by the hinged plate 6.

The nail separating devices comprise a sliding gate plate 10, larger than the raceway block and provided with a gate 12, for each raceway, the several gates preferably for convenience in construction being formed integral with the plate. The gates are each formed with an inclined, preferably curved front edge terminating in a point at the upper end. The gate is guided with one side in contact with the lower end of the raceway block as shown in Figs. 3 and 7, the gate standing in a plane approximately parallel to the plane in which the depending shanks of the nails in the raceway hang so that it may under normal conditions advance between the two nails without material friction. The gate is connected on its upper or raceway side with a slide 15 by or through which it is reciprocated by means not herein shown to open and close the raceways. The nail separating devices also comprise a separator blade 20 connected with and operated by the slide 15 and which is also longer than the raceway block and is provided with a nail seat 21 and a separator 22 for each raceway. The nail seat is formed by the upper edge of the blade in front of the separator. The separator comprises a thin finger the upper edge of which is above the nail seat. The finger has a nail separating point 25 and is inclined or curved at 26 from the point to its upper edge to form a wedging surface, which, as the finger enters between the shank of the lowermost nail x and the shank of the next nail x' in the line of nails in the raceway, will crowd up nail x'. As the incline 26 engages nail x' below its head it will tilt or incline the shank of that nail, as shown in Fig. 3, away from the shank of the lowermost nail x to make a clear way between the shanks of the two nails for the gate 12. The straight upper edge of the finger maintains the nail x' in this position until after the gate has passed between the two nails x and x', closing the raceway as shown in Fig. 7. This movement of the nail x' takes place while nail x remains stationary against its seat 21, it being preferable that the nail being separated shall hang straight in the raceway to avoid liability of its getting into an incorrect position which would interfere with its separation and delivery.

From the nail seat 21 there leads a guideway 30 for the nail x backwardly from the point 25 and downwardly in such a direction that as the separator advances toward the left in Figs. 5 and 6, the nail is forced along the raceway 2 past the gate 12 and into a position in or over the discharge opening leading to the distributer tube 32. The guideway 30 is of a width similar to that of the raceway groove 2 to receive the shank of the nail and suspend the nail at its head. At the lower end of the guideway 30 is the opening 34 which is large enough to permit the head of the nail to drop through it. The separator is arranged in a slideway formed for it in the raceway block and in the end block 40, as shown in Fig. 3, in a plane below the head supporting surfaces of the raceway. The discharge openings through which the nails are delivered by the separators are herein shown as formed in the end block 40 and are designated by the numeral 42. Preferably the discharge openings extend downwardly at an angle to the direction in which the shanks of the nails hang, being inclined toward the points of the nails. By thus forming the discharge openings at an inclination to the nails I find that the nails are more certain to be delivered and dropped freely into the openings without liability of clogging. For convenience in construction the discharge openings 42 are formed wholly within the end block and are connected with the grooves 2 in the raceway block by grooves 44.

The end block 40 which extends across the entire foot of the raceway block and contains the discharge opening for each of the raceways is removably held in operative position by sliding spring pressed locking pins 45 which engage with the edge plates 46 of the raceway block. The pins are formed with tapering ends which as they are pressed outwardly by their springs wedge into the openings in the edge plates and force the end block firmly against the raceway block and securely hold it. For convenience in manipulating the pins 45 they are provided with handles 47 extending outwardly through angular slots 48 in the end block. The handles may be turned into the offset portions of the slots to hold the pins in retracted position while retaining the end block and replacing it. The single end block coöperating with the several raceways and arranged for ready removal to give access to all of the separating devices is a great advantage in that it enables the oper-

ator to inspect all the nail separating mechanisms for locating the point when nails are clogged and correcting the difficulty, without removing bolts and screws as has heretofore been required.

As shown in Figs. 1 and 8 the nail separating mechanism is surrounded on its side edges and lower side by a pan or flanged shield 50 extending under its edges and arranged to receive all nails and other articles which may fall from the raceways or be taken out in dislodging misplaced nails and clearing the raceways. The provision of this flanged shield avoids liability of nails and other articles falling among the moving parts of the other mechanisms of the machine which are arranged below the nail separating and feeding mechanisms as is fully shown in the Letters Patent before referred to.

In the operation of the mechanism the parts start from a position of rest in which the separator and the gates are retracted as shown in Fig. 5 with the lower nail resting against the nail seat 21. In the advance movement of the gate and separator toward the right the separating point 25 first enters between the shanks of nails x and x' at a distance far enough below the heads of the nails to avoid obstruction by any fins or webs which may be present formed on the nails near their heads. As the point forces its way between the shanks of the nails it tilts the nail x' into an inclined position as shown in Fig. 3, swinging its point away from the point of nail x so that nail x may be entirely free to be moved toward the discharge opening. The tilting of nail x' also produces a clear path for the gate which follows the separator point in the relation shown in dotted lines in Figs. 5 and 6. In the continued movement of the separator the nail enters the guideway 30 and the gate advances across the raceway to close the raceway groove, and by the time the nail x reaches the opening 34 above the discharge opening 42 the gate has closed the raceway groove from the top downwardly to or approximately to its lower edge so that when the nail falls it will drop through a passageway closed on all sides and in which it will have no opportunity to turn across the passageway. In the reverse movement of the gate and separator the upper edge of the separator holds the nails in the raceway until the seat 21 comes opposite to it. Then the nails are free to slide down which they do with a little jar as nail x' comes against the seat 21 in the position of nail x.

While the separating devices are arranged to secure as certain and reliable delivering of nails as seems practical clogging or stoppage does occasionally occur. This is sometimes caused by oil, dust and grit getting among the nails and sometimes by imperfectly formed or crippled nails. When a nail fails to come in any one of the conductor tubes the operator can readily remove the end block by withdrawing the locking pins with the fingers of one hand. The removal of the end block discloses all the separating devices to the operator as may be seen in Fig. 4, whereby he can at once locate the trouble and have the readiest access to the parts for correcting it.

Having explained the nature of the invention and described a mechanism embodying it in the best form now known to me, I claim as new and desire to secure by Letters Patent of the United States:—

1. In a mechanism of the class described, the combination with a plurality of raceways, and nail separating devices coöperating with each raceway, of an end block common to the several raceways and constructed and arranged for ready removal whereby access may be had to all the separating devices, and means for locking the end block in operative position.

2. In a mechanism of the class described, the combination with nail separating devices, of an end block covering said devices and giving access thereto when it is removed, and a tapering spring-pressed locking pin constructed and arranged to wedge the end block into operative relation to the separating devices and secure it.

3. In a mechanism of the class described, the combination with a plurality of raceways, and nail separating devices coöperating with each raceway, of an end block common to the several raceways and provided with discharge openings to receive the nails delivered thereto by the separating devices, and spring-pressed tapering locking pins coöperating with locking plates at opposite ends of the end block to wedge the block into operative position and secure it.

4. In a mechanism of the class described, the combination with a raceway block having a nail groove, and a removable end block having a nail groove in continuation of the groove in the raceway block and a discharge opening, of nail separating devices located between the raceway block and the end block and constructed and arranged to force the nails one at a time through the groove in the end block and to drop them into the discharge opening.

5. In an apparatus of the class described, the combination with a nail raceway, of a nail separating device comprising a thin endwise movable plate having a seat for the lowermost nail in the raceway, a discharge eye through which the nail is dropped, a tack passage connecting the seat with the discharge eye, and a separating finger formed and arranged to be forced between the shank of said nail and the nail next above it, said finger having a slightly in-

clined upper edge formed to swing the shank of the upper nail away from the shank of the lower nail without bodily moving the line of upper nails which may be in the raceway and having also an inclined lower edge formed to force the shank of the lower nail in the opposite direction through the nail passage toward the discharge eye.

6. A machine of the class described, having, in combination with a raceway comprising a plurality of grooves in which nails are suspended by their heads, an endwise movable separator plate having a nail separating finger and an oblique nail passage for each raceway; and a gate plate arranged in a vertical plane substantially under the upper edge of the separator plate and having a notched upper edge presenting forwardly pointed fingers to extend between the shanks of the tacks being separated from the several raceway grooves and the remaining tacks, the notches in said gate plate being deep enough to permit the shanks of the nails to pass transversely of the gate; and means for reciprocating the separator plate and the gate plate.

7. A machine of the class described, having, in combination, a raceway provided with a plurality of grooves in which nails are suspended by their heads, a single separator plate common to all the raceway grooves and having a pointed separator finger and an oblique discharge passage for each raceway groove; a single gate plate, also common to all the raceway grooves, and having a notched upper edge presenting for each groove a forwardly pointed finger under and adjacent to the point of the separating finger; a block or head upon which said separator and gate plates are secured; and means for reciprocating the block.

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

RONALD F. McFEELY.

Witnesses:

CHARLES H. HOYT,

ARTHUR L. RUSSELL.