

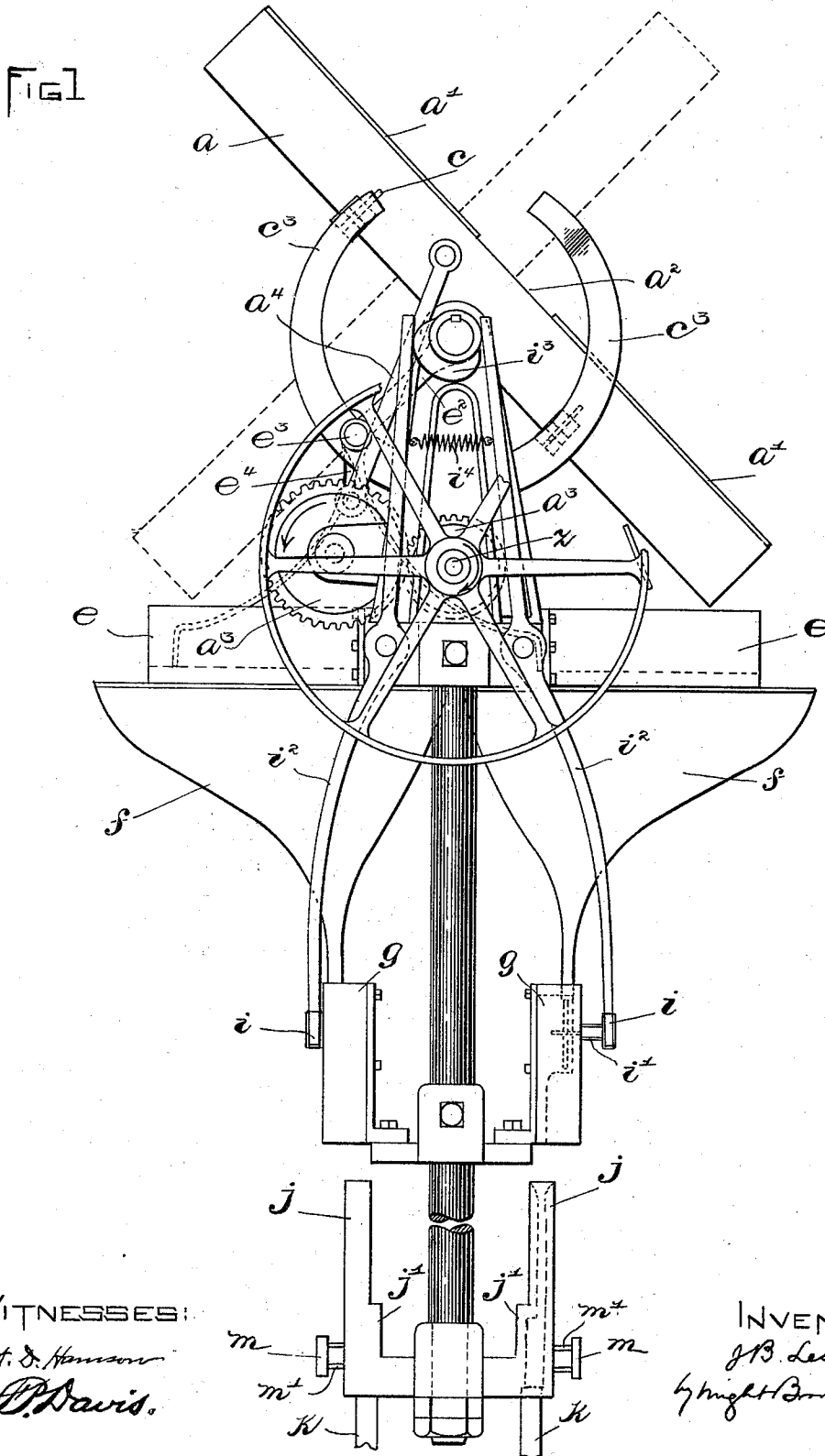
(No Model.)

3 Sheets—Sheet 1.

J. B. LESUER.
HEEL NAIL FEEDING MACHINE.

No. 541,861.

Patented July 2, 1895.



WITNESSES:

H. D. Hanson
D. Davis.

INVENTOR:

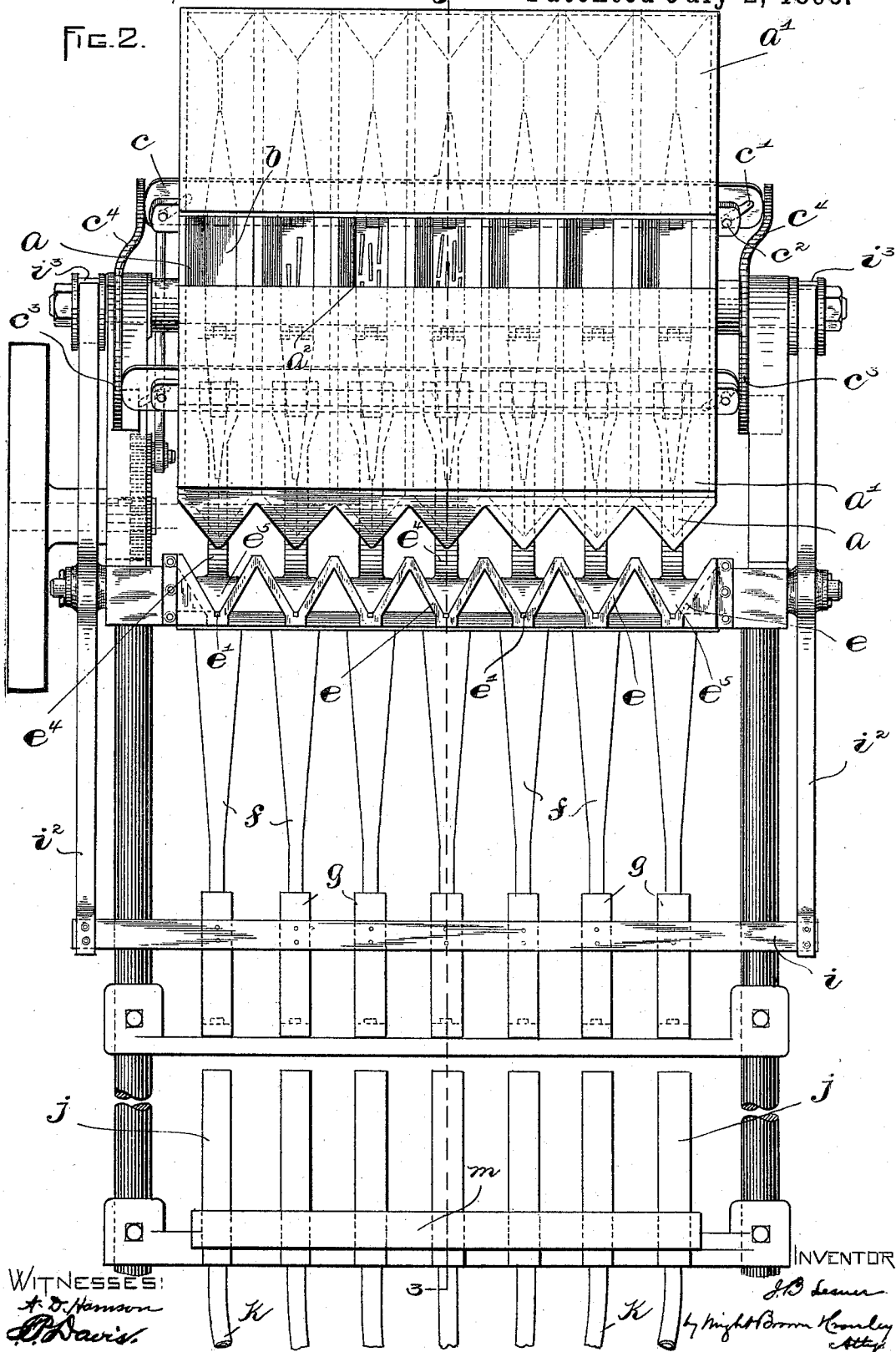
J. B. Lesuer
by Knight, Brown & Co.
Attys.

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FIG. 2.



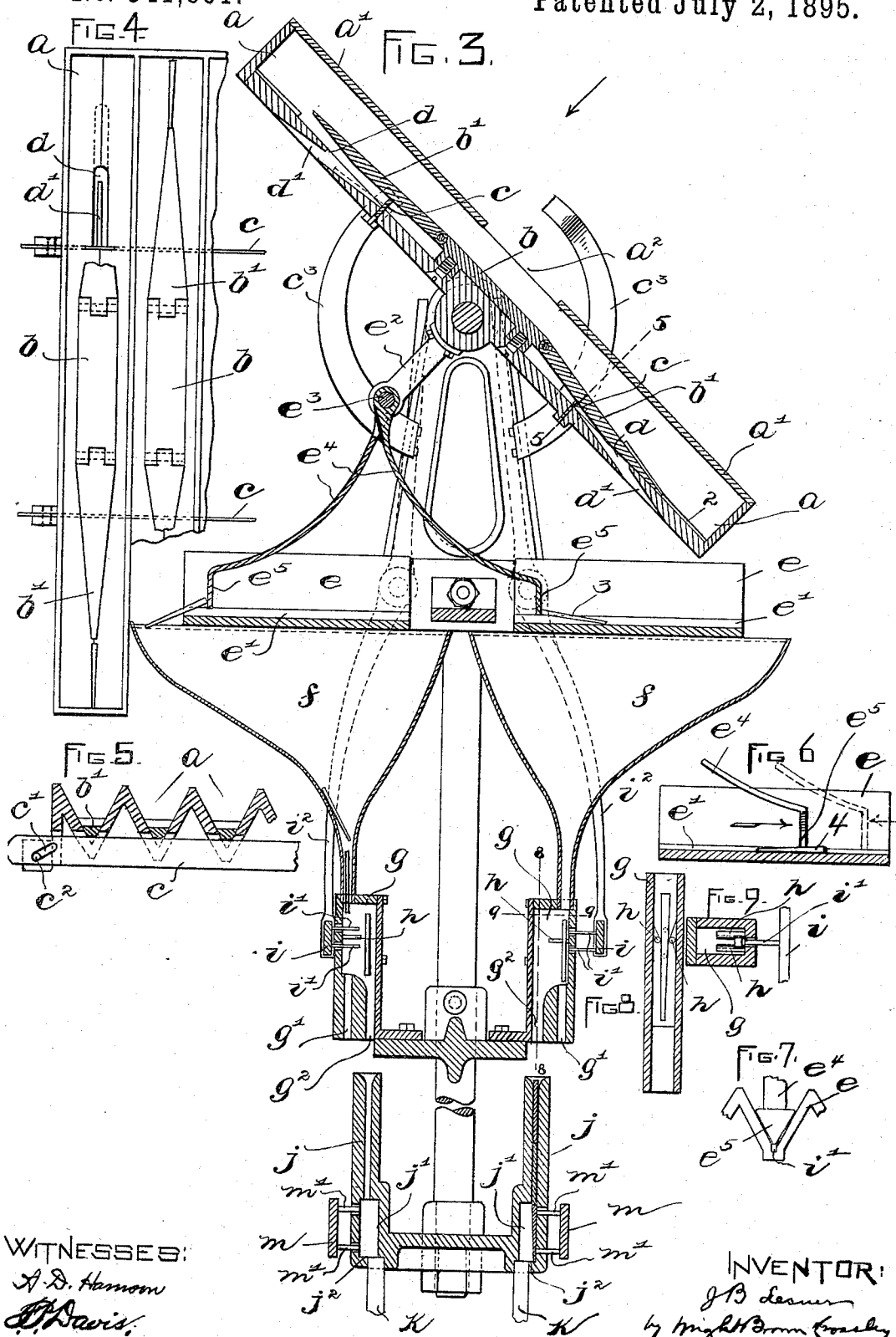
3

3 Sheets—Sheet 3.

J. B. LESUER.

Patented July 2, 1895.

No. 541,861.



WITNESSES:

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UNITED STATES PATENT OFFICE,

JOSEPH B. LESUER, OF SOMERVILLE, ASSIGNOR OF ONE-FOURTH TO FRANK E. REED, OF MEDFORD, MASSACHUSETTS.

HEEL-NAIL-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,861, dated July 2, 1895.

Application filed May 14, 1894. Serial No. 511,077. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH B. LESUER, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Heel-Nail-Feeding Machines, of which the following is a specification.

The object of the present invention is to provide an organized mechanism for feeding nails to heel-nailing machines employed in the manufacture of boots and shoes.

The invention involves provisions for singling out the nails from a supply of them, for disposing them point downward, for rejecting defective nails or slivers, and for supplying the nailing machine as the nails are wanted, all of which are fully described hereinafter, and their essentials recited in the appended claims.

The accompanying drawings which form part of this specification illustrate an embodiment of the invention.

Figure 1 shows the apparatus in side elevation. Fig. 2 shows the same in front elevation. Fig. 3 shows a vertical longitudinal section on line 3 3 of Fig. 2. Fig. 4 shows a top plan view of a portion of the magazine with parts broken away. Fig. 5 shows a section on line 5 5 of Fig. 3. Fig. 6 shows a longitudinal section of a trough with a nail therein and a brush illustrating an arrangement for insuring the nail's delivery point downward. Fig. 7 shows the same in end elevation. Fig. 8 shows a section on line 8 8 of Fig. 3. Fig. 9 shows a section on line 9 9 of Fig. 3.

A tilting magazine is employed the same being composed of a gang of elongated troughs, *a*, having inclined sides and covered by plates, *a'*, an opening, *a²*, being left at the middle for the introduction of a supply of nails. The magazine is pivotally supported at the middle and is oscillated so as to cause the nails to gravitate first toward one end and then toward the other end, its oscillations being effected through gearing, *a³*, connected with a driving-shaft, *z*, and a pitman, *a⁴*, connecting one of said gears with the magazine.

In the middle of each trough, *a*, is fastened a platform, *b*, and to each end of said platform

is pivoted a tongue, *b'*, the connecting hinge being so constructed that the nails will meet no obstruction in sliding over the same. The tongues, *b'*, have tapering sides so that they may incline from the platform, *b*, toward the bottom of the trough, and said sides are beveled to fit the sides of the trough. These tongues are also beveled on the under side near their free ends so as to fit against the bottom of the trough. Each tongue terminates a sufficient distance from the end of the trough to allow a single nail as 2, Fig. 3, to lie in the bottom of the trough between it and the end of the trough, and the end of the tongue is not brought quite to a point but forms an abutment for arresting this nail. It will be seen then that one end of the magazine having been tilted down and the nails all having gravitated to that end when the magazine is tilted to the opposite position one nail will be arrested and prevented from gravitating with the others. In this manner the nails are singled out from the mass of them in the trough. They are delivered one by one through means which will next be described.

On each side of the magazine's center of oscillation, a bar, *c*, is arranged in a transverse slot in said magazine below the tongues, *b'*, the said bar being designed to act against the tongues and move them away from the bottom of the magazine sufficiently to admit the arrested nails below them. Under each tongue a cavity or pocket, *d*, is made in the bottom of the trough to receive the nail when it slides under the tongue, and the bar, *c*, is located at the inner end of this cavity so as to constitute a wall against which the nail strikes and which prevents its escape from the cavity. A slot or chute, *d'*, leads from the latter through the bottom of the trough and extends obliquely toward the end of the trough, so that the nail may lie on the lower side of said slot when deposited in the pocket by the tilting up of one end of the magazine, but will not fall out until that end of the magazine is tilted downward when the nail will readily slide out.

The bars, *c*, are controlled through the following described means: Each of said bars is

formed near its ends with oblique slots, c' , which are engaged by pins, c^2 , fastened in ears on the magazine, so that endwise movement of the bar in one direction will produce a transverse movement thereof against the tongues, b' , and endwise movement of said bar in the opposite direction will produce transverse movement thereof away from the tongues to permit the latter resting in the bottoms of the troughs. Endwise movements of the bars are effected by means of segmental cam-strips, c^3 , fastened to the frame of the machine, there being two of such strips on each side of the machine at opposite ends thereof, and the ends of each bar, c , being designed to traverse a pair of the strips. The cam-strips have corresponding offsets, c^4 , near their upper ends, so that when one end of the magazine is tilted to its highest position the bar, c , at that end will be moved against the tongues, b' .

The operation of parts thus far described is as follows: The magazine being tilted one way the nails all gravitate to the low end, and a single nail lodges in the bottom of each trough between the end of the tongue, b' , and the end of the trough. The magazine is tilted in the opposite direction and all the nails in each trough except one will gravitate to the opposite end of the trough, that one, however, being arrested by the end of the tongue. As that end of the magazine containing the arrested nails nears the limit of its upward movement one end of the bar, c , encounters the offset portion of one of the segmental cam-strips and is moved thereby so as to act against the tongues, b' , and lift them away from the bottoms of the troughs. The arrested nails then slide under the tongues and into the pockets, d , assuming the position shown in broken lines in Fig. 3. The magazine then tilts to its other position and the nails deposited in said pockets slide out through the slots, d' . The same operations take place in each end of the magazine and a set of nails is delivered alternately therefrom.

Below each end of the magazine is arranged a series of troughs, e , corresponding in number and position with the magazine troughs and designed to receive the nails dropped therefrom. The troughs, e , have inclined sides and in the bottom of each trough is a nail channel, e' , whose width is equal to the thickness of the nail, and whose depth is less than the greatest width of the nail. It may be well to mention here that a heel-nail such as commonly employed in the manufacture of boots and shoes and such as this machine is designed to handle, has a uniform thickness throughout, and tapers in width, and the width at its large end is greater than its thickness.

The design in the construction of the channel, e' , is to have the large end of a nail project above the same no matter which way the nail falls into the trough. Thus should the nail 3, be deposited edgewise in the trough,

(see Fig. 3,) it will lie in the channel through part of its length only, and its large end will project above the channel being too wide to enter the same. On the other hand, should the nail, 4, dispose itself sidewise in the trough, (see Fig. 6,) it will engage the channel throughout its length but its large end will project from the channel by reason of the tapering width of the nail.

The troughs, e , are open at both ends and the nails are ejected therefrom according to which way they have position endwise in the trough, *i. e.*, a nail is ejected from that end of the trough toward which its point is directed so as to insure its further progress point-on.

The ejection of the nails from the troughs, e , is effected through the following described means: The oscillatory magazine is provided with centrally located pendent arms, e^2 , which support a transverse rod, e^3 , between their lower ends. Pivotaly mounted on said rod are a number of curved fingers, e^4 , there being one for each trough, e , and each being formed at its free end with a triangular head, e^5 , whose sides fit the inclined sides of the trough. The lower end of the triangular head is squared so as to be above the channel, e' . Oscillations of the magazine produce reciprocations of the fingers, e^4 , and cause the heads, e^5 , to traverse the troughs constituting brushes which will encounter anything protruding above the channel.

It will be observed that whichever way the nail may dispose itself in the trough, e , it presents an inclined side above the channel, e' , and also an end-surface at its large end, while its small end is always entirely within the channel. The brush or finger will, therefore, only act to move the nail along the trough when said brush or finger is moving in a direction to encounter the large end of the nail, for when moving in the opposite direction it will simply slide over the inclined side of the nail, being free to move on its pivot, and will not impart any movement to the nail. Hence the ejection of the nail end-on from the trough is assured regardless of the endwise position of the nail.

Below each trough, e , is a funnel-shaped chute, f , whose wide upper end extends sufficiently beyond the ends of the trough to catch a nail delivered from either end thereof. The contracted lower end of each of said chutes fits in the upper end of a chamber, g , adjacent to the front wall thereof, and there is a passage, g' , through the bottom of the chamber in alignment with the chute, and another passage, g^2 , out of alignment therewith, the stock between the passages being rounded off as shown. Just below the chute, f , a pair of round pins, h , are fastened in the front wall of the chamber, g , and they project horizontally and parallel with each other. The distance between the pins, h , is somewhat less than the thickness of the nail and consequently less than the greatest width thereof.

The distance is sufficient to admit the small end of the nail and allow the same to drop down through somewhat more than half its length, as shown in Figs. 3 and 8. The nail will always adjust itself edgewise between the pins. If it falls otherwise when it encounters the round surfaces of the pins it will turn and pass edgewise between the pins.

The object of the above described nail-arresting device is to prevent defective nails or slivers from being fed to the nailing machine. A sliver will pass down through the pins, *h*, and through the opening, *g'*, in the bottom of the chamber.

A nail is dislodged from the pins, *h*, and carried over the opening, *g'*, by the following means: A bar, *i*, extends along the front of all the chambers, *g*, on one side and carries pins, *i'*, which engage openings in the front walls of the chambers having location intermediate of the pins, *h*, so as to bring the pins in position to act on the arrested nails. The said bar, *i*, is supported between the lower ends of levers, *i''*, pivoted intermediate of their ends to fixed supports and their upper ends arranged to be acted on by cams, *i'''*, on the journals of the magazine. There being two sets of these levers the cams, *i'''*, are formed to act against them alternately under oscillations of the magazine. It will be seen that when said cams act against the levers the bar, *i*, carried by the levers, will be actuated toward the chambers, *g*, and the pins, *i'*, will push the arrested nails from between the pins, *h*. The nails then drop through the openings, *g'*, in the bottoms of the chambers. The bar, *i*, is retracted by a spring, *i''''*, connecting the opposed levers, *i''*. Below the openings, *g'*, are arranged barrels, *j*, to receive the nails and in which they are designed to be stacked end to end. The lower end of each barrel leads into a chamber, *j'*, having a ledge, *j''*, on which the lowermost nail rests. To one side of said ledge the tube, *k*, which is to receive the nail, enters the bottom of the chamber. The ledge, *j''*, is directly below the bore of the barrel, *j*, so that the nail is bound to fall on said ledge, and will be held there by the weight of the nails above it until displaced by devices hereinafter described.

The tubes, *k*, lead to the nailing machine and properly distribute the nails to the die in a well-known manner. A charge of nails is supplied to the tubes whenever desired by means of bars, *m*, extending along in front of the chambers, *j'*, and equipped with pins, *m'*, which fit through holes in the front walls of the chambers and are designed to act against the lowermost nails of the stacks and move them over to position above the tubes. When the bars, *m*, are moved inward their pins hold back the stacks of nails which cannot descend until the bars are retracted. These bars may be operated in any suitable manner.

The upper ends of the barrels, *j*, are intended to be below the lower ends of the chambers, *g*, a distance greater than the length of

a nail, so that when a barrel is full a nail dropping from the chamber above will fall over the side of the barrel.

The design is to have the singling out and pointing devices work faster than the nails will ever be required, so that the barrels, *j*, will always be kept full and will always have a reserve lot of nails stored up, and the machine will always respond to a demand for a detachment of nails.

It is to be understood that the invention is not confined to the embodiment thereof here shown, but is capable of being carried out in a variety of ways.

What I claim as my invention is as follows:

1. In a machine for feeding nails, a tilting magazine in the form of an elongated trough having a longitudinal outlet slot in the bottom extending obliquely from the upper to the under side thereof and toward the end of the trough; a movable cover extending over the said slot where it emerges from the upper side of the trough-bottom, and forming an abutment for a single nail lying in one end of the trough; and means for displacing the cover, when that end of the trough is elevated, permitting the arrested nail to gravitate into the oblique slot and lodge on one side thereof so that when the end of the trough is tilted downward the nail will slide out through the slot.

2. In a machine for feeding nails, a tilting magazine in the form of an elongated trough having a longitudinal nail-pocket in its bottom and a slot extending from said pocket obliquely through the bottom of the trough; a movable cover extending over the pocket and forming an abutment for a nail lying in one end of the trough; and means for displacing the said cover, when that end of the trough is elevated, permitting the arrested nail to gravitate into the pocket and lodge on one side of the oblique slot so that when the end of the trough is tilted downward the nail will slide out through the slot.

3. In a nail-feeding machine, a tilting magazine having inclined sides and an outlet opening in the bottom, a pivotal tongue extending over said opening and its free end arranged to present an abutment for a single nail in the end of the magazine, and means for moving the tongue away from the bottom of the channel to allow the arrested nail to pass under the tongue and into the outlet opening.

4. In a nail-feeding machine, a tilting centrally pivoted magazine having inclined sides and outlet openings in the bottom on opposite sides of the pivot, pivotal tongues extending over the outlet openings and the free ends of each arranged to lie close to the bottom of the magazine and arrest a single nail, and means for moving the said pivotal tongues away from the bottom of the magazine alternately when opposite ends of the magazine are elevated, substantially as described.

5. In a nail-feeding machine, a tilting magazine having inclined sides and an outlet

opening in the bottom, a pivotal tongue extending over said opening and its free end arranged to present an abutment for a single nail in the end of the magazine, a bar arranged to act against the tongue and located at the inner end of the outlet opening and means for actuating said bar to move the tongue away from the bottom of the magazine and allow the arrested nail to pass under it and against the bar and into the outlet opening.

6. In a nail-feeding machine, a tilting magazine comprising a gang of troughs each having an outlet opening in its bottom, pivotal tongues over said openings, a bar extending under said tongues, and means for moving said bar to simultaneously lift the tongues, substantially as and for the purpose described.

7. In a nail-feeding machine, a tilting magazine comprising a gang of troughs each having an outlet opening in its bottom, pivotal tongues over said openings, a bar extending under said tongues, and having oblique slots, pins on the magazine engaging said slots, and segmental cam-strips controlling the bar, substantially as described.

8. In a nail-feeding machine, a tilting centrally pivoted magazine comprising a gang of troughs each having outlet openings in its bottom on opposite sides of the pivot, pivotal tongues covering said openings and whose ends are arranged to lie closely in the bottoms of the troughs and constitute abutments for nails, transverse bars extending under the tongues, and means for moving said bars alternately against the tongues, substantially as and for the purpose described.

9. In a nail-feeding machine, a trough having a nail-channel in its bottom extending out of each end and of a width and depth each less than the greatest width of the nail and greater than the thickness thereof, whereby a nail lodging in the channel edgewise or sidewise will have its large end projecting above the channel while said nail lies horizontally in the channel with its point end resting on the bottom of the same; and a reciprocating brush engaging the trough above the channel.

10. In a nail-feeding machine, a trough having a nail-channel in its bottom of a less width than the large end of the nail, a tilting magazine with provisions for emitting nails singly to the trough, and a brush connected with the tilting magazine and adapted to traverse the trough.

11. In a nail feeding machine, a horizontal trough having a nail channel in its bottom of a width less than the large end of the nail, a chute below said trough and extending beyond each end of the same, a reciprocating brush arranged to traverse the trough, and means for delivering nails singly to the trough.

12. In a nail-feeding machine, the combination of a tilting magazine having provisions for emitting nails singly on opposite sides of its pivot, troughs under opposite ends of the

magazine and each having a nail-channel of a width less than the large end of the nail, and brushes arranged to traverse said troughs respectively and connected with the tilting magazine from which they receive motion.

13. In a nail-feeding machine, a trough having a nail-channel in its bottom of a width and depth each less than the greatest width of the nail and greater than the thickness thereof, whereby a nail lodging in the channel edgewise or sidewise will have its large end projecting above the channel; and a reciprocating pivotal brush arranged to traverse the trough above the channel.

14. In a nail-feeding machine, the combination of a tilting magazine having provisions for delivering nails singly, a chute which receives the nails, pins between which the nails are arrested, a lever having provisions for dislodging a nail from between said pins, and a cam on the journal of the magazine for acting against said lever.

15. In a nail-feeding machine, the combination of a tilting magazine comprising a gang of troughs with provisions for singly delivering nails, arresting-pins, a bar having provisions for dislodging the arrested nails, levers connected with said bar, and a cam on the journal of the magazine to actuate said levers.

16. In a nail-feeding machine, the combination of a tilting magazine comprising a gang of troughs with provisions for singly delivering nails from opposite ends; arresting pins; bars having provisions for dislodging nails arrested by said pins; levers connected with said bars and arranged in pairs extending on opposite sides of the journal of the magazine and connected by springs; and cams on the said journal arranged to co-act with the levers, substantially as described.

17. In a nail-feeding machine, the combination of a nail-receiving chamber having provisions for arresting an entering nail, and having two outlets one below the arresting devices and one offset, and means for dislodging the nail from the arresting devices and carrying it over the offset outlet.

18. In a nail-feeding machine, a barrel constructed to hold a stack of nails in vertical position end to end, and having an enlarged chamber at its lower end with a ledge on which the point of the lowermost nail bears; a vertical tube having an open upper end at the edge of said ledge; and means for moving the said nail bodily off the ledge and over the tube, the enlarged chamber at the lower end of the barrel permitting such movement of the nail.

19. In a nail-feeding machine, the combination of a receiving chamber having provisions for detaining the nails delivered singly to it, and two outlets one below the detaining devices and the other offset, means for dislodging a nail from the detaining devices and carrying it above the offset outlet, a barrel below the latter and adapted to contain a

stack of nails, said barrel having a shoulder
or ledge upon which the lowermost nail rests,
a tube communicating with the barrel, and
means for moving the lowermost nail off the
5 ledge and over said tube.

In testimony whereof I have signed my
name to this specification, in the presence of

two subscribing witnesses, this 8th day of May,
A. D. 1894.

JOSEPH B. LESUER.

Witnesses:

C. F. BROWN,
F. P. DAVIS.