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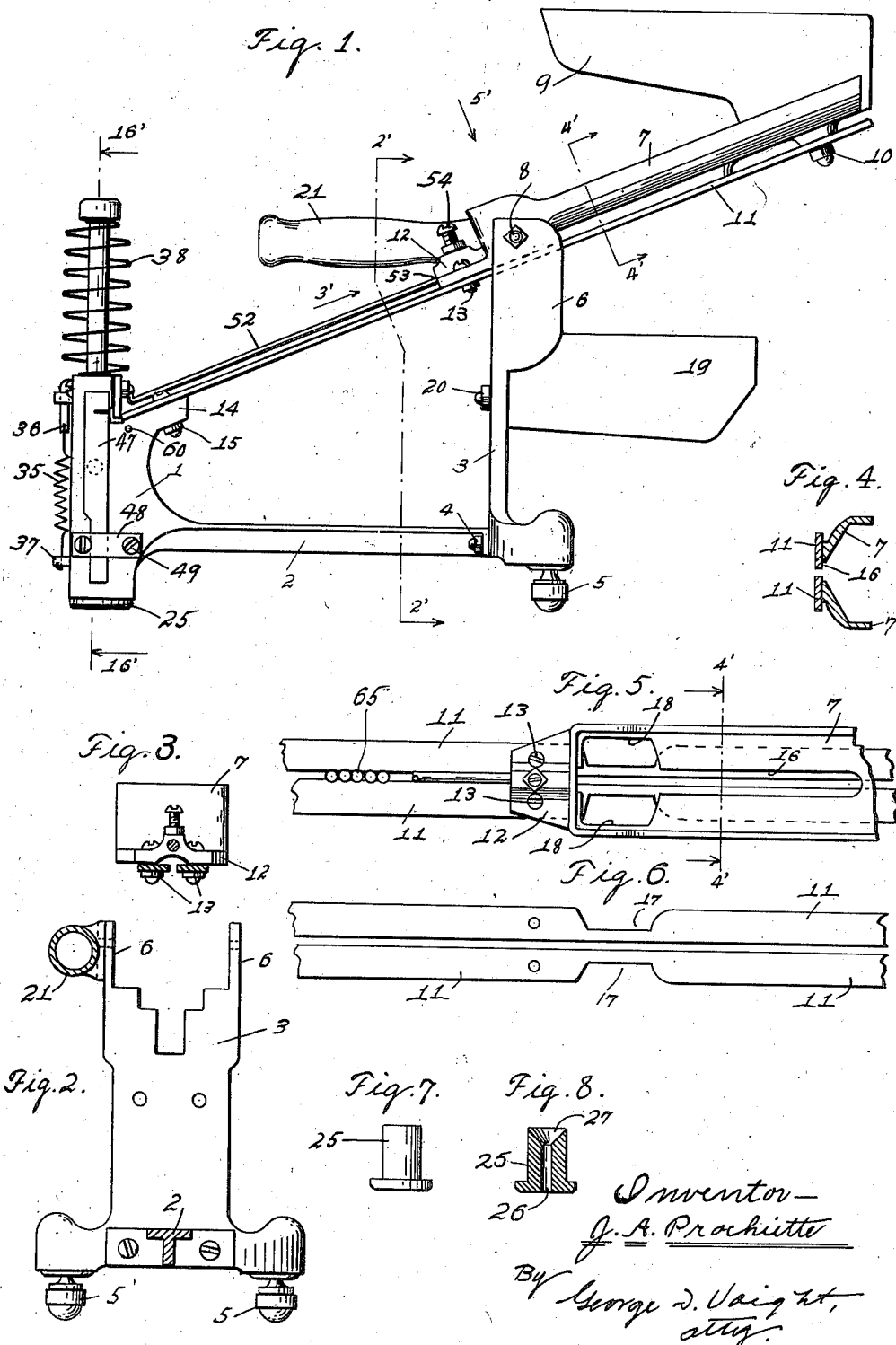
J. A. PROCHIETTE

2,058,034

NAILING MACHINE

Filed Dec. 10, 1934

3 Sheets-Sheet 1



Oct. 20, 1936.

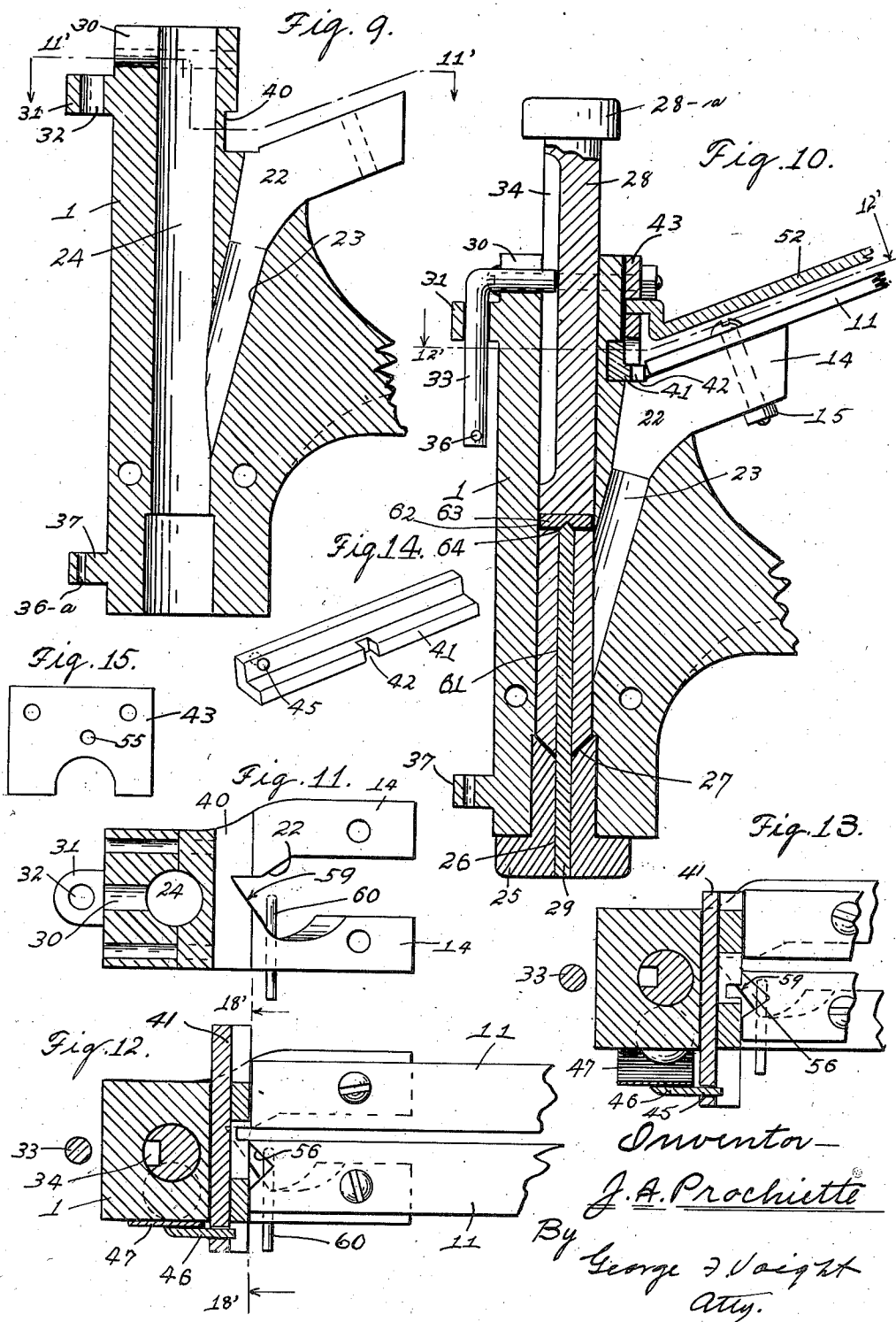
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Fig. 16.

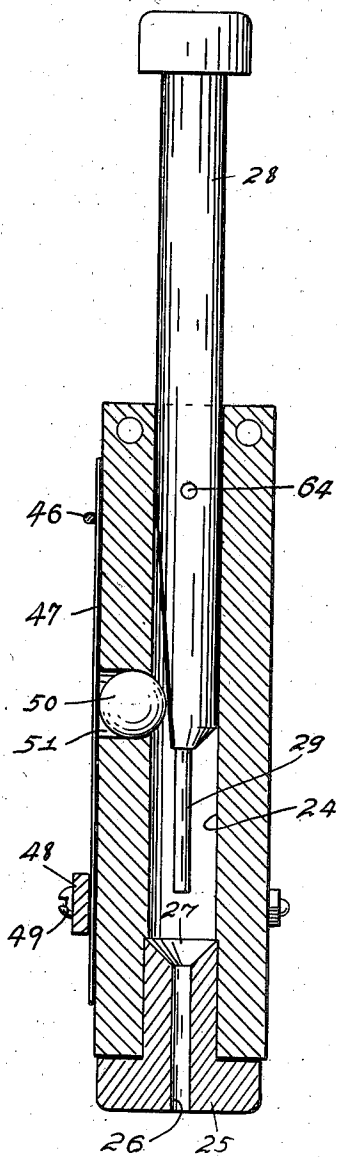


Fig. 17.

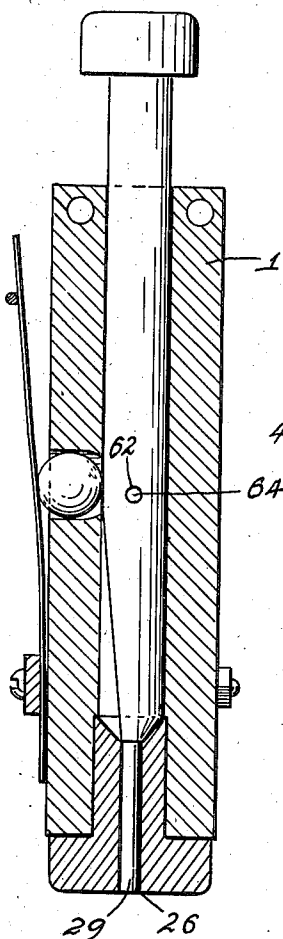


Fig. 18.

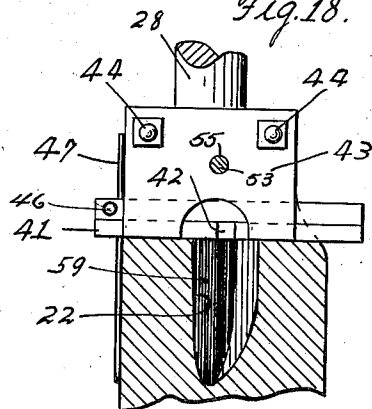


Fig. 19.

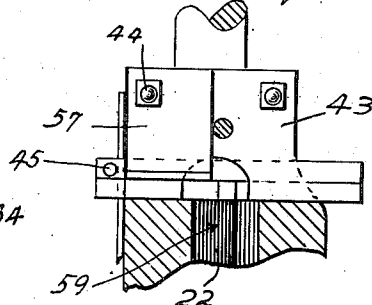
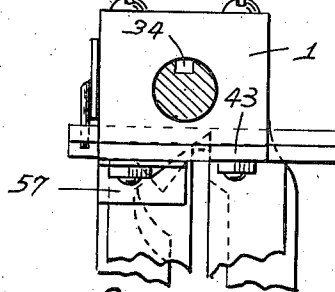


Fig. 20.

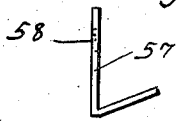


Inventor—

J. A. Prochietto

By George D. Voigt
Atty.

Fig. 21.



UNITED STATES PATENT OFFICE

2,058,034

NAILING MACHINE

Jean A. Prochiette, Berkeley, Calif.

Application December 10, 1934, Serial No. 756,867

6 Claims. (Cl. 1—46)

My invention relates to improvements in nailing machines and particularly to a portable machine for nailing the hardwood flooring superimposed on a primary floor.

5 One of the objects of the present invention is to provide a machine that is efficient in operation, inexpensive of manufacture, and one that will withstand long continued service.

With further objects and purposes in view 10 which will appear as the description proceeds, my invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodi- 15 ment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings—

20 Figure 1 is a side elevation of a nailing machine constructed in accordance with my invention;

Figure 2 is a cross section approximately on line 2'—2' of Fig. 1;

25 Figure 3 is a view of an intermediate portion of the machine, partly in section, looking in the direction indicated by the arrow 3', Fig. 1;

Figure 4 is a cross section on line 4'—4', Fig. 5;

30 Figure 5 is a top plan view of an intermediate portion, looking in the direction indicated by the arrow 5', Fig. 1;

Figure 6 is a plan view of the intermediate portion of the nail race;

Figure 7 is a view in elevation of the positioning die;

35 Figure 8 is a median sectional elevation of the positioning die;

Figure 9 is a vertical sectional view of the machine head;

40 Figure 10 is a sectional view of the machine head and parts associated therewith, portions of the latter being shown in elevation;

Figure 11 is a view on line 11'—11' of Fig. 9;

Figure 12 is a view on line 12'—12' of Fig. 10;

45 Figure 13 is a view generally similar to Fig. 12, but with certain parts disposed in operatively changed positions;

Figure 14 is a perspective view of the picker bar;

Figure 15 is a view in elevation of the guide plate;

50 Figure 16 is a vertical sectional view on line 16'—16', Fig. 1, with the plunger spring omitted;

Figure 17 is a view similar to Fig. 16, but with certain relatively movable parts operatively moved into altered positions;

55 Figure 18 is a view approximately on line 18'—18' of Fig. 12;

Figure 19 is a view similar to Fig. 18, but embodying a slight modification;

Figure 20 is a plan view of the modification of the invention; and

Figure 21 is a view in elevation of the nail-guiding plate, the application of which forming said modification.

Referring to the drawings in stricter detail, throughout which like reference characters designate like parts:

The numeral 1 designates the machine head, which is preferably cast en bloc with the extension 2, which is T-shaped in cross section and fixedly secured to the lower end portion of the standard 3, by means of securing bolts 4. 15

The standard 3, which is supported by casters 5, has its upper end formed to provide a pair of laterally spaced side plates 6, between which is fixedly secured the lower end portion of the inclined nail chute 7, by means of securing bolts 8. 20 The upper end of the chute supports a nail hopper 9.

To the under side of the upper end portion of the chute 7 are secured, by means of securing bolts 10, the upper ends of a pair of laterally spaced 25 nail-race plates 11, intermediate portions of which being fixedly secured to an extension 12 on the lower end of the chute 7, by means of bolts 13, while the lower ends of said plates are secured to lugs 14 by means of securing bolts 15. 30

The plates 11 form the inclined nail-race and between the space between said plates nails deposited in the hopper 9 are intended to operatively gravitate from said hopper to the machine head 1, and in so doing the nail heads are intended to 35 slidably engage the adjacent upper surfaces of the plates and from which the shanks of the nails are suspended between the plates. A slot 16 extending longitudinally along through the bottom of the forward end portion of the chute 7, which 40 slot is disposed in registration with the said space between the plates 11, permits the nails to freely gravitate from the hopper 9 through the chute 7 to and between the plates 11.

The lower end of the slot 16 is extended laterally and registers vertically with opposed cut-outs 17 formed in the margins of the plates 11, which extension and cut-outs form openings 18 45 through which refuse, defective nails, and the like, as well as regular nails that accidentally fail to enter the space between the plates, are intended to fall and to enter the refuse bin 19, which is secured, by means of bolts 20, to an intermediate portion of the standard 3. 50

To one side of the upper end of the standard 55

3 is fixedly secured a handle 21, by means of which the machine is intended to be moved in any direction along on the surface of the work being nailed.

5 In the machine head 1, between the lugs 14, is formed a recess 22, which converges downwards and terminates in an inclined opening 23, the lower end of which terminates in a bore 24 extending vertically through the head 1, which
10 said bore has its lower end enlarged diametrically and received therein the stem of a positioning die 25, which has a central vertically extending opening 26 terminating upwards in a concavity 27 formed in the upper end of said stem, which
15 said concavity receives the lower beveled end of a plunger 28, operatively slidable in said bore, for limiting the downward movement thereof. A driving pin 29, secured to the lower end of the plunger 28, is adapted to move slidably through
20 the opening 26 during the operation of the machine when the plunger is projected downwards as far as it is intended to go.

In the upper end of the head 1, at one side of the bore 24, is a notch 30, and immediately there-
25 below a projection 31 having a vertically extending opening 32 in which is slidably disposed the vertically extending arm of an L-shaped member 33, the other arm of the member being disposed to extend through the notch 33 with
30 the free end thereof projecting into a longitudinally extending groove 34 in one side of the plunger 28.

A coil spring 35 has one end secured in an opening 36 in the lower end of the member 33
35 and its opposite end secured in an opening 36a in a projection 37 at the lower end portion of the head 1. The spring 35 is intended to be secured under contractile tension whereby the pawl normally is held to seat against the bottom
40 of the notch 30.

A coil spring 38 encircling the upper end of the plunger 28 and confined under yielding contraction between the upper surface of the head 1 and the head 28a of the plunger, is adapted to
45 normally yieldingly maintain the plunger in its uppermost position as far as the member 33 co-acting with the coil spring 35 permits it normally to go. The spring 35 is intended to contain
50 sufficient tensile resistance to overcome any force normally exerted thereagainst by the spring 38, through the medium of the parts 28 and 33, but to yield somewhat to the tensile influence of the spring 38, and thereby permit the member 33 to move slightly upwards with the upward
55 movement of the plunger 28, after having contacted the latter in the lower end of the groove 34, during the abrupt rebound of said spring 38 and the sudden retraction of the plunger to its uppermost position after it had been impelled
60 downwards as far as it is intended to go and the spring 38 had been compressed to its greatest required degree. This yielding of the spring 35 during the sudden upshot of the plunger 28 and spring 38, imparts a certain cushioning effect to the contact between the member 33 and the
65 plunger. The member 33, in addition to forming a medium of connection between the springs 35 and 38, also functions for preventing rotation of the plunger 28 in the bore 24.

70 Across the inner face side of the head 1, at the margin of the recess 22, is a transversely extending rabbet 40 in which is longitudinally slidably disposed an L-shaped picker bar 41, the horizontally extending leg of which is dis-
75 posed in close slidable association with the lower

ends of the plates 11 and has its upper surface disposed at a distance below the upper surface of the latter as best shown in Fig. 10, being provided with a nail-receiving notch 42 normally in align-
5 ment with the space between the said plates 11 (Figs. 12 and 20).

A bar-retaining plate 43, secured across the inner face side of the head 1 by means of screw-
bolts 44, retains the picker bar 41 slidably in the rabbet 40.

10 An opening 45 in one end of the bar 41 (Fig. 13) receives the free end of a pin 46 fixedly secured to the upper end of a flat spring 47, the lower end of which is clamped against the side of the lower end portion of the head 1 by means
15 of a clamping plate 48 secured by screw-bolts 49.

One side of the lower end portion of the plunger 28 is chamfered as shown in Figs. 16 and 17, and a contact ball 50, which is freely movable in an opening 51 in one side of the head 1, and
20 which ball by the normal retraction of the spring 47 is caused to project a distance into the bore 24 when the plunger 28 is in its uppermost position (see Fig. 16), is engaged by said chamfered
25 portion, during the downward stroke of the plunger, and forced outwards against the spring 47, causing the latter to resistingly yield and to be deflected outwards and by means of the pin 46, which projects into the opening 45 in one
30 end of the bar 41, to draw the latter in the same direction.

A nail-retaining rod 52, which has one end fixedly secured in an opening 53 in the extension
35 12, by means of screws 54, and its opposed end disposed in an opening 55 in the bar-retaining plate 43, extends centrally above and in adjacent parallelism with the space between the plates. The rod 52 is adapted for preventing nails sliding
40 down the nail-race from being forced upwards out of the space between the plates 11.

59 designates a portion of the wall of the recess 22 extending obliquely across the line of travel
45 of the picker bar 41, which wall portion is adapted to be engaged by the nail in the notch 42 during the outward longitudinal movement of the said bar, for forcing it out of the notch and there-
50 by permitting it to drop into the recess 22.

In the margin of the lower end of one of the plates 11 is cut-out 56, which is intended to provide
55 room for the movement of the nails as they are forced out of the notch 42 and into the recess 22.

In the modification shown in Figs. 19, 20 and 21, there is provided a nail-retaining plate 57, one
55 portion of which has an opening 58 through which projects one of the screw-bolts 44 whereby it is secured to the outer face of the bar-retaining plate 43, the other portion thereof overlies the cut-out 56. The function of the plate 57 is to prevent any nail while being forcibly ejected from
60 the notch 42 by striking against the oblique wall surface 59, from being accidentally projected upwards through the cut-out 56.

60 indicates a guard pin projecting horizon-
65 tally through one of the lugs 14 into the recess 22 a distance such that it will be engaged by the nail in event the latter is accidentally forced too great a distance in the direction of the plates 11 during its ejection from the notch 42 by engagement with
70 the oblique wall portion 59.

The driving pin 29 is adapted to fit sufficiently tight in the opening 61, extending axially into the lower end of the plunger 28, to be retained
75 in its proper position therein during the opera-

tion of the machine, but removable therefrom when proper force is applied thereto in event it is required for replacement with a new pin, which requirement may be occasioned by wear or breakage of the old pin, or in event it is desired to remove the latter for any other reason. To facilitate such removal of the driving pin, there is provided an opening 62 extending transversely through the plunger 28 and intersecting with the upper end of the opening 61, in which transverse opening 62 is disposed a cross-pin 63, in the lower mid portion of which is an indentation 64 in which projects and seats the upper end of the driving pin 29, which by reason of its projection into said indentation will be caused to move slightly longitudinally downwards by said cross-pin when the latter is forcibly projected longitudinally out of said transverse opening 62. Further downward movement of the driving pin 29 may thereafter be effected by inserting one end of an appropriate tool, such, for instance, as a punch, in the opening 62 for engagement with the pin, and then employ the tool in the manner of a pry fulcrumed against the upper margin of said opening. Obviously, the said tool must have sufficient play in the opening 62 to permit of its use as a pry. The driving pin may then be readily removed by engaging with appropriate means that portion thereof projecting below the lower end of the plunger 28.

The seating of the upper end of the driving pin 29 in the indentation 64, is also intended to limit longitudinal movement of the cross-pin 63 in the opening 62 and thereby prevent it from projecting outwards beyond the face of the plunger where it might interfere with the proper movement of the latter by scoring the wall of the bore 24, or otherwise.

The reference character 65, Fig. 5, indicates the heads of a small cluster of nails suspended by their heads between the plates 11.

The driving pin 29 during the downward movement of the plunger 28 is adapted to engage the head of the nail deposited in the opening 26 during the last previous cycle of operation of the machine and project it a proper and prearranged distance into the flooring, or other work, operated on.

The positioning die 25 is removable from the opening 24, and several dies of various stem lengths are preferably provided for each machine, thus permitting of the selection of a nose member corresponding in length to that required for driving nails flush with the upper surface of the flooring (Figs. 10, 17), or of a nose member shorter than that portion of the driving pin extending below the plunger 28. In the latter instance the driving pin would obviously project some distance below the nose member when the plunger is seated in the concavity 27 and the nails driven would be projected below the upper surface of the flooring.

To operate the present machine: A suitable supply of nails to be driven is deposited in the hopper 9, which nails by reason of the vibrations of the machine during the operation thereof gravitate from the hopper to the chute 7 and through the slot 16 to the race plates 11, thence into the space therebetween and suspended by their heads from said plates. In this suspended position the nails slide along down to the lower ends of the plates 11 into contact with the notch 42 in the bar 41. With the nail now in the notch 42, the plunger 28 is by a single stroke of the operating mallet or hammer directed against the

head 28a, projected downwards to seat in the concavity 27. In this downward movement of the plunger, its lower beveled portion engages and forces the ball 50 outwards against the spring 47, causing the latter and the picker bar 41 connected thereto to move in the same direction. The said movement of the picker bar causes the nail heretofore deposited in the notch 42 and carried along with the bar to abruptly engage the oblique wall portion 59 and to thereby be forced out of said notch to drop into the opening 23 where it engages the side of the plunger whereby it is halted until the next upward movement of the plunger when it passes through the bore 24 into the opening 26 in the nose member 25. During the retraction of the plunger towards its normal or uppermost position under the influence of the spring 38, and its lower end has passed clear of the opening 23, the nail mentioned as having been temporarily halted therein by engaging the plunger, now slips through the bore 24 into the opening 26, and as the plunger proceeds to rise to its said normal or uppermost position, the ball 50 retreats inwards impelled by the spring 47 to move the bar 41 longitudinally backwards into its normal position with the notch 42 in alignment with the space between the plates 11, which movement and retraction of said parts and the re-alignment of the notch 42 with said space, now permits or causes the lowermost nail now in said space to fall into said notch.

The movement of the plunger 28 from its normal or uppermost position to its lowermost position and return to said normal or uppermost position, constitutes one complete cycle of operation of the machine, and during each of said cycles a nail is normally intended to be driven into the object worked upon.

I claim:

1. In a nailing machine of the character described, a machine head having a bore extending vertically therethrough, a nose member in the lower end of said bore, a plunger vertically movable in said bore and seatable against said nose member for limiting the vertical movement of said plunger in one direction, a spring secured to one side of said head, and means disposed in an opening in said side coactable with said plunger and engageable with said spring whereby a certain vertical movement of said plunger will cause said means to engage and deflect said spring.

2. A machine head having a bore extending vertically therethrough, a plunger vertically movable in said bore, said plunger having a longitudinally extending groove, an L-shaped member having its lower extremity resiliently connected to said head and its upper extremity disposed in said groove, said member adapted for limiting the longitudinal movement of said plunger in one direction and a coil spring for impelling said plunger upwards as far as it is normally intended to go.

3. In a nailing machine of the character described, a nail race comprising a pair of plates disposed in lateral spaced parallelism, and a nail chute disposed above said race and fixedly secured thereto, said nail race having ambilateral cut-outs adjacent its mid portion, said cut-outs registering vertically with an opening in the bottom of said nail chute.

4. In a nailing machine of the character described, in combination, a plunger having a longitudinally extending opening in its lower end portion, a transversely extending opening intersecting with the upper end of said first named

opening, a cross-pin disposed in said transversely extending opening, said cross-pin having an indentation in its mid portion, and a driving pin disposed in said longitudinally extending opening and having its upper end disposed in said indentation, the axis of said cross pin extending at right angles to the axis of said driving pin.

5 5. In a machine of the character described, a machine head, a plunger longitudinally vertically movably supported by said head, an L-shaped member having one end portion disposed in a vertically extending groove in said plunger and having its opposite end portion secured to a spring connected to said head, said L-shaped member and spring cooperating to provide means for resiliently limiting upward movement of said plunger relative to said head.

6. In a nailing machine of the character described, in combination, a machine head having a bore extending vertically therethrough, a plunger longitudinally slidable in said bore, said plunger having a transversely extending opening in its midportion, a cross-pin confined wholly within the limits of said transversely extending opening, whereby said plunger is permitted unrestricted longitudinal movement in said bore while disposed in close juxtaposition to the inner surface thereof, said plunger having a longitudinally extending intersecting with said transversely extending opening, and a driving pin in said longitudinally extending opening, the upper end of said driving pin disposed in an indentation in said cross-pin.

JEAN A. PROCHIETTE.