

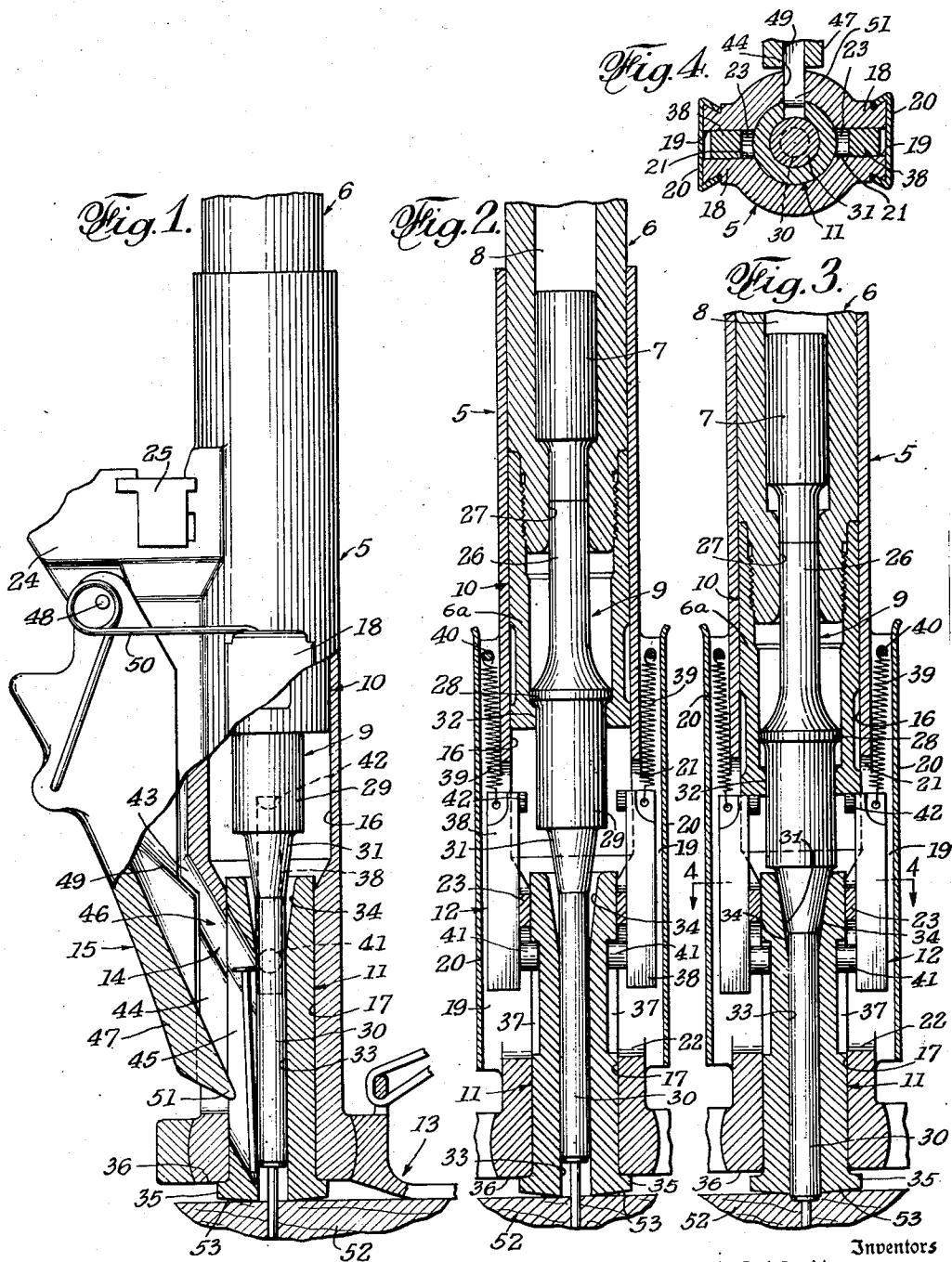
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NAIL-DRIVING MACHINE WITH MOVABLE NOSEPIECE

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NAIL-DRIVING MACHINE WITH MOVABLE NOSEPIECE

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This invention relates to improvements in nailing machines and deals more particularly with nail-guiding and board-depressing means embodied in the lower operative end of such machines. The general type of nailing machine in which the present improvements are adapted to be embodied is disclosed in Patent No. 2,546,354.

Jamming of nailing machines often occurs because of faults and/or variations in the nails being handled and for other reasons. It is desirable, therefore, that provision be made for quickly and easily clearing the machine of a faulty nail so that successive driving of nails not be unduly interrupted. It is an object of the present invention to provide in a nailing machine of the character indicated, means to effectively guide nails to a position from which they are driven and embodying in said nail-guiding means, means affording ready access for clearing a faulty nail from the machine.

Frequently, the board being nailed in place is not firmly seated against the member to which it is to be secured by the nails driven by the machine. The machine itself may often hold such a board in place. However, to insure firm seating of the board while a nail is being driven and eliminate the need for the operator to press down unduly hard, it is another object of the invention to provide a board-engaging nose-piece that is power driven downwardly to press against the board being nailed by the nail-driving pin to, thereby, utilize the power that operates said pin to press the board down.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes one embodiment of the present invention which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

Fig. 1 is a side elevational view, partly in longitudinal section, showing the lower operative portion of a nail-driving machine embodying the present improvements.

Fig. 2 is a longitudinal sectional view of said machine portion taken at right angles to the showing of Fig. 1.

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Fig. 3 is a similar view showing the manner in which the driving pin transmits its force to the board-depressing nose-piece.

Fig. 4 is a cross-sectional view as taken on line 4—4 of Fig. 3.

The present improvements are embodied in and carried by a barrel 5, the same having therein the manually reciprocating body 6 of a pneumatic gun. Said body, per se, forms no part of the present invention and, as shown, includes an air-operated piston 7 reciprocable in longitudinal bore 8.

The means of the present invention comprises, generally, a nail-driving pin 9 that is operated on by piston 7, a retainer 10 for said pin 9 and carried by the lower end of gun body 6, a board-depressing nose-piece 11 in the barrel and operatively engaged by said driving pin to be projected thereby beyond the lower end of the barrel, means 12 to retract and retain said nose-piece and against the force of which the nose-piece is projected, a stirrup 13 connected to the lower end of the barrel and affording means for holding said barrel in position during a nail-driving operation, means 14 to guide nails to a position from which they are adapted to move into the nose-piece 11, and retractable means 15 affording access to the guide means 14.

The barrel 5 is provided with an upper bore 16 in which gun body 6 reciprocates and a smaller lower bore 17 in which nose-piece 11 reciprocates. At its lower end, said barrel mounts stirrup 13 which extends laterally as shown in Fig. 1. It will be understood that a foot in said stirrup is employed to hold the barrel against movement while a nail is being driven and that the same affords means to guide shift of the machine to another nail-driving position.

As seen in Figs. 2, 3, and 4, the barrel 5 is formed with opposite lateral extensions 18 and that said extensions are each provided with a longitudinal slideway 19 enclosed, at the outside, by a removable cover 20. Inward of each slideway the barrel is formed to have opposite upper and lower vertical slots 21 and 22, respectively, that are separated by a transverse wall 23. Said slots afford communication of the slideways 19 with the bores 16 and 17.

While forming no part of the present invention, the barrel is formed with a lateral enlargement 24 in which is guided a nail selector 25 which, for each successive cycle of operation of the machine, releases a nail, supplied thereto, for movement in the guide means 14.

The nail-driver 9 that is illustrated comprises an upper shank 26 that is guided in a reduced

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lower end bore 27 of the gun body and adapted to be engaged and driven downwardly by piston 7 during reciprocation of said piston by pneumatic means provided, an annular shoulder 28 at the lower end of said shank, a body portion 29 below said shoulder, a lower nail-driving shank 30, and a conical portion 31, between the lower end of body portion 29 and the upper end of shank 30. Said nail driver comprises an integral element formed substantially in the above-described manner.

The retainer 10 comprises a lower extension 6a of gun body 6 and, at its lower end, said extension is provided with an inreaching flange 32 that constitutes a support for shoulder 28 of the nail driver when the gun body 6 is telescopically raised relative to barrel 5.

The nose-piece 11 is slidably fitted in bore 17 and has a longitudinal bore 33 in which shank 30 of the nail driver operates. The upper end of said bore is conically flared at 34 to receive conical portion 31 of the nail driver 9. As best seen in Fig. 3, said flare 34 is at a steeper angle with respect to a plane normal or transverse to the length of driver 9, than the slope of the sides of conical portion 31. Therefore, the base or larger part of conical portion 31 engages the wider end of the flare 34 on a circular line of contact, to obviate seizure or jamming between the nail-driver 9 and nose-piece 11 when the former is percussed downward by piston 7 and is engaged with the nose-piece to similarly percuss the latter in a downward direction. The lower end of said nose-piece is provided with an annular flange 35 that engages the lower face 36 and limits the upward movement of said nose-piece in bore 17. On opposite sides, said nose-piece is provided with longitudinal recesses 37 intermediate its length.

The nose-piece retracting and retaining means 12 is shown as a pair of similar retainer bars 38 that are slidably disposed in slideways 19, springs 39, connected to the upper ends of said bars and to cross pins 40 in the slideways to, at all times, urge said bars in an upward direction. Said bars, at their lower ends, are each provided with an inwardly directed pin 41 and said pins extend through slots 22 into recesses 37 of the nose-piece 11. At their upper ends, said bars 38 are each provided with an inwardly directed projection 42 and said projection extends through slots 21 into the path of movement of retainer 10.

The nail-guiding means 14 comprises a fixed chute 43 formed in barrel 5 and terminating in a slot 44 in said barrel adjacent its lower end. Said chute and slot are phased 90° with respect to slideways 19, as shown in Fig. 4. Said means 14 further includes a slot 45 in nose-piece 11 held in alignment or register with slot 44 by the pins 41 of the nose-piece retainer means 12.

Since nail selector 25 releases the nails so they fall point downward in chute 43 and through slot 44 into slot 45, said two slots are enlarged at 46 to accommodate the heads of said nails as they come to rest against nail-driver shank 30 while the latter is driving a nail.

The retractable means 15 comprises a nail chute 47 hinged at 48 to barrel enlargement 24 and having a passage 49 cooperating with chute 43 to guide nails to the position shown in Fig. 1. A spring 50 resiliently urges means 15 to enclose the effective portions of the nail-guiding means 14. A lower projection 51 on chute 47 extends into slots 44 and 45 to constitute a guiding means directing the points of the nails to the bottom of slot 45.

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While spring-urged to be retractable, the means 15 normally comprises a stationary chute part and has no movement on its hinge 48 during normal operation. However, should a nail become jammed in the mechanism, said nail can be reached for extraction by swinging chute part 15 outwardly and exposing the nail guide 14.

In the operation of the machine, the gun body 6 is pulled upward to bring the lower end of the nail-driver shank 30 above the nail that has been intercepted by said shank. Said nail will then fall into bore 33 with its point resting on the board or plank 52 into which the nail is to be driven. Now, while the stirrup 13 is used to hold the barrel stationary, air-impelled reciprocation of plunger 7 is instituted by manual actuation of a suitable trigger. Simultaneously, the gun body 6 is depressed by the operator. Fig. 2 shows an intermediate position wherein the nail is partly driven into board 52. The foregoing generally follows the operation of a nailing machine such as exemplified in the above-mentioned patent.

Before the nail has been completely driven home, the conical portion 31 of the driver engages the flared seat 34 of the nose-piece to impart to the latter the percussive force of piston 7. Thereafter, the nail-driver and said nose-piece move downwardly together under the successive blows of piston 7. When the nail has finally been driven home, as shown in Fig. 3, the nose-piece has firm bearing on board 52, and assurance is had that said board is snugly depressed against the member to which it is secured by the nail.

It will be noted that the end of driver shank 30 always has the same relationship to the board-engaging surface 53 of the nose-piece when the driver and nose-piece are engaged. Consequently, said shank cannot be projected to drive the head of the nail an inordinately great distance through board 52 because said surface 53 offers too great a resistance to penetration into the board.

Since the force of the piston 7 is here utilized to press the nose-piece 11 against the board being nailed, the operator need not exert a downward force on the machine, but need merely to guide the same downward. Consequently, the present means eases the operation of the machine materially.

While we have illustrated and described what we now contemplate to be the best mode of carrying out our invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what we claim and desire to secure by Letters Patent is:

1. In a nail-driving machine having a barrel and provided with a power-percussed nail-driver movable along the axis of said barrel, a nose-piece slidably fitted in said barrel and having a longitudinal through bore through which said driver extends, resilient means retracting said nose-piece into the barrel, and cooperative portions on the driver and nose-piece and engageable during percussive movement of the driver to impart the power-percussed force of the driver to the nose-piece to project the latter against the force of the retracting means.

2. In a nail-driving machine according to claim

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1: said cooperative portions comprising a conical portion on the nail-driver and a flared seat in the nose-piece.

3. In a nail-driving machine according to claim 1: said cooperative portions comprising a conical portion on the nail-driver and a flared seat in the nose-piece, the angle of slope of the face of said conical portion being greater with respect to a plane normal to the length of the driver than the angle of slope of the face of said seat.

4. In a nail-driving machine having a barrel and provided with a power-percussed nail-driver movable along the axis of said barrel, a nose-piece slidably fitted in said barrel and having a longitudinal through bore through which said driver extends, resilient means retracting said nose-piece into the barrel, an enlarged flange on the end of the nose-piece and cooperating with the adjacent end of the barrel to limit the retraction of the nose-piece into the barrel, and cooperative portions on the driver and nose-piece and engageable during percussive movement of the driver to impart the power-percussed force of the driver to the nose-piece to project the latter against the force of the retracting means.

5. In a nail-driving machine according to claim 4: said barrel having oppositely disposed longitudinal slideways, and said resilient retracting means including retainer elements in said slideway and slidably connected with the nose-piece.

6. A nail-driving machine comprising, in combination, a barrel having a through longitudinal bore, a nose-piece slidably fitted in the bore and

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having a through bore, means resiliently retaining the nose-piece retracted within the barrel bore, and a power-percussed nail-driver having a shank extending through the bore in the nose-piece and provided with an abutment to engage said nose-piece to move the latter in the direction to project a portion of the same from the barrel bore.

7. A nail-driving machine according to claim 1: a flange on an end of the nose-piece and held in engagement with the adjacent end of the barrel to limit the retracted position of said nose-piece in the barrel bore.

8. A nail-driving machine comprising, in combination, a barrel having a through longitudinal bore, a nose-piece slidably fitted in the bore and having a through bore, means resiliently retaining the nose-piece retracted within the barrel bore, a power percussed nail-driver having a shank extending through the bore in the nose-piece, and interengaging abutments, one on the nose-piece and the other on the nail-driver, to impart to the former the percussive force and movement of the latter.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,213,970	Sturtevant	Jan. 30, 1917
2,543,942	Shaff	Mar. 6, 1951
2,573,540	Cavanaugh	Oct. 30, 1951