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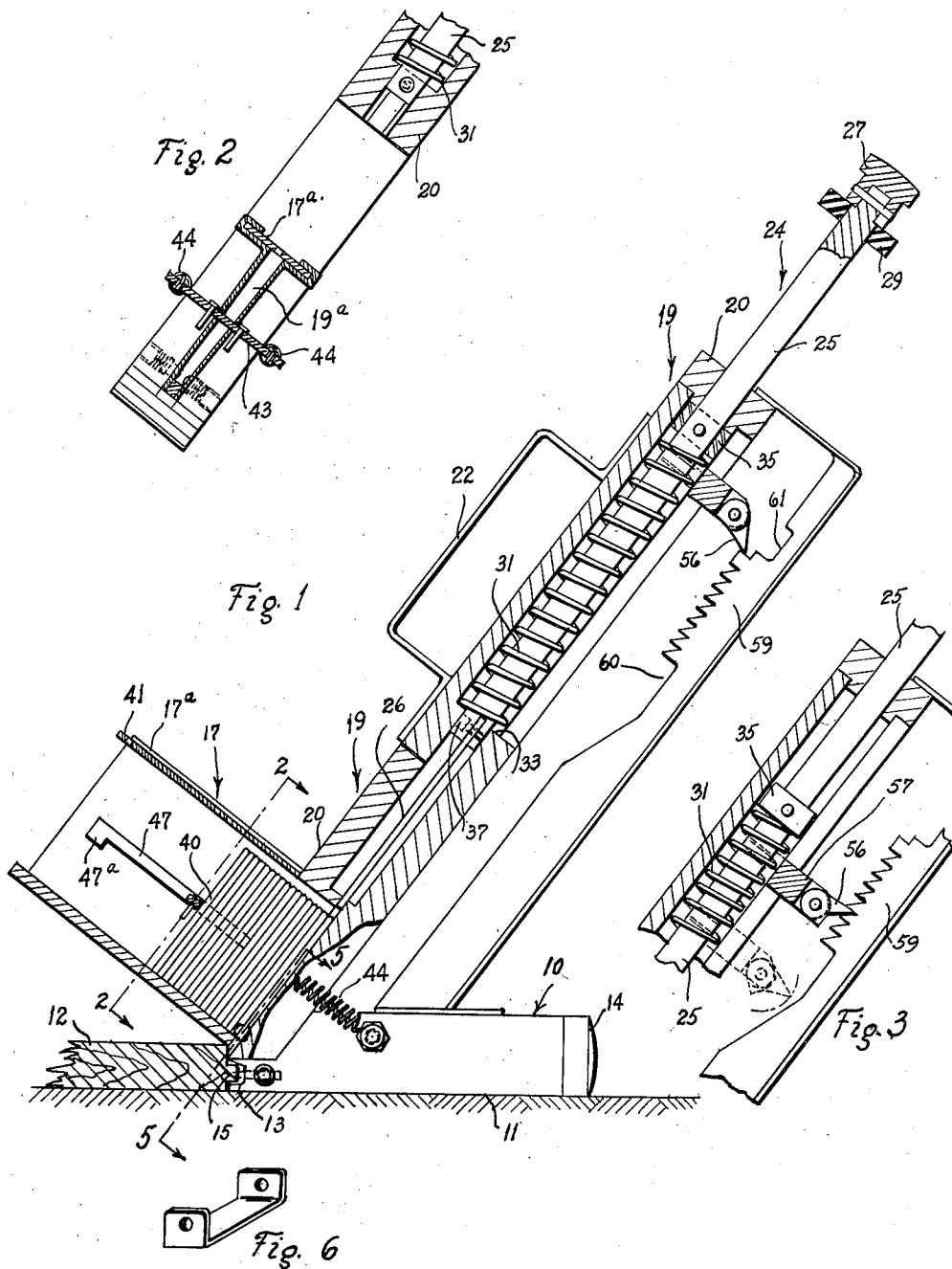
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FULL THROW MECHANISM FOR FASTENER DRIVING MEANS

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2 Sheets-Sheet 1



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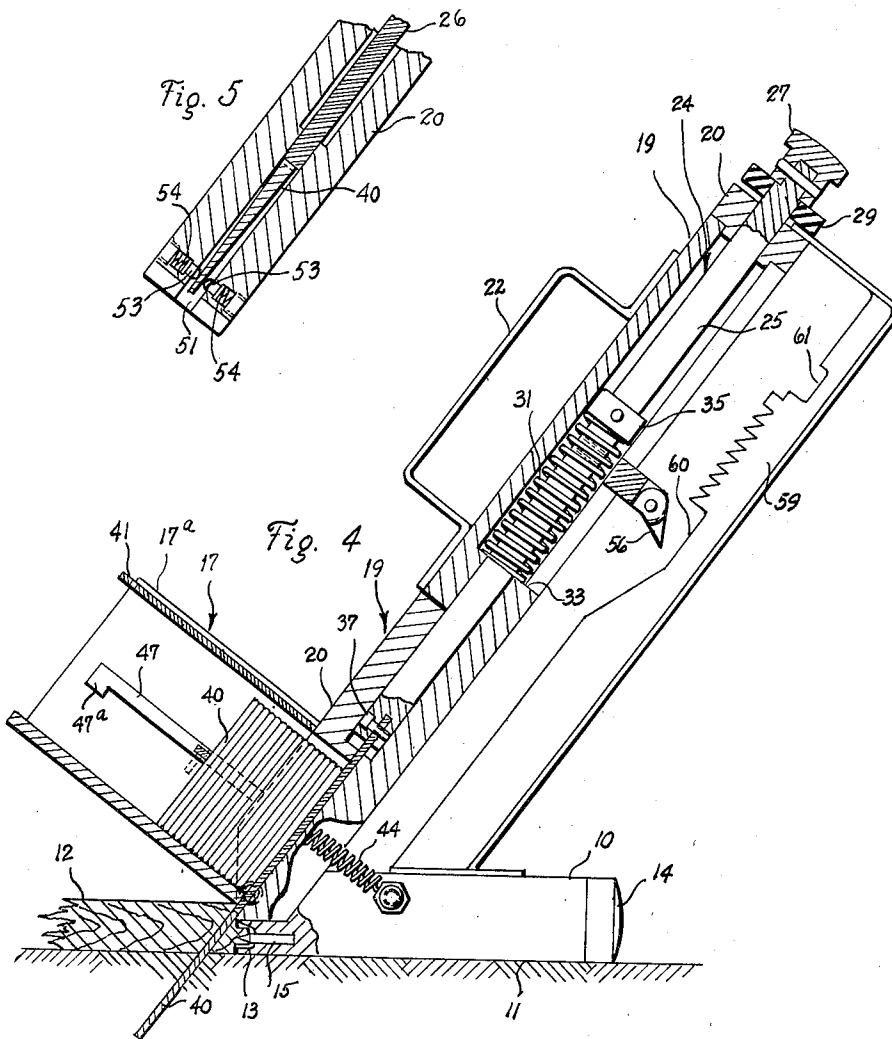
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FULL THROW MECHANISM FOR FASTENER DRIVING MEANS

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1 Claim. (Cl. 1—46)

This invention relates to nailing machines, and more particularly to such machines for blind nailing, as done in laying floors, and especially for finishing floors of the usual matchboard type.

It is known that floor laying is a specialty in carpentry, requiring high priced labor, in that the necessary skill and speed are not possessed by the general carpenter. It is also known that the required skill is in the nailing operation, which is to be done without marring the flooring and without the oft-occurring injury to the hands of the floor layers. The present machine eliminates the necessity for skilled floor layers, and may be used, by anyone who can swing a hammer, to lay flooring rapidly and skillfully.

Another important advance in the art made by this machine is that it enables the use of a cheaper nail than the usual relatively hard and expensive cut nail now required in the nailing of hardwood floors. With the machine of the present invention, cut nails may be made from the relatively soft drawn wire from which the usual wire nails are made, and driven, without bending, into hardwood floors, it being well known in the art that so-called cut nails should be used in finishing floors, as wire nails give a squeaky floor. Previous nailing machines required that cut nails made from drawn wire, and used in hardwood floors, be hardened before use, which added to the cost of the nails. One prior nailing machine requires the use of twisted and hardened wire nails, which nevertheless produce squeaky floors, and moreover split hard flooring due to being pointed, it being known that pointed nails spread the fibers, whereas cut nails cut the fibers thru which they are driven.

Another advantage of the present machine is that it is provided with a base or foot which, without marring the floor boards, may be tapped with a hammer, to match or tighten the board being laid to the previously laid board, and holds in position the board about to be nailed. As later to be explained, this base or foot is readily adjustable to flooring of different thicknesses, and also both to standard and to center match flooring.

A still further advantage of my present invention lies in its greater simplicity, whereby its cost is about one third that of comparable nailing machines now produced.

Other advantages will be apparent to those skilled in the art from a reading of the following description, taken in connection with the accompanying illustrative drawing, in which,

Figure 1 is a side elevation, partly in section, of one embodiment of the invention, certain parts being in the position existing before a nail is driven into a finishing floor board, shown;

Figure 2 is a section taken on line 2—2 of Fig. 1 and adjoining parts;

Fig. 3 is a fragmentary section of Fig. 1 showing the position of the driver, a retracting spring around the latter, and a pawl which moves with the driver, and engages a rack to prevent retraction of the driver until a nail is fully driven;

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Fig. 4 is a view similar to that of Fig. 1, but shows the position of parts when a nail has been completely driven;

Fig. 5 is a section taken on line 5—5 of Fig. 1 and shows a nail in position to be driven; and

Fig. 6 is a perspective view of a type of shim used to slightly elevate the forward end of the device to properly position it for flooring of different thickness and tongue position.

Referring to the drawings for a more detailed description, the machine comprises a base or foot 10 which rests for example on a subflooring 11. The forward end of the base is placed in contact with a board to be nailed, and preferably against the tongued side of the usual matchboard flooring, as for example the board 12. The mentioned forward end of the foot has a groove 13 formed transversely therein to receive a board tongue, and contacts the side of the board above and below the tongue. In laying flooring, each board should fit tight against the adjacent board, and to assure this, the board being laid is tapped with a hammer against the previously laid board, which operation, when done by hand, injures the tongue and often the upper edge of the board and thereby often mars its appearance. In laying flooring with the present machine, no damage is done to the flooring, due to the fact that the impact is exerted over a comparatively large area, the forward end of the base fitting flush against the side of the board above and below the tongue thereof, while the said groove 13 receives the tongue. The groove may, if desired, be deeper than the width of the tongue so that when the rear end 14 of the base is tapped with a hammer, no pressure is exerted on the tongue and the latter is therefore not dented at all. To adjust the base to flooring of different thicknesses and tongue position, a shim of suitable thickness, and of the type shown in Fig. 6, is placed under the forward end of the base. For the purpose of holding the machine in fixed position for the nailing operation, but more particularly for an inexperienced nailer using it, a pair of pointed pins or spikes 15 are removably secured in the base and extend horizontally and forwardly into the mentioned groove. These pins are forced into the board tongue when the rear end 14 of the base is tapped to fit it to the previous board, the machine thereby being held fixed. However, after a little experience with the machine, said pins may be removed.

The main operational part of the machine comprises a magazine 17 for holding nails and feeding them singly into the lower part of the hollow body 19. The latter comprises a casing 20 which is mainly in the form of an elongate square prism attached to the base 10 and rising rearwardly from the forward end portion thereof at an angle of about 45 degrees, or the angle at which nails are to be driven into the flooring. A handle 22 is secured to the upper side of the casing 20 for convenience in carrying the machine. A driving rod or driver 24 for driving the nails is reciprocatingly mounted in the mentioned casing. Said driver comprises a stout upper portion 25 and a lower reduced portion 26 of smaller cross sectional area. The upper portion extends beyond the upper end of the casing 20 and has a head 27 which is struck by a hammer in driving nails. A resilient bumper 29, as of rubber, surrounds the part 25 just under the head 27 and takes the shock of the hammer blows when it comes into contact with the upper end of the casing 20, as shown in Fig. 4.

To retract the driver after a nail has been driven home, a helical spring 31 is provided. This spring surrounds the upper part 25 of the driver and is compressed when the driver is hammered, as its lower end abuts against a shoulder 33, formed inside the casing, and its upper end presses against a collar 35 fixed on the driven portion.

25. The reduced cross sectional size of the lower portion 26 of the driver is such as to correspond approximately to that of the nails to be driven, and is shown as detachably connected to the upper part 25 by a threaded bolt 37. It will be seen that the part 26 is in line with the bottom nail lying in the magazine 17, i. e., in a position to drive such nail.

It is seen that the magazine 17, which has a slide cover 17a, is at right angles to the body 19 of the machine, so that the nails 40 are parallel with the mentioned body. The nails herein illustrated are of the cut type and substantially wholly wedge shape, in which the heads are not larger than the adjoining part. In filling the magazine, the heads of the nails are of course placed towards the driver, i. e., at the upper side 41 of the magazine, the first few nails being placed in by hand and the others all at once from a carton of nails, using a grip or spring clamp to transfer them from the carton to the magazine. The inside width of the magazine, or nail chamber 19a, is the width of a nail, as clearly shown in Fig. 2, so that it receives only a single stack of nails, and these are kept under side pressure to insure the proper consecutive feeding of single nails into position to be driven. The means for exerting such side pressure comprises a pusher 43 pressed crosswise against the topmost nail, and about midway thereof, by a pair of helical springs 44 in tension, as clearly shown in Fig. 2. Said springs are secured to the sides of the base 10 at their lower ends and to said keeper at their upper ends. The pusher is disposed crosswise of the side walls of the magazine through opposite slots 47 formed in said walls and extends substantially from the top to the bottom thereof. In order to release the pressure of the pusher, as when refilling the magazine, it is pulled back against the tension of the mentioned springs and its ends dropped into a pair of opposed notches 47a, formed at the upper ends of the slots 47. To prevent nails from dropping out of the magazine and then out of the machine thru the outlet orifice 51 (see Fig. 5), unless driven into a board by the driver, a pair of opposed, resiliently mounted, detents 53 are positioned in the body 19, near the lower end of the latter, and extend into the outlet orifice 51. Said detents are mounted on helical springs 54, shown in Figs. 2 and 5, and thus yield to the pressure of a nail being driven but keep nails from falling out at other times.

Inasmuch as a nail is seldom driven with one hammer blow, and since the driver would otherwise be self-retractive between hammer blows, a valuable feature of the invention is the provision of means for preventing such retraction in order to keep the driver in contact with the nail until the latter is driven home, whereupon said means allows the automatic retraction of the driver to

the position for driving the next nail. Such means comprises a pawl 56 pivotally mounted to swing freely forward and backward on a bracket 57 which is secured to the upper part 25 of the driver and extends at right angles thereto. If a nail is driven only part way by a hammer blow, the pawl engages a rack 59 and holds the driver in the position to which it is driven, as shown in Fig. 3, i. e., its lower end remains in contact with the nail. When the nail is fully driven, the pawl, as shown in Fig. 4, drops to the vertical position shown in the latter figure, the rack being cut away at 60 to allow this, whereupon, the driver being retracted by the coiled spring 31, the pawl rides over the teeth of the rack, back to the position of Fig. 1. The rack at its upper end portion is also cut away at 61 to allow the pawl to reverse its direction. It will be seen that the rack is parallel to the driver and in spaced relation to the body of the machine, being secured to the upper end of the latter and to the foot 10.

What is claimed is:

In a nailing machine having a base, and a driving rod inclined at an acute angle thereto in a vertical plane and reciprocable within a casing, and a spring adapted to pull the driving rod back to its uppermost position, means for holding said rod adjacent the head of a partly driven nail and for automatically allowing retraction of the rod after a nail is fully driven, said means comprising a rack bar parallel with and spaced from the casing below the latter, a pivoted pawl carried by the driving rod and depending therefrom and free to swing, said rack bar being cut away, at both ends thereof, below the teeth thereof to allow the pawl to swing from one position to another as the driving rod changes its direction of motion, said pawl being disposed to move freely over and in contact with teeth of the rack bar when the driving rod moves in driving a nail, and to drop between the teeth of the rack bar and hold the driving rod when the latter comes to rest before a nail is fully driven, and to ride back on the teeth of the rack bar after a nail has been fully driven, when said spring returns the rod to its upper position.

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