

April 12, 1966

W. F. LYGO

3,245,596

NAILERS WITH NAIL SPOTTER

Filed June 15, 1964

2 Sheets-Sheet 1

Fig. 1

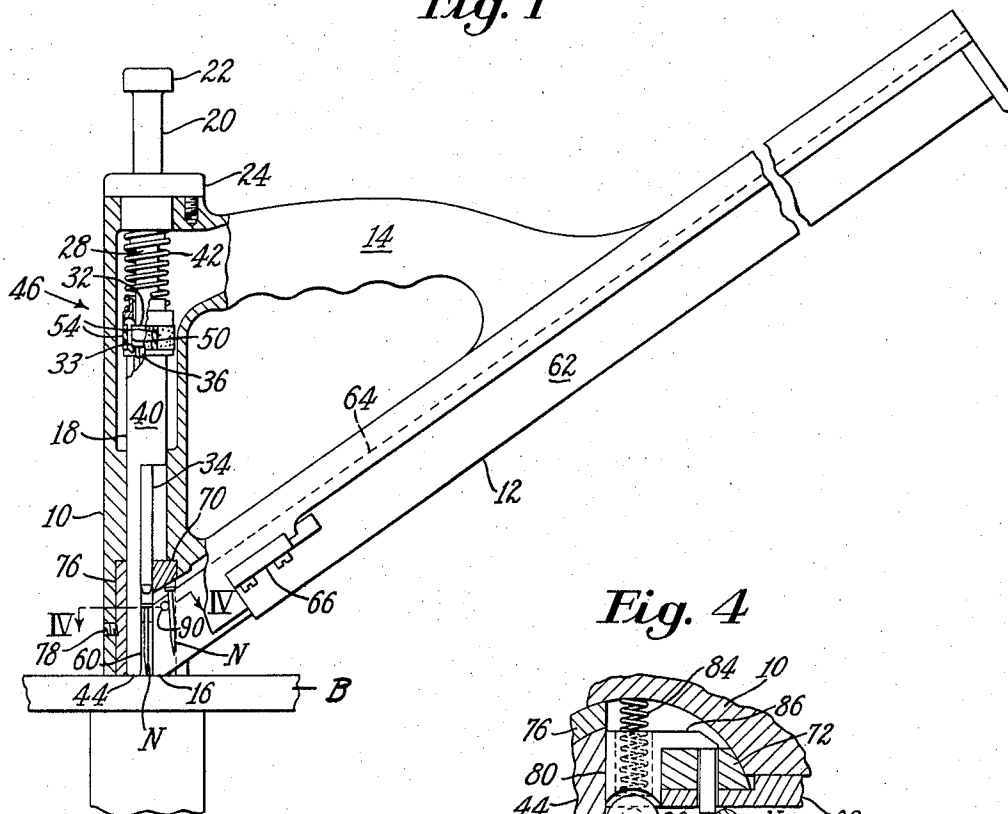
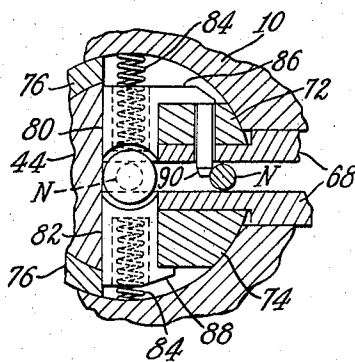


Fig. 4



Inventor

Walter F. Lygo
By his Attorney

Walter F. Lygo

April 12, 1966

W. F. LYGO
NAILERS WITH NAIL SPOTTER

3,245,596

Filed June 15, 1964

2 Sheets-Sheet 2

Fig. 2

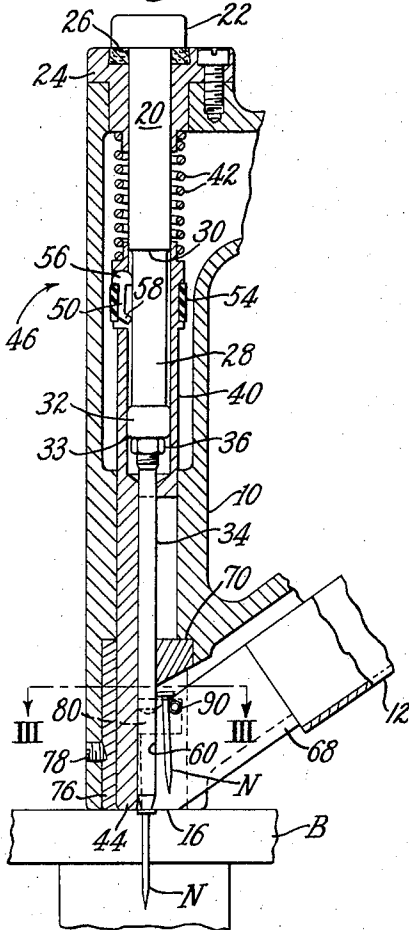


Fig. 6

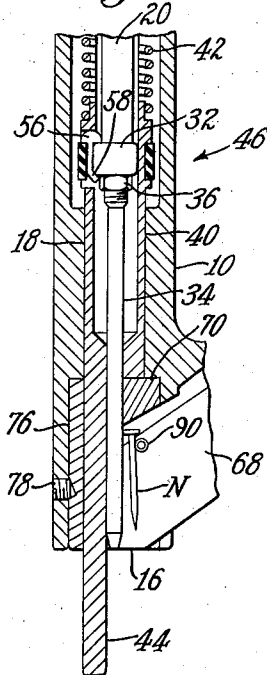


Fig. 5

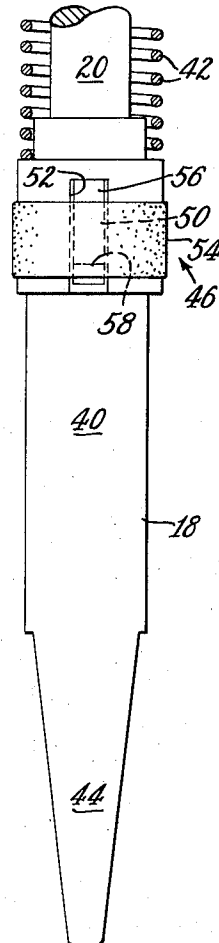
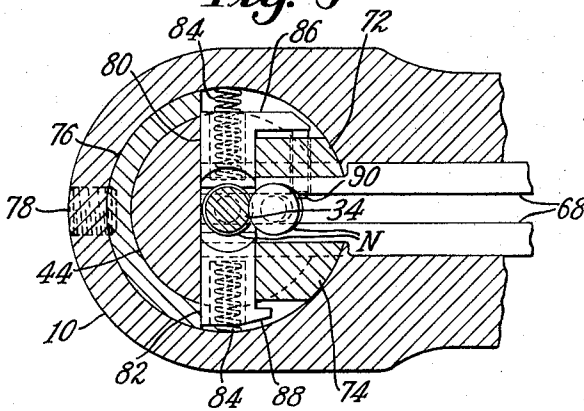


Fig. 3



1

3,245,596

NAILERS WITH NAIL SPOTTER

Walter F. Lygo, Leicester, England, assignor to United Shoe Machinery Corporation, Flemington, N.J., a corporation of New Jersey

Filed June 15, 1964, Ser. No. 374,943

Claims priority, application Great Britain, Nov. 15, 1963, 45,116/63

6 Claims. (Cl. 227-116)

This invention relates to a manually operable fastener inserting device, and more particularly to an easily manipulated and economical tool adapted for use in nailing subflooring or the like. It will be understood that the invention is not limited to the particular embodiment herein shown.

When fasteners are to be successively driven manually it is most helpful if they can be continuously supplied in a portable tool and automatically delivered one after another into position to be engaged by a driver. One relatively economical tool of this general type for laying tongue and groove flooring is disclosed, for example, in Patent 3,012,247 issued December 12, 1961 in the name of Frederick S. Sillars et al. With this tool nails may be driven through the edge of a floor board at an acute angle with its upper surface. Carpenters are, of course, often confronted with many situations wherein successive nails need not be driven at an acute angle into the work, as for instance in securing subflooring, and the matter of correctly spotting or locating each fastener accurately and easily remains important.

In view of the foregoing it is a primary object of this invention to provide an improved, yet simple, manually operable fastener driving tool by which successive fasteners such as headed nails may be conveniently driven vertically into a workpiece.

Another object of this invention is to provide a rugged but uncomplicated nailer which, upon being presented to a horizontal workpiece to be nailed, will automatically reposition a driver for driving and the next nail to be driven thereby.

Yet another object of this invention is to provide an economical nailer having means for locating the nail to be driven by a driver and for cocking the latter.

In pursuance of these objects and as a feature of this invention there is provided, in a hand-held fastener inserting device having a driver and a raceway for feeding successive fasteners thereto to be driven, a driver retracting member yieldingly retractable into the device in response to its presentation to and engagement with the fastener receiving surface of a workpiece, and means releasably connecting the driver and the member whereby retraction of the latter restores the driver to its initial driving position in relation to the delivery end of the raceway and releases a fastener therefrom in readiness to be driven by the driver.

The above and other features of the invention, together with novel details of construction, will now be more particularly described in connection with an illustrative embodiment, and with reference to the accompanying drawings, in which:

FIG. 1 is a view in side elevation of a hand-held nailer, portions being broken away to reveal internal construction, the nailer being in its "cocked" position;

FIG. 2 is an enlarged sectional view of the body portion shown in FIG. 1, the parts now being shown in their relative positions after the driving of a nail;

FIG. 3 is an enlarged section taken on the line III-III of FIG. 2;

FIG. 4 is a section taken on the line IV-IV of FIG. 1;

FIG. 5 is a front view of a portion of a driver-retracting

2

and fastener-locating member shown in FIG. 2 and its associated latching mechanism; and

FIG. 6 is a view corresponding to the lower portion of FIG. 2, but showing the driver-retracting member extended and latched to the driver.

The illustrative nailer comprises a hollow body portion 10, a magazine 12 for fasteners, and an interconnecting handle portion 14 by which the tool is normally manipulated into and out of successive work areas. An operator may seize the portion 14 to hold the body portion 10 in a generally vertical operating position wherein a lower end face 16 of the portion 10 is engageable with a workpiece such as a board B to be nailed. For conveniently spotting thereon the exact location of a nail N to be driven, the nailer includes a retractable fastener-locating member 18 which is also operative to cock a composite driver 20 and for other purposes as herein-after explained.

The member 18 and the driver 20 are mounted side-by-side for axial movement in the body portion 10, the lower or work-engaging end of the member 18 being projectable outwardly from the face 16 at a point preferably in the general common plane containing the magazine 12, the driver 20, and the handle portion 14. A reason for this arrangement is to facilitate location of the tool on the board B to insure that each nail will be set exactly where intended. Thus the member 18, which projects from the tool as shown in FIG. 6 when it is inoperative, may be directed by one hand on the portion 14 to a point adjacent to the desired nail receiving locality of the board. The member is retracted into the tool as the face 16 is brought into engagement with the board for purposes hereinafter to be described. When the other hand of a user thereafter directs blows to an upper end or head 22 of the driver, to shift it from the position indicated in FIG. 1 to that shown in FIG. 2, he may be assured that a nail will be directed and driven into the selected locality.

For slidably mounting the driver 20, a cap 24 is secured to the upper end of the body portion 10 and has recessed therein a resilient washer 26 (FIG. 2) engageable with the driver head 22 when the latter reaches the end of its inserting movement. The driver comprises an intermediate, reduced shank portion 28 (FIG. 2) the upper portion of which is bounded by a lip 30 (FIG. 2) and the lower portion of which terminates in an internally threaded flange 32 for axially receiving the threaded upper end of a driver bar 34 (FIGS. 1, 2 and 3). The latter is secured in assembled relation by a lock nut 36.

An upper portion 40 of the locating member 18 is cylindrical and hollow coaxially receiving the driver 20. A compression spring 42, acting between flanges formed respectively on the cap 24 and the portion 40, normally urges a depending leg 44 of the member 18 axially out of the tool when the leg is not restrained by a workpiece. When the leg 44 is thus yieldably extended beyond the face 16 for spotting a fastener, releasable latch means generally designated 46 (FIGS. 1, 2, 5 and 6) about to be described, secures the driver 20 against relative axial movement with respect to the driver retracting or cocking member 18. Thus the driver is returned to its raised or "cocked" operating position shown in FIG. 1 by bringing the face 16 to bear on the workpiece, the member 18 being forcibly retracted and remaining connected to the driver by the releasable latch means 46. In connected relationship (FIGS. 1 and 6) the latch means 46 has a latch 50 yieldably retained in a circumferential slot 52 (FIG. 5) of the portion 40 by an elastic member, for instance a rubber-like band 54. The latter is, as indicated in FIGS. 2 and 5, largely seated in a peripheral recess formed in the portion 40, and is received

between an upper, rounded portion 56 (FIG. 2) of the latch and a lower inclined cam end 58. The latter is disposed for cooperation with a lower camming edge 33 of the flange 32. The axial spacing of these latch portions 56, 58 is such as to accommodate and releasably engage and hold the flange portion 32 of the driver in order to hold, as shown in FIG. 1, the drive in the cocked position. Subsequently, by a blow or blows on the head 22 a nail N immediately beneath the latched driver is to be driven endwise through an exit passageway 60 formed in the portion 10.

Movement of the driver retracting member 18 from its extended to retracted position is effective as will next be explained to allow the endmost nail N in the magazine 14 to be positioned beneath the raised driver bar 34. To this end the magazine detachably includes an inclined, U-shaped raceway 62 (FIGS. 1 and 2) which may be adapted to feed prepackaged nail strips or, as shown, nails individually slidable in single file while supported by their heads. Opposed side walls 64 of the raceway on which the nail heads slide are resiliently held in position by a pair of cooperating clamping blocks 66, one only shown in FIG. 1. An extension of the nail passageway for guiding successive nails from the raceway, pointed ends down, and into the exit passageway 60 is provided by parallel plates 68 secured by the blocks 66. Referring to FIGS. 1, 3 and 4, a block 70 (FIG. 1) having arms 72, 74 (FIGS. 3 and 4), one on each side of the raceway, is secured within an enlarged bore of the portion 10 by means of a sleeve 76 which is itself held therein in fixed position by a setscrew 78. The block 70 is vertically bored to receive and guide the bar 34. For supporting by its head, and in the path of the driver, the next nail N to be driven, the arms 72, 74 are respectively slotted to carry conically recessed jaws 80, 82. These jaws are accordingly spring-pressed toward one another, a spring 84 in each jaw bearing internally on the body portion 10. In order to keep the jaws sufficiently apart to receive successive shanks of the nails released from the magazine 14, lugs 86, 88 of the jaws 80, 82 respectively engage outer sides of the arms 72, 74. When the driver bar 34 is urged upwardly within the tool by retractive movement of the member 18 and passes above the jaws, their springs 84 urge them into the driver path and cause a detent pin 90 secured to the lug 86 of the jaw 80 to obstruct the passageway for the nails N, except for an endmost one which is allowed to descend by gravity into the driver path to be supported in the conical pocket formed by the cooperating jaws.

As will be understood from the foregoing, with the tool operatively positioned as shown in FIG. 1, and having a nail to be driven positioned in the jaws, an operator strikes the head 22 with a hammer. As a result the lower beveled edge 33 of the flange 32 which then is in engagement with the inclined cam portion 58, forces it and the latch 50 outwardly against resistance of the band 54 thus disengaging the flange 32 to free the driver from the driver retracting member 18. Driving movement of the driver is imparted to the nail in the passageway 60 thereby separating the jaws and withdrawing the pin 90 from the raceway. As the nail is driven into the board B as shown in FIG. 2, the next nail to be driven assumes a position adjacent to the driver bar 34. After driving of the nail beneath the driver bar, withdrawal of the device from the work allows the spring 42 to project the leg 44 outwardly preparatory to spotting the next nail to be driven. The latch 50 at this time re-establishes its connection with the driver flange 32 by receiving the latter between the portions 56, 58 and then being ready to lift or cock the driver with respect to the body portion 10 when next the leg 44 is pressed against the workpiece. The operating cycle may then be repeated.

Having thus described by invention, what I claim as

new and desire to secure by Letter Patent of the United States is:

1. In a fastener inserting device of the type having a driver and a raceway for feeding successive fasteners thereto to be driven by the driver into a workpiece, a projectable driver retracting member yieldingly retractable from an extended position into the device in response to its pressural engagement with a fastener receiving surface of the workpiece, and means for releasably connecting the driver and the member, the connecting means being rendered inoperative by initial driving movement of the driver and rendered operative by projection of the member upon withdrawal of the device from the workpiece.

2. A device as set forth in claim 1 having detent means associated with the raceway for releasing successive endmost fasteners therefrom into the operating path of the driver, the detent means being actuatable by a driving stroke of the driver.

3. A device as set forth in claim 1 and further characterized in that the releasable means for connecting the driver and the locating member comprises a latch for securing the driver and the member for joint axial retractive movement, the latch being arranged to be shifted out of latching relation in response to axial driving force exerted on the driver, and elastic means for causing the latch effectively to connect the driver and the member when the latter has been moved to its extended position.

4. In a hand-held fastener inserting device having a driver and a raceway for feeding successive fasteners thereto to be driven, a fastener-locating and driver retracting member yieldably retractable into the device from an extended fastener locating position in response to its presentation to and engagement with the fastener receiving surface of a workpiece, and means releasably connecting the driver and the member whereby retraction of the latter restores the driver to initial driving position in relation to the delivery end of the raceway and releases a fastener therefrom in readiness to be driven by the driver.

5. In a manually operable nailer having a hollow body and a raceway for supplying successive nails to the body, a driver mounted in the body for axial driving movement in a path adjacent to the delivery end of the raceway, a detent in the raceway to retain the successive nails therein, jaw means carrying the detent and for supporting in the driver path a nail to be driven, a spring-pressed nail locating member mounted in the body for movement parallel to the driver, and means releasably latching the member to the driver when the latter is in initial position for driving, said latch means comprising a latch carried by the member and arranged, when the member is projected from the tool, releasably to engage a cooperative portion of the driver whereby, when the body is presented in operative position to a workpiece, the projecting member is retracted to restore the driver to its initial position and the detent is actuated to release a nail from the raceway.

6. In a hand-held nailer having a tubular body provided with a work-engaging face, a driver mounted therein for axial movement to drive a nail through a bore formed in the face, said driver having a striking head and cam portions formed thereon, a nail spotting member arranged in the body for movement adjacent to the driver, a spring mounted in the body for urging a tapered work-engaging end of the member through said bore, and means mounted on the member for releasably engaging the cam portion of the driver, the arrangement being such that forcible retraction of the member into the bore restores said striking head to its initial driving position, and a driving blow on said head disengages the cam portion from said releasable engaging means.

No references cited.

GRANVILLE Y. CUSTER, JR., *Primary Examiner*.