March 10, 1953 LE ROY H. ALFORD 2,630,567

DEVICE FOR FEEDING NAILS IN POSITION FOR MANUAL DRIVING

Filed July 20, 1948 4 Sheets-Sheet 1

FIG. 1.

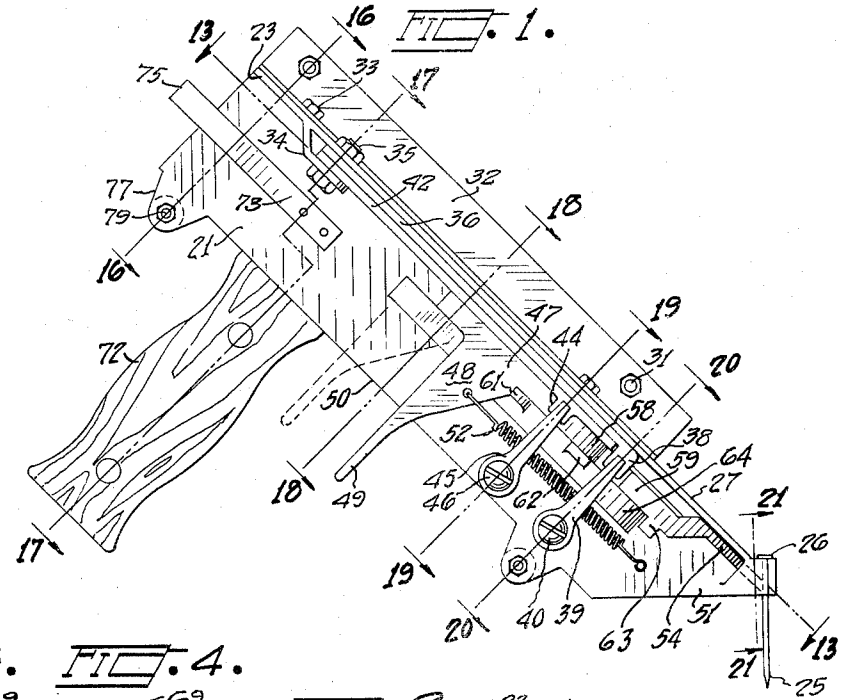


FIG. 3.

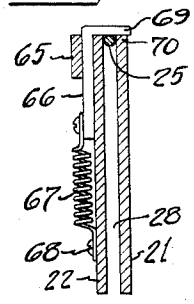


FIG. 4.

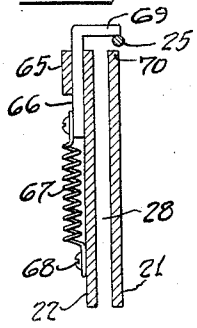


FIG. 2.

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DEVICE FOR FEEDING NAILS IN POSITION FOR MANUAL DRIVING

Filed July 20, 1948 4 Sheets-Sheet 2

FIG. 5.

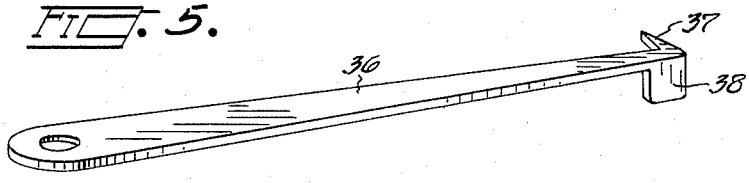


FIG. 6.

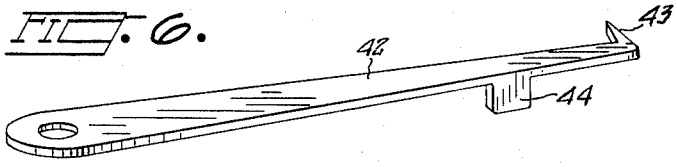


FIG. 8.

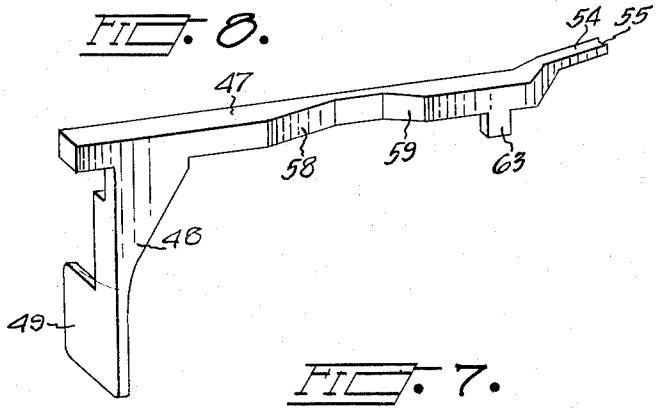


FIG. 9.

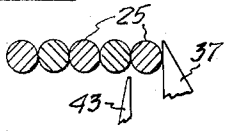


FIG. 10.

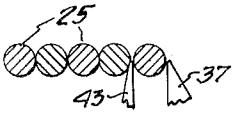


FIG. 11.

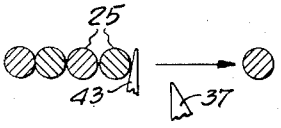


FIG. 12.

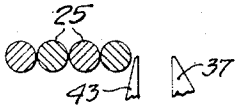
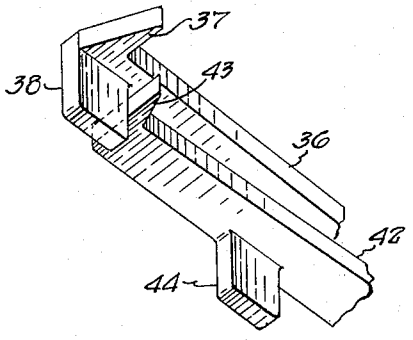


FIG. 7.



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March 10, 1953 LE ROY H. ALFORD 2,630,567

DEVICE FOR FEEDING NAILS IN POSITION FOR MANUAL DRIVING

Filed July 20, 1948 4 Sheets-Sheet 3

FIG. 13.

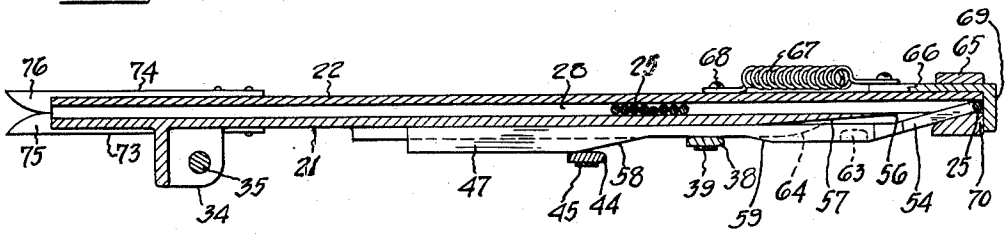


FIG. 14.

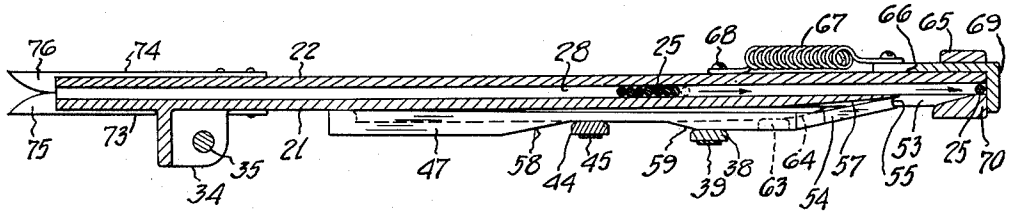
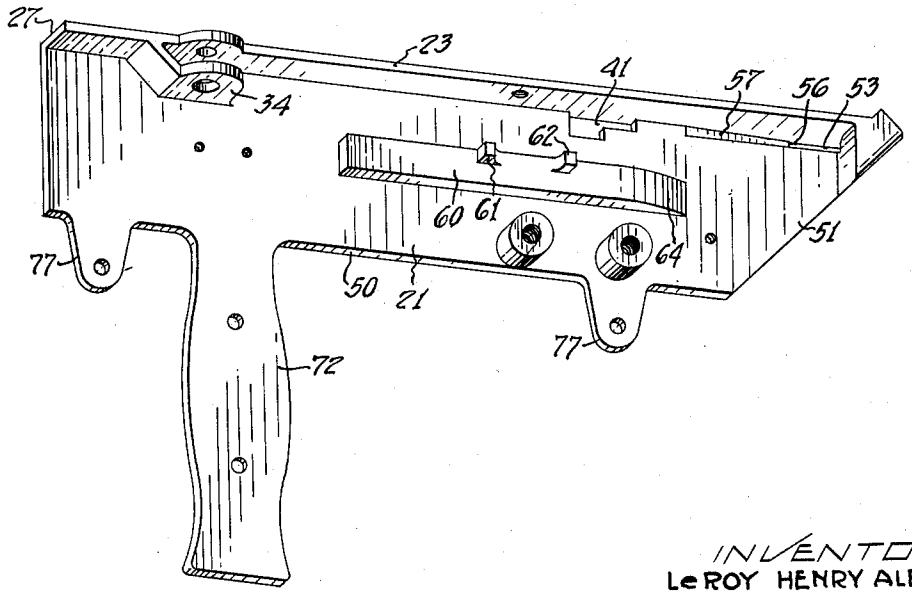


FIG. 15.



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DEVICE FOR FEEDING NAILS IN POSITION FOR MANUAL DRIVING

Filed July 20, 1948 4 Sheets-Sheet 4

FIG. 16.

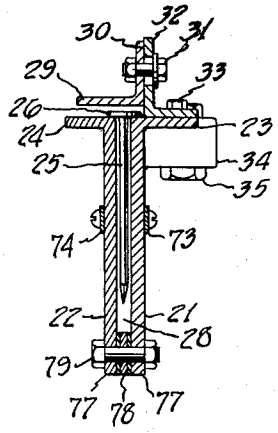


FIG. 17.

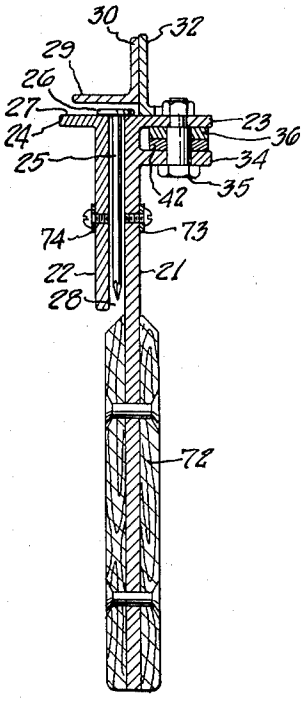


FIG. 18.

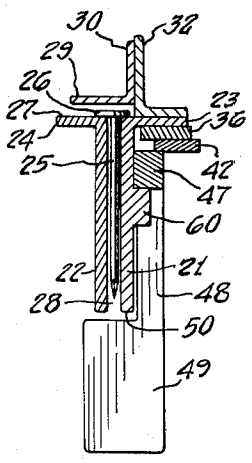


FIG. 19.

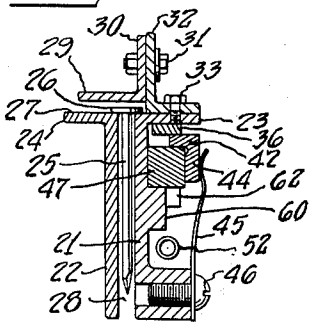


FIG. 20.

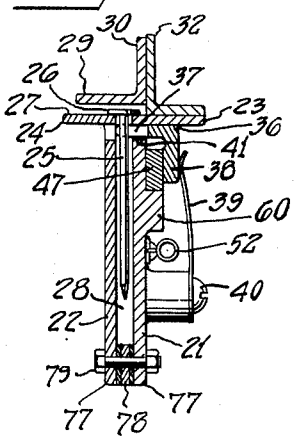
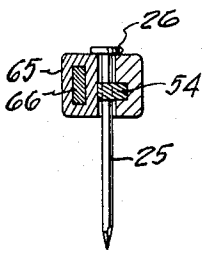


FIG. 21.



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Patented Mar. 10, 1953

2,630,567

UNITED STATES PATENT OFFICE

2,630,567

DEVICE FOR FEEDING NAILS IN POSITION FOR MANUAL DRIVING

Le Roy Henry Alford, Coquille, Oreg.

Application July 20, 1948, Serial No. 39,623

3 Claims. (Cl. 1—49.8)

1

This invention relates generally to nail driving equipment and particularly to a gun for holding nails in position for manual driving.

The main object of this invention is to facilitate the driving of nails in box making or other lines of activity where many nails must be driven in succession.

I accomplish this and other objects in the manner set forth in the following specification as illustrated by the accompanying drawings, in which:

Fig. 1 is a side elevation of the device in an operating position. The trigger has been moved to dotted position permitting the nail to slide by gravity to the position shown, after which the trigger is returned to full-line position. At this time the device is ready to be placed upon the work to be nailed.

Fig. 2 is a perspective view of the device showing same in position upon the boards to be nailed. This view shows the side opposite that shown in Fig. 1 and also shows the position taken by the nail when the device is pushed downwardly to contact the work. The nail can now be struck with a hammer and driven part way into the work and the device is then released from the nail, after which the nail is driven down with the hammer. (See Figs. 3 and 4.)

Fig. 3 is a section taken along 3—3 in Fig. 2 showing the resilient stop or gate, also nail against same.

Fig. 4 is a section similar to Fig. 3 except that the device has been pulled toward the operator. The device has also been moved sidewise and a continuation of this movement will remove the device from the partly driven nail.

Fig. 5 is a perspective view of the upper nail-releasing arm.

Fig. 6 is a perspective view of the lower nail-releasing arm.

Fig. 7 is a perspective as viewed from below, illustrating the relative location of points on the releasing arms.

Fig. 8 is a perspective of the trigger or slide which actuates the nail releasing arms.

Fig. 9 is a diagram of nail feeding sequence. In this figure the parts are in the full line position of trigger as shown in Fig. 1.

Fig. 10 is a diagram of the nail feed sequence with the trigger pulled part way to dotted position in Fig. 1.

Fig. 11 is a diagram of the nail feed sequence, with the trigger pulled to the dotted position in Fig. 1, thus releasing one nail to slide to the end of the runway and against the resilient gate.

2

Fig. 12 is a diagram of the nail feed sequence showing the relation of the parts when the trigger has been partly returned to the full-line position of Fig. 1.

Fig. 13 is a section in plan view taken along the line 13—13 in Fig. 1. (See also Fig. 9.)

Fig. 14 is a section similar to Fig. 13 but showing the location of the parts when the trigger has moved to the dotted line position of Fig. 1. (See also Fig. 11.)

Fig. 15 is a perspective view of the main side plate of the device.

Fig. 16 is a secion taken along the line 16—16 in Fig. 1.

Fig. 17 is a section taken along the line 17—17 in Fig. 1.

Fig. 18 is a section taken along the line 18—18 in Fig. 1.

Fig. 19 is a section taken along the line 19—19 in Fig. 1.

Fig. 20 is a section taken along the line 20—20 in Fig. 1.

Fig. 21 is a section taken along the line 21—21 in Fig. 1.

Like numbers of reference refer to the same or similar parts throughout the several views.

Referring in detail to Fig. 2 of the drawings, there is shown a pair of spaced side plates 21 and 22, the former having an outturned flange 23 and the latter having an outturned flange 24. The plates 21 and 22 are spaced far enough apart to permit the free passage of nails 25 whose heads 26 ride on the surfaces 27 of the flanges 23 and 24.

Over the slot 28, formed between the plates 21 and 22 and spaced from the surfaces 27, is an angle bar 29 (Fig. 2), whose leg 30 (Fig. 16) is secured by the bolts 31 to the angle bracket 32 which is held by the bolts 33 to the flange 23. On the outer under side of the plate 21 (Fig. 15), is formed a bracket 34 which, together with the flange 23, supports a bolt 35 (Fig. 1), on which is hinged the upper nail releasing arm 36 (Fig. 5), having an inturned nail releasing finger 37 formed thereon, which is normally in the path of the nails 25 and prevents their advance along the nail guideway.

The arm 36 has also formed thereon a downturned lug 38 (Figs. 1 and 6), which engages the spring 39 which is held by the screw 40 and is inwardly urged thereby. The finger 37 projects through the opening 41 (Fig. 15), in the plate 21.

Also hinged on the bolt 35 is the lower nail separating arm 42 having the inturned nail separating finger 43 formed thereon and also the downturned lug 44 (Figs. 1 and 6), which nor-

mally engages the spring 45 which is held by the screw 46 mounted in the plate 21.

Below the lower nail separating arm 42 is disposed a slide 47 (Figs. 1, 8 and 13 and 14), on which is formed a trigger arm 48 whose finger engaging end 49 extends below the edge 50. The arm 48 is urged toward the muzzle end 51 of the gun by means of a spring 52 which is placed in tension between the members 43 and 21.

In the side of the plate 21, close to the muzzle end of the plate 21 is the slot 53 (Figs. 14 and 15), in which rides the inturned nail holding end 54 of the slide 47.

The nail-holding tip 55 of the end 54 is concavely formed to receive the body of the nail 25 just under its head 26, as shown in Figs. 8 and 13.

The plate 21 from a point near the opening 41 to the edge 56 is provided with an inclined surface 57, against which the inturned end 54 can ride when the trigger 49 is pulled backwardly (compare Figs. 13 and 4).

The slide 47 (Fig. 8) is provided with inclined surfaces 58 and 59, surface 58 engaging the downwardly turned lug 44 on the lower nail separating arm 42 when the trigger 49 is released, and the surface 59 engaging the downwardly turned lug 38 on the upper nail releasing arm 36 when the trigger 49 is pulled back.

Below the underside of the slide 47 (Figs. 1 and 15) is disposed an elongated guide 60 having the stops 61 and 62 formed thereon. Depending from the slide 47 is a lug 63 (Figs. 1 and 8), adapted to engage the inclined surface 64 formed on the end of the guide 60.

On the back of the plate 22 is disposed a guide 65 (Figs. 2 and 13), in which is mounted the slide 66 which is urged by the spring 67 toward the end of the slot 28. The spring 67 is attached to the plate 21 by means of a screw 68, or in any other convenient manner.

The slide 66 has a turned end 69 (Figs. 2, 3 and 4), which extends around the end 70 and serves as a gate to limit the lateral movement of a nail 25 until it is driven sufficiently into the wood 71 to permit its release by pulling backwardly on the hand grip 72 attached to the plate 21.

Secured at one end of the plates 21 and 22 (Figs. 2 and 13) are the spring pressed arms 73 and 74 whose ends 75 and 76 normally close the nail slot 28.

Depending from the edge 50 of the plates 21 and 22 are the ears 77 which are held in spaced relation by washers 78 (Fig. 16) and clamped together by the bolts 79. The purpose of this adjustment is to permit the handling of nails of different thickness.

The operation of the gun is as follows: Assuming that there are a number of nails 25 between the plates 21 and 22, it will be seen in Fig. 9 that with the trigger in rest position the first nail 25 is held against the releasing finger 37 (Figs. 9 and 20), the finger 37 being so urged by the spring 39. As the trigger 49 is moved toward the dotted position shown in Fig. 1, finger 37 on the upper release arm 36 is retracted from the front of the foremost nail while the finger 43 on the lower release arm 42 is advanced to the rear of the foremost nail, in a sequence of steps as seen in Figs. 9 and 11. The above action is caused by cams 59 and 58 acting on projections 38 and 44, which through leaf springs 39, 45 urge the upper and lower release arms inwardly toward the slot 28.

As the slide 47 is drawn backward from a position shown in Fig. 13, cam surface 59 contacts projection 38 to withdraw finger 37 from the position shown in Figs. 9 to 11. Concurrently with the rearward movement of the slide 47 cam surface 58 on the lower release arm is withdrawn from the lug 44 to permit the spring 45 to urge finger 43 to a position to the rear of the first nail and stop the second nail as shown in Fig. 11. With each retraction of the trigger 49, the slide 47 is retracted from the slot 53 (Fig. 14) to free the raceway 28 to permit the released nail to move by gravity against the inturned end of the gate as shown in Figs. 2 and 14. When the trigger 49 is released the end 55 re-enters the raceway 28 and engages the nail which is resting against the gate 69 and holds it there in any position in which the gun may be placed (see Fig. 13).

The nail is held with the head 26 projecting in an exposed position ready for driving as shown in Fig. 2. When it is struck into the wood enough to hold it, the gun is pulled against the partially driven nail which causes the gate 69 to open and to permit the gun to be released from the nail (compare Figs. 3 and 4).

It will be noted that reference is made to the end 54 riding on the inclined surface 57. The shifting action is brought about by the lug 63 when it engages the inclined surface 64 when the trigger is pulled. The surface 57 has a similar action, although its main purpose is to provide clearance for the emerging end 54.

I claim:

1. A nail gun for feeding nails for manual driving comprising a magazine with a raceway for nails, a trigger operated slide mounted along said magazine having a pair of cam surfaces thereon, a nail releasing finger hinged to said magazine and actuated by one of said cams, a nail separating finger also hinged to said magazine and actuated by the other cam, and a nail holder on the end of said magazine comprising a spring closed slide forming a closure for said raceway, and means for opening said closure to permit the removal of said gun from a partially driven nail.

2. A nail gun for feeding nails for manual driving, comprising a pair of spaced plates forming a raceway for nails, one of said plates having a handle projecting normally therefrom, a slide mounted on said plates along the outer top side thereof, said slide having a nail holding end capable of entering said raceway near the discharge end thereof, a spring closed slide on one of said plates having a turned end forming a closure for said raceway, an upper nail releasing arm hinged on one of said plates having a nail releasing finger on one end thereof capable of blocking said raceway, a cam on said slide for withdrawing said releasing finger from said raceway, a lower nail separating arm also hinged on one of said plates and having a nail separating finger for closing said raceway and spaced from said releasing finger by the diameter of the nails with which it is used upon withdrawal of said separating finger.

3. A nail gun for feeding nails for manual driving, comprising a pair of spaced elongated side plates constituting a raceway for nails, a bar supported by said plates spaced over said raceway, a gate at the discharge end of said raceway comprising a slide parallel with the raceway, said slide having a laterally turned end extending across the outlet of said raceway, said slide having a retracting spring for urging said turned end against the end of said raceway, an

upper nail releasing arm hinged to a side plate having a nail releasing finger thereon normally blocking the outlet of said raceway, a lower nail separating arm hinged to a plate having a nail separating finger on the end thereof normally out of said raceway, a trigger actuated slide on one of said plates having cam surfaces thereon whereby said releasing finger will be withdrawn as the trigger is pulled and said separating finger will be forced between the first and second nail and the end of said slide will hold the first nail in a nailing position against said gate.

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The following references are of record in the file of this patent:

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