J. F. PENNER AND A. A. LANSBERRY.

NAILING MACHINE.

APPLICATION FILED MAR. 25, 1921.

1,383,145. Patented June 28, 1921.

FIG. 3.

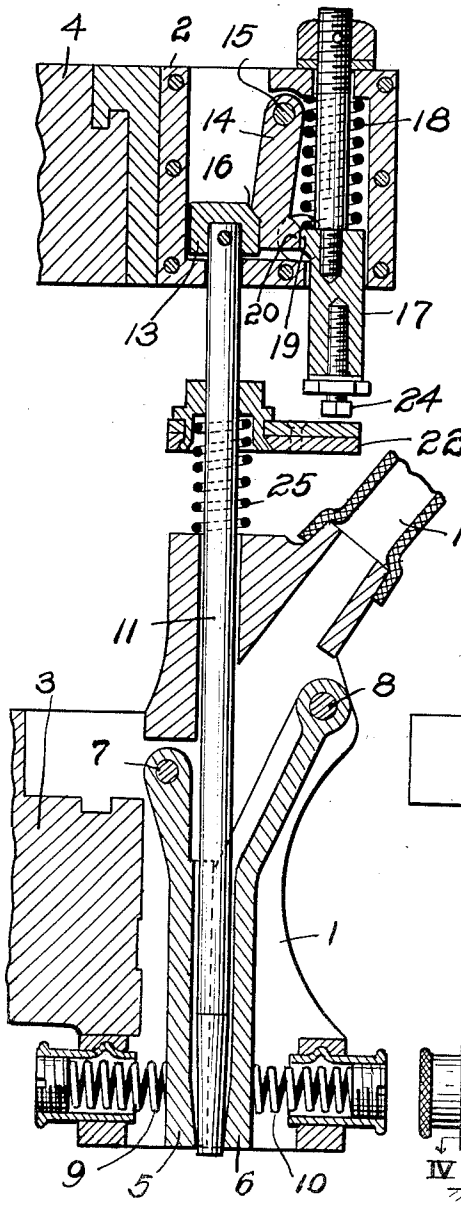


FIG. 1.

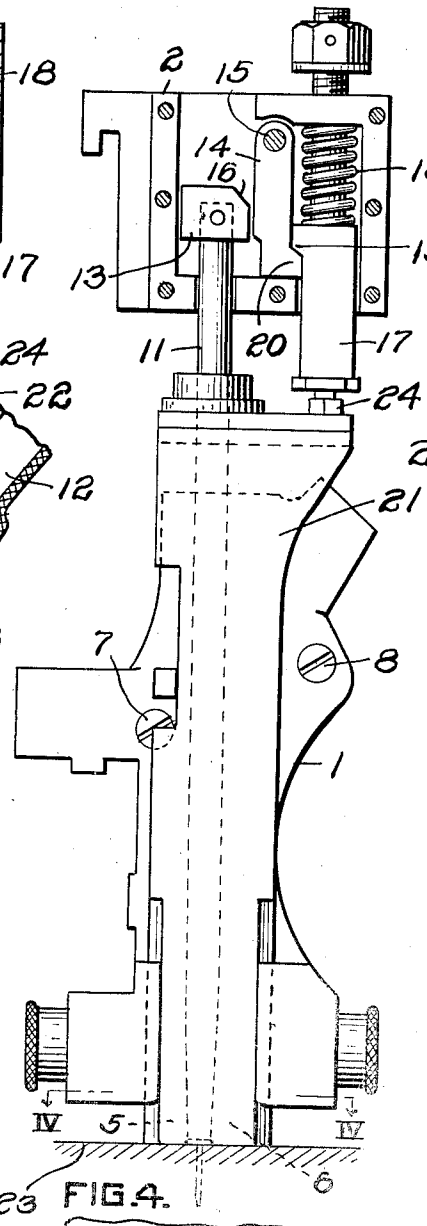


FIG. 2.

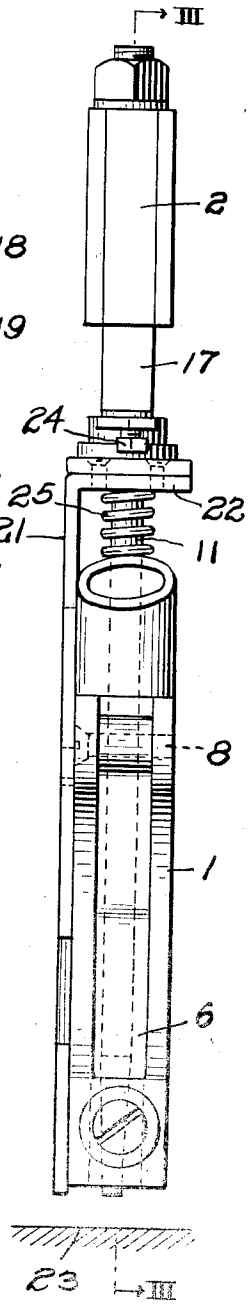
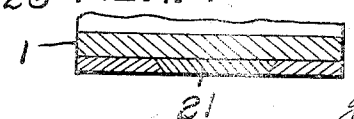


FIG. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH F. PENNER, OF NEW CASTLE, AND ALDA A. LANSBERRY, OF VANDERGRIFT, PENNSYLVANIA, ASSIGNORS TO VANDERGRIFT BOX COMPANY, A CORPORATION OF MICHIGAN.

NAILING-MACHINE.

1,383,145. Specification of Letters Patent. Patented June 28, 1921.

Application filed March 25, 1921. Serial No. 455,618.

To all whom it may concern:

Be it known that we, JOSEPH F. PENNER and ALDA A. LANSBERRY, citizens of the United States, and residents of New Castle and Vandergrift, in the counties of Lawrence and Westmoreland and State of Pennsylvania, have invented a new and useful Improvement in Nailing-Machines, of which the following is a specification.

The invention relates to nailing machines such as are now commonly used for various purposes, including the manufacture of packing boxes and the nailing of lids upon them after they have been packed. Each machine includes a head and a chuck holding member mounted on a suitable frame for reciprocation with relation to each other. The chuck holding member is usually provided with a plurality of nail-holding chucks and the heads with plungers, the chucks and plungers forming nail-driving elements, cooperating in pairs to drive a plurality of nails simultaneously.

In the use of these machines, it frequently happens that, because of the irregularity of the face of an article into which nails are driven, some nails are driven too far and others not far enough. This is objectionable at all times and in all uses of a machine, but is particularly objectionable when the nailing machine drives nails through metal straps with which the boxes are bound and reinforced. When the nails are driven too far into the straps the heads of the nails are broken off, or, more frequently, they are punched entirely through the straps with the result that the straps are not properly nailed to the boxes.

The object of the invention is to provide a nailing machine with nail-driving elements arranged in pairs, each pair of which will, during each cycle of operation of the machine, drive a nail to such extent as may be necessary, depending upon whatever elevation or depression there may be in the face of the article at the place where the nail is driven.

The invention is illustrated in the accompanying sheets of drawings of which Figure 1 is a side view of a pair of nail-driving elements with the parts in their positions at the completion of the driving operation; Fig. 2 a face view of the parts in position near the end of the driving stroke; Fig. 3 a sectional view taken on the line III—III Fig. 2; and Fig. 4 a detail partial sectional view taken on the line IV—IV Fig. 1.

In the drawings there is illustrated a single pair of nail-driving elements comprising a nail-holding chuck 1 and a plunger holder 2, the former being suitably attached to a machine part 3, and the latter to a machine part 4, which parts are mounted for reciprocation with relation to each other. Usually, the holder 2 is mounted upon a reciprocating head 4 and the chuck 1 on a fixed part 3 of the machine frame, and this is the type of machine with which the present invention is illustrated. The nail-holding chuck 1 is of familiar form and includes a pair of jaws 5 and 6 pivoted to the chuck frame at 7 and 8 and normally urged toward each other by means of adjustable compression springs 9 and 10, respectively. Through the chuck and between the jaws 5 and 6 a plunger 11 attached to the holder 2 reciprocates and drives nails which are fed to the chuck through a suitable flexible conduit 12. The manner of feeding nails to the chuck and of reciprocating the head 4 are features of construction well known to those familiar with machines of this type, and hence are not illustrated herein.

In the practice of the invention, each plunger is independently locked or connected to the holder, and means, preferably in the form of a trip operated by the relative movements of the nail-driving elements, is provided for unlocking or releasing each plunger at variable relative positions of such elements, depending upon the elevation of the face of the article at the particular point where a nail is being driven.

In the embodiment of the invention specifically illustrated in the drawings, the plunger 11 is adapted to be locked in its holder 2 by means of a latch 14 pivoted at 15 to the holder, the plunger being provided with a head in the form of a block 13 having a beveled face 16 adapted to be engaged by an offset portion formed on the lower end of the latch. To hold the latch in plunger-locking position, a dog 17, normally pressed downwardly by means of a spring 18, is mounted for vertical reciprocation in holder 2, the dog being provided with a lateral projection 19 adapted to bear against a similarly formed projection 20 at the lower end of the latch. To adjust or vary the effective

length of the dog, its lower end may be provided with a set screw 24. The positions of the plunger 11, latch 14, and dog 17 for holding the plunger locked to the holder are indicated in Fig. 3.

For releasing the plunger-locking latch, a trip in the form of a plate 21 is borne preferably by chuck 1 in such position that its lower end may be brought to bear upon the face of the article being nailed. The trip may, as particularly illustrated in Fig. 4, have a dovetailed sliding connection with chuck 1, and may be provided at its upper end with a lateral projection 22 adapted to be engaged by the set screw 24 at the lower end of dog 17 when the holder 2 moves downwardly. For holding trip 21 normally above the face of an article 23 into which nails are being driven, a suitable spring 25 may be arranged between chuck 1 and the lateral projection 22 of trip 21.

In the operation of the machine, when the plunger holder 2 is raised, the lower end of plunger 11 is drawn upwardly through chuck 1 to such position that a nail fed through conduit 12 may fall downwardly between and be properly engaged by the spring-pressed jaws 5 and 6. After the holder 2 has been raised to such position that the set screw 24 at the lower end of dog 17 no longer bears upon the lateral projection 22 of trip 21, spring 18 presses the dog downwardly with the result that latch 14 is moved laterally toward block 13 to lock the plunger to the head. When the plunger holder moves downwardly, plunger 11 strikes the head of a nail engaged by the jaws 5 and 6 and presses or drives the nail into the article 23. The adjustment of holder 2 with relation to chuck 1 and of set screw 24 at the lower end of dog 17 is such that when the holder nears the end of its downward movement, set screw 24 bears upon the lateral projection 22 of the trip. The further downward movement of the holder causes trip 21 to also move downwardly until its lower end bears upon the face of the article into which the nail is being driven. Still further downward movement of the plunger holder causes dog 17 to move upwardly through the holder until the dog is in the position indicated in Fig. 1, at which time the beveled face 16 of block 13 at the upper end of the plunger forces the latch 14 to the right and permits the plunger to move upwardly. Thus, further driving of the nail is stopped.

It will be observed that the means for releasing the connection or locking of the plunger to its holder are rendered operative at a point in the downward movement of the holder depending upon the elevation of the face of the article at the particular point at which the nail is being driven. Thus, if the face is slightly elevated, the plunger will be released before the nail is driven too far into the article, and if the face of the article is low the plunger will continue to drive the nail until it has reached the proper depth. When a nail driving machine is provided with a plurality of coöperating nail-driving elements, each nail is independently driven to the required amount depending upon the elevation of the face of the article at the particular point at which each nail is driven.

According to the provisions of the patent statues, we have described the principle and operation of our invention, together with what we now consider to be the best embodiment thereof. However, we desire to have it understood that, within the scope of the appended claims, the invention may be practised with other forms of construction than that specifically shown and described.

We claim:

1. In a nailing machine, the combination with nail-driving elements comprising a nail-holding chuck and a plunger holder reciprocable with relation to each other, and a plunger borne by the holder and reciprocable in the chuck; of means for locking the plunger to said holder, and means operated by the relative movements of said elements for releasing said plunger-locking means at variable relative positions of said elements.

2. In a nailing machine, the combination with nail-driving elements comprising a nail-holding chuck and a plunger holder reciprocable with relation to each other, and a plunger borne by the holder and reciprocable in the chuck; of means for locking the plunger to said holder, and a trip borne by one of said nail-driving elements in position to bear upon the face of an article being nailed, said trip being movable with relation to said elements to release said plunger-locking means.

3. In a nailing machine, the combination with nail-driving elements comprising a nail-holding chuck and a plunger holder reciprocable with relation to each other, and a plunger borne by the holder and reciprocable in the chuck; of a latch for locking the plunger to the holder, a movable member for holding the latch in locking position, and a trip borne by one of said nail-driving elements in position to bear upon the face of an article being nailed and adapted to engage said latch-holding member.

4. In a nailing machine, the combination of a nail-holding chuck, a plunger holder reciprocable with relation thereto, a plunger borne by said holder and reciprocable in the chuck, a releasable latch for locking the plunger to said holder, and a trip borne by the chuck for releasing said latch at variable positions of said holder with relation to the chuck.

5. In a nailing machine, the combination of a nail-holding chuck, a plunger holder

reciprocable with relation thereto, a plunger borne by said holder and reciprocable in the chuck, a releasable latch for locking the plunger to said head, and a trip finger borne by the chuck in position to bear upon the face of an article being nailed and movable to release said latch at variable positions of said holder with relation to the chuck.

6. In a nailing machine, the combination of a nail-holding chuck, a plunger holder reciprocable with relation thereto, a plunger borne by said holder and reciprocable in the chuck, a releasable latch for locking the plunger to said holder, a movable member for holding the latch in plunger-locking position, and a trip arranged between said latch-holding member and the face of an article being nailed and adapted when bearing upon such face to move said member from latch-holding position.

7. In a nailing machine, the combination with nail-driving elements comprising a nail-holding chuck and a plunger holder reciprocable with relation to each other, and a plunger borne by the holder and reciprocable in said chuck; of a movable latch for locking the plunger to the holder, a movable dog for holding the latch in plunger-locking position, and a trip borne by one of said nail driving elements and arranged between said dog and the face of an article being nailed whereby said trip when bearing upon such face moves said dog to latch-releasing position.

8. In a nailing machine, the combination of a nail-holding chuck, a plunger holder reciprocable with relation thereto, a plunger borne by said holder and reciprocable in the chuck, a pivoted latch for locking the plunger to the holder, a movable dog spring-pressed toward latch-locking position, a trip finger slidably mounted on said chuck and arranged between said dog and the face of an article being nailed, the movement of the holder being effective to bring said dog in engagement with the trip finger whereby the dog is moved to latch-releasing position.

In testimony whereof, we hereunto sign our names.

JOSEPH F. PENNER.
ALDA A. LANSBERRY.

Witness:
EDWIN O. JOHNS.