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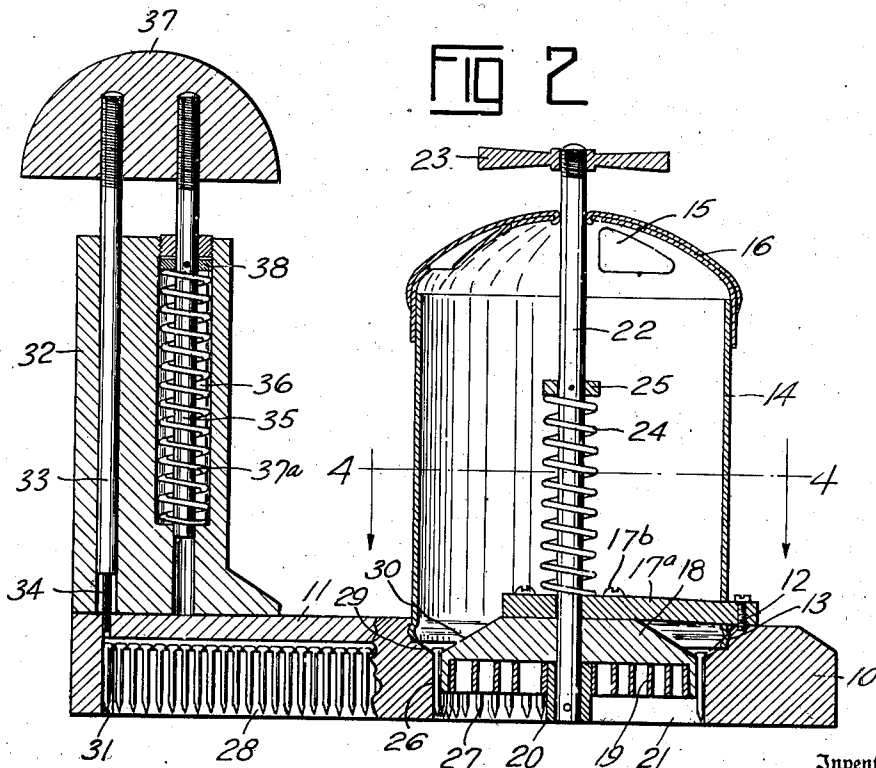
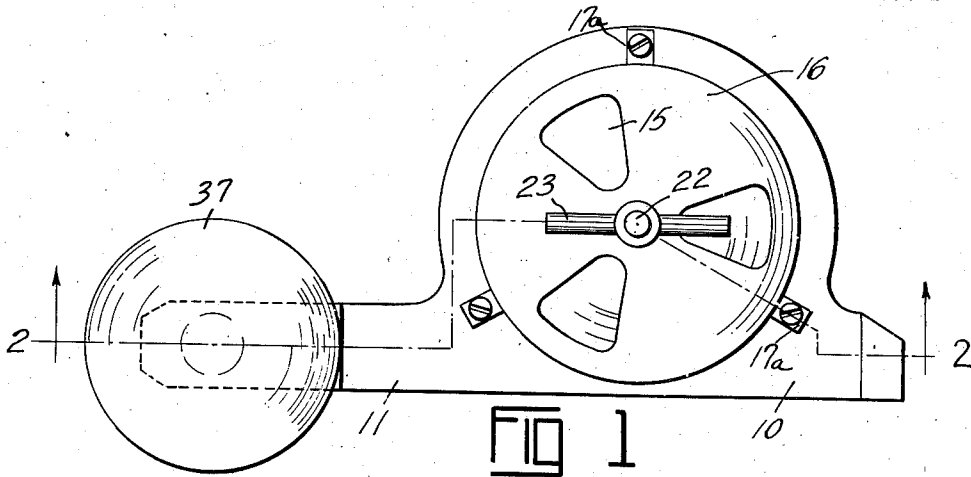
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2,379,826

HAND NAIL DRIVING AND COUNTERSINKING APPARATUS

Filed Jan. 11, 1943

2 Sheets-Sheet 1



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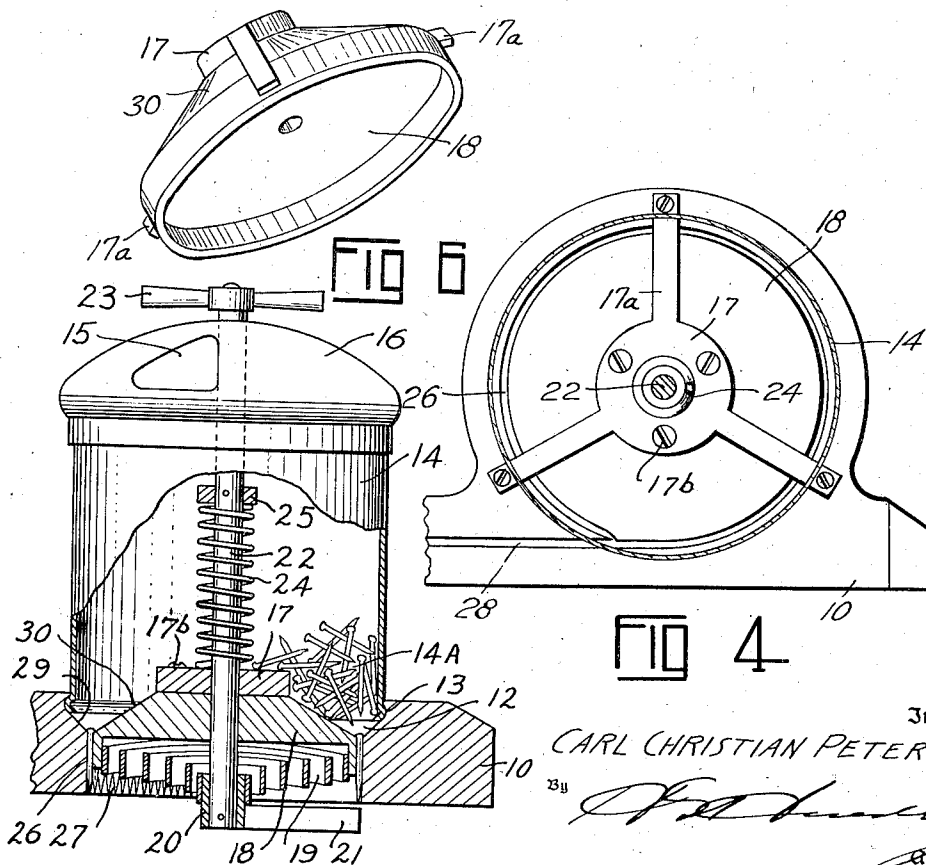
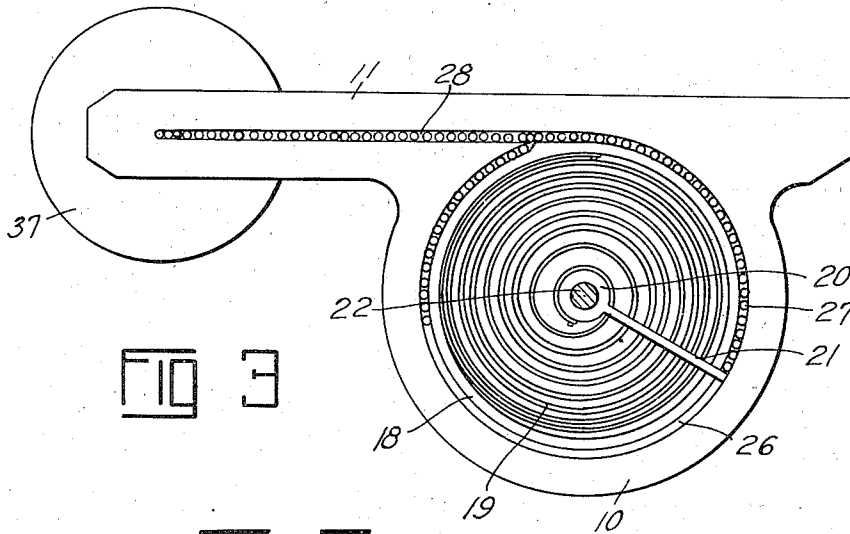
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UNITED STATES PATENT OFFICE

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HAND NAIL DRIVING AND COUNTERSINK-
ING APPARATUSCarl Christian Peterson, Burlington, Ontario,
CanadaApplication January 11, 1943, Serial No. 472,058
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5 Claims. (Cl. 1—46)

This invention relates to improvements in devices for presenting and driving nails and consists essentially of a base with provision for a train of nails and means for urging the train to a position in which the leading nail may be driven into the work, and each leading nail thereafter consecutively driven until the train is exhausted, and means for automatically replacing the exhausted train by a successor and so repeatedly until the exhaustion of a certain magazine.

The principal object of the invention is to generally improve the construction of automatic hand-nailing machines of the type particularly adapted for finishing nails and for such typical work as driving and countersinking such nails in glazing and panel beading and the like where driving the nails by hand often results in breakage or damage.

Another important object is to provide means in such a device for conveniently and rapidly recharging the feeding means.

Another important object is to provide means whereby a recharge of nails may be fed to the feeding means point-down and in line from a disarranged mass in the magazine.

Another important object is to provide a device of the kind described which will be simple, durable, efficient and inexpensive to produce and purchase.

With the above and other objects in view as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:

Figure 1 is a top view of an apparatus constructed in accordance with the present invention.

Figure 2 is a side elevation taken on the line 2—2 of Figure 1.

Figure 3 is a bottom view of the apparatus.

Figure 4 is a sectional top view taken on the line 4—4 of Figure 2.

Figure 5 is a perspective view of a certain spider and spring housing assembly.

Figure 6 is a partial sectional elevation similar to Figure 2 showing a certain shaft and pusher arm in depressed position.

In its present embodiment the invention consists of a round base 10 having a tangent-like extension 11. In the bottom of the round portion of the base is a round opening 12 enlarged at the

top, the enlargement having an annular groove which receives the bead 13 of the skirt of the cylindrical nail magazine 14. The magazine may be removed from its seat in the base by forcibly tilting it to one side and thereby flexing the skirt out of the groove and re-inserted by a reversal of the same procedure. The magazine contains the nail supply in a disarranged mass 14A and is filled through slide openings 15 in a closure cap 16.

Inside the magazine 14 is a spider consisting of a hub 17 having radial arms 17a extending therefrom. The arms of the spider extend through notches in the skirt of the magazine to the outside where they are bolted or otherwise suitably secured to the upper face of the base section 10. Secured by screws 17b or otherwise suitably secured to the spider underneath is a canopy-like housing 18 for a helical spring 19. One end of the spring is anchored to the internal face of the housing while the other end is secured to a vertically projecting portion of the hub 20 of a paddle-like pusher arm 21 which lies beneath the spring.

The nail feeding portion of the machine may be constructed as follows: The hub of the pusher arm 21 is pinned fast on the end of a vertical shaft 22 as indicated. The shaft 22 is sleeved through the housing 18, through the hub 17, and emerges through a central sleeve in the cap 16 where it is provided with a handle 23. A spiral expansion spring 24 disposed about the shaft 22 and compressed between the hub 17 and a collar 25 pinned on the shaft urges the shaft and the arm 21 to the working position shown, but when the shaft is moved downward against the urge of the spring 24 the bottom of the shaft together with the arm 21 emerges beneath the base and is free to be turned backwardly by means of the handle 23 for a purpose that will later appear. In moving down or depressing the arm 21 and while the arm continues to be depressed the spring 19 is deformed as indicated in Figure 6, that is to say the central part of the spring is carried downwardly with the hub 20 from its normal plane. On the rise of the arm 21 the spring 19 will elastically revert to its former normal position.

The intervening space between the annular housing 18 and the face of the opening 12 is merely greater than the diameter of the shank of the particular nail which the machine is dimensioned to accommodate, and this space forms an annular passage 26 for a train or bank of nails 27. The curving passage 26 merges with a straight

passage 28 in the base extension 11. It will be noted that the passages are open at the bottom of the base, and the nails are retained by the engagement of their heads on the shoulders of a chamfered enlargement of the passage 28, and in the passage 26 by the bevelled portion 29 of the opening 12 and the converging inclination 30 of the housing 18. The passage 28 terminates in an opening 31 extending through to the top as well as to the bottom of the base.

The nails are lodged point down in the passage 12 by agitating the device more or less violently, the pusher arm 21 first having been depressed or extruded then revolved against the urge of the spring 19, then retracted at a point close to the junction of the passages 26 and 28 and released. On release of the pusher arm it will push all the nails which have dropped point down in the passage 26 together and against those remaining in the passage 28. Thus the passage 26 is recharged as many times as there are sufficient nails for the operation remaining in the magazine.

Rising from the end part of the base extension 11 is a column 32, and operating in a sleeve in this column is a driver shaft 33 having a reduced portion 34 of the proper diameter to penetrate the opening 31 to engage the head of the leading nail of the train and to drive it. Moreover, the reduced portion 31 of the driver 33 is of a length greater than the thickness of the base portion 11 so that the nail as well as being driven is countersunk into the material with which the bottom face of the base is engaged by a single stroke of the driver. Also operating in the column in conjunction with the driver 33 is a plunger 35 reciprocally slidable in a cylinder 36. The upper ends of the driver 33 and the plunger 35 are companionably screwed into a rounded knob 37, and the distance they are screwed into this knob will control or adjust the length of the stroke of the driver and similarly the distance the nails are countersunk. In the cylinder 36 beneath the plunger is a spiral spring 37a expanding against a collar 38 on the plunger and the upper face of the base, and compressing on the down stroke of the plunger and driver and thereby urging the latter members to upper dead-centre in preparation for a subsequent stroke against the nail of the train following the one having been driven. Thus the nails are driven and countersunk in their consecutive order in the train by placing the opening 31 in registry with the point at which the nail is to be driven and striking the knob 37 by the palm of the hand, the clenched fist, or an instrument.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit there-

of. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

I claim:

1. In a nail driving apparatus including a base having a nail feed passage communicating at a tangent with an annular nail passage, the feed passage being adapted to receive a train of nails and subsequent replacement trains from the annular passage, said annular passage being adapted to receive replacement trains for impelled movement into the feed passage progressively as the nails in the feed passage are singly ejected, of a magazine associated with said base for containing a disarranged mass of nails having communication with the annular passage, a shaft centrally arranged in the magazine for turning and sliding movement therein, a pusher arm fixed to one end of the shaft in spring pushing engagement with the trains in the annular passage and adapted to be moved in and out of train engagement position and to be swung on the axis of the shaft with the shaft, and spring means associated with the shaft and pusher arm for urging the pusher arm against the train.

2. An apparatus as defined in claim 1 wherein the passages have shoulders and wherein the nails while in said passages are vertically suspended by their heads engaging the shoulders.

3. In a nail driving apparatus including a base having a nail feed passage, of a magazine associated with said base for containing a disarranged mass of nails, a stationary housing disposed in a circular opening in the base and spaced from the wall of the opening, the space between the wall of the housing and the wall of the opening forming an annular nail train passage communicating with said feed passage and with the magazine, a shaft centrally arranged in the magazine for turning and sliding movement therein and being sleeved through said housing, a helical spring in said housing, one end of said spring being anchored thereto and the other to a portion of the shaft, a pusher arm fixed to the shaft beneath said spring in spring pushing engagement with the train in the annular passage and adapted to be depressed out of train engagement position with and by means of the manual shifting of the shaft, then to resistingly swing with and by manual rotation of the shaft to a pick-up position and subsequently re-elevated similarly with and by the shaft to train engagement position.

4. An apparatus as defined in claim 1 including spring means for normally retaining the pusher arm in train engaging position.

5. An apparatus as defined in claim 3 including spring means for normally retaining the pusher arm in elevated position.

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