

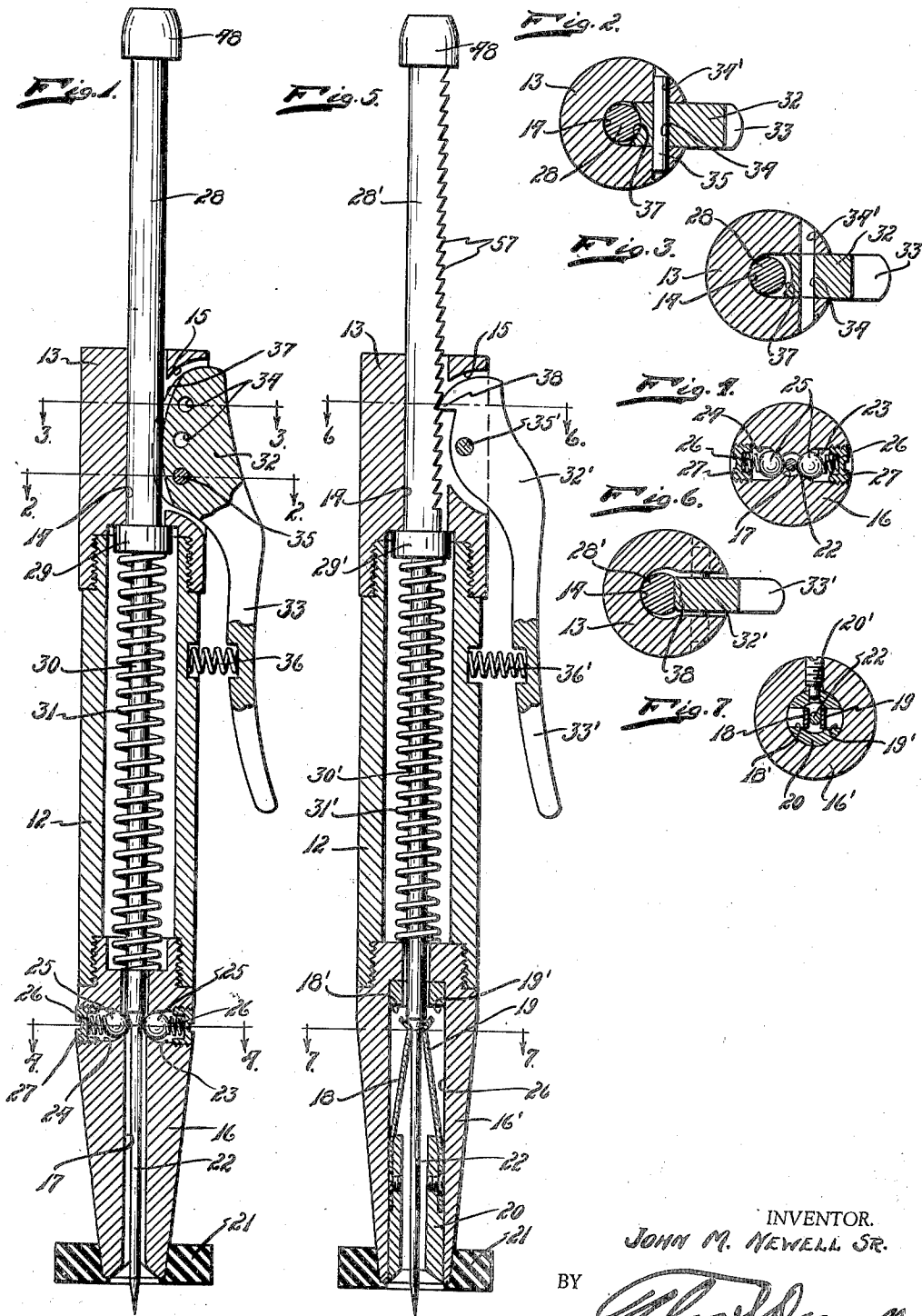
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NAIL DRIVER

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NAIL DRIVER

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2 Claims. (Cl. 1-47)

My invention relates to a new and useful improvement in a nail driver adapted for use in driving nails particularly of the type known as finishing nails which are generally countersunk in the body into which they are driven.

Another object of the present invention is to provide a device of this class whereby the nails may be quickly and accurately driven into place and countersunk at the same time.

Another object of the invention is the provision of a device embodying a driving plunger so arranged and constructed that it will automatically be locked in its various positions of movement when the nail is being driven and provided with means for easily and quickly releasing the driving plunger for movement to its initial or starting position.

Another object of the invention is the provision in a nail driver of this class of means for retaining the nail in position prior to the impact of the driving plunger thereagainst.

Another object of the invention is the provision of a nail driver which will be light, durable, compact, highly efficient in use and easily operated.

Another object of the invention is the provision of a nail driver of this class having a plunger constantly in contact with the head of the nail during the driving operations.

Other objects will appear hereinafter.

The invention consists in the combination and arrangement of parts hereinafter described and claimed.

The invention will be best understood by a reference to the accompanying drawing which forms a part of this specification, and in which, Fig. 1 is a longitudinal, central, sectional view of the invention.

Fig. 2 is a sectional view taken on line 2-2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3-3 of Fig. 1.

Fig. 4 is a sectional view taken on line 4-4 of Fig. 1.

Fig. 5 is a longitudinal, central, sectional view of a modified form of the invention.

Fig. 6 is a sectional view taken on line 6-6 of Fig. 5.

Fig. 7 is a sectional view taken on line 7-7 of Fig. 5.

As shown in the drawing the invention comprises a hollow body 12 which serves as a gripping portion and on the upper end of which is threaded a head 13 having a bore 14 formed therethrough communicating with the laterally positioned recess 15. Threaded on the lower end of the member 12 is a guide tip 16 having a bore 17 formed centrally therethrough.

Formed in this guide tip 16 are the radial passages 23 and 24 in each of which is positioned

a ball 25 thrust inwardly so as to project into the bore 17 by means of the spring 26 which is held in position by the plug 27. These balls 25 serve as retainers for gripping the opposite sides of the finishing nail 22 which is positioned in the bore 17.

Slideably projected through the bores 14 formed in the head 13 is a rod 28 having the striking head 43 formed at its upper end. Fixedly mounted on the inner end of the rod 28 within the barrel 12 is a collar 29 and a driving plunger 30 of reduced diameter forms an extension of the rod 28 projecting beyond the location of the collar 29. Embracing this driving plunger 30 is a spring 31 one end of which engages against the collar 29 and the other end of which engages against the end of the guide tip 16. As clearly appears in Fig. 1, the driving plunger 20 engages its end with the head of the nail 22 when the same is held in position between the retaining balls 25. The construction is such that when the rod 28 is driven downwardly the driving plunger 30 will move the nail 22 outwardly of the tip 16. Mounted on the end of the tip 16 is an abutment shoe 21 formed from rubber or other suitable flexible material which would rest against the surface into which the nail 22 is to be driven. It will be noted that the shoe 21 projects beyond the end of the tip 16 so that the end of the tip 16 cannot come into contact with the surface into which the nail is to be driven. The driving plunger 30 is of sufficient length as to project beyond the end of the tip 16 when it is moved downwardly and this projection is sufficient to countersink the nail 22 in the surface into which it is driven.

An engagement pawl 32 is positioned in the recess 15 and pivots on the pin 35. This pin may be projected through the pawl at any one of the openings 34 formed therein. Extending outwardly from the pawl 32 is a gripping handle 33 whereby the pawl may be rocked on its pivot, the spring 36 serving to normally retain the handle rocked outwardly from the barrel 12. The inner face of the pawl is provided with a groove 37 which embraces the rod 28, the groove 27 serving as a cam surface to lock the rod 28 from moving upwardly in response to the pressure of the spring 31. The construction in the mounting shown in Fig. 1 is such that as the rod 28 is driven downwardly, this rod will slide along the groove 37 but the spring 36 will retain the pawl 32 rocked to a position so that should the rod attempt to move outwardly in response to the pressure of the spring 31, the cam surface would serve to bind the rod against such outward movement. To release the rod for outward movement, it would be but necessary to rock the pawl 32 by pressing the handle 33 inwardly toward the barrel 12 against the compression of the spring 36.

If the pivot pin 35 were mounted at the central opening 34, the pawl would serve as a binding member when rocked in either direction. It would serve to lock the plunger from downward movement when the pawl is acted upon by the force of the spring 36, and to prevent upward movement of the plunger when the handle 33 is pressed inwardly by the operator. In order to position the pawl so that it will permit the plunger to move in either direction it will be necessary to rock and hold the pawl in its neutral position, that is, in a position where the cam surfaces on either side of the pivot point of the pawl will not contact the driver. If the pivot pin 35 is projected through the upper opening 34, it would be necessary to retain the handle 33 pressed inwardly toward the barrel 12 in order to effect the locking engagement. In such a mounting, the operator would hold the device with his fingers around the handle 33 when driving the rod 28 downwardly and when it was desired to permit the rod 28 to return to its initial position the inward pressure on the handle 33 would be released and the spring 36 would function to move the pawl 32 to releasing position.

In Fig. 5 I have shown a slightly modified form of construction in which the rod 28', which corresponds to the rod 28, is provided with ratchet teeth 57 adapted to engage the ratchet dog 38 projecting outwardly from the pawl 32' which carries the gripping handle 33' pressed outwardly by the spring 36'. It is believed that the operation of this locking mechanism is obvious from the description and illustration. The ratchet dog 38 serving to engage each successive tooth 57 as the rod 28' is driven inwardly and a pressing of the handle 33' inwardly toward the barrel 12 effecting the release.

The collar 29' corresponds to the collar 29 and projecting outwardly from this collar is the driving plunger 39' embracing which is the spring 31. Inserted in the guide tip 16' is a barrel 20 having slots 18' and 19' formed therein. Secured to the barrel 20 at one of their ends, are leaf springs 18 and 19 which flex inwardly in the slots 18' and 19', respectively, and serve to releasably engage the nail 22. These resilient holding members 18 and 19 correspond to and perform the function of the spring press balls 25. This barrel 20 is positioned in the enlarged opening 20' formed in the tip 16' and snugly engages therein as a press fit. By removing the barrel and replacing it with one having differently spaced springs 18 and 19 the device may be adjusted for various size nails. Mounted on the end of the guiding tip 16' is the yieldable contact shoe 21.

In use, the nails are inserted into the device through the end of the guiding tip 16 or 16' until the head passes beyond the balls 25 or the curved terminal portion of the springs 18 and 19. When this has been accomplished, the nail will be held in the position shown in Fig. 1 and Fig. 4. When the nails have been secured in the device in this manner, they may be easily and quickly driven into the body to be nailed and countersunk at the finishing of the driving operation. The nails may be driven in without danger of bending and by counter-sinking the nail at the last driving blow, considerable time will be saved.

Carpenters frequently, by hand, press a number

of nails into the wood to be nailed and then proceed to successively drive these nails, individually, into the wood. The present device would not interfere with such a practice of nailing as the tip 16 or 16' would then be thrust over each nail which had been started by hand pressure into the wood and the driving of the nail proceeded with in the usual manner.

Experience has shown that the device makes it possible to considerably speed up the work of driving nails, particularly finishing nails, which are countersunk after the driving operation. The compactness of the device permits its use in very close quarters in corners and the like so that the tool is practicable for all purposes. It is light and its durability is believed obvious from the type of construction illustrated.

While I have illustrated and described the preferred form of construction, I do not wish to limit myself to the precise details of structure shown, but desire to avail myself of such variations and modifications as may come within the scope of the appended claims.

What I claim as new is:

1. A nail driver of the class described, comprising: a tubular handle; a head on one end of said handle and having a bore formed therethrough axially thereof; a guide tip on the opposite end of said handle and having an axially directed bore formed therethrough; a rod slidably projected through the bore of said head and projected at one end into said handle; a driving plunger carried by the inner end of said rod and extending axially of said handle and projectible at an end into the bore formed in said tip for driving therefrom a nail positioned therein; a spring for normally maintaining said rod thrust outwardly for retaining said plunger in normal position; rockable releasable means engageable with said rod for releasably securing the same in its various positions of inward movement, said means having a plurality of spaced openings formed therethrough for reception of a pivot pin; and a pivot pin projectible through said openings selectively for pivotally mounting said means on said head.

2. A nail driver of the class described, comprising a tubular handle; a head on one end of said handle and having a bore formed therethrough axially thereof; a guide tip on the opposite end of said handle and having an axially directed bore formed therethrough; a rod projected through the bore of said head and projected at one end into said handle; a driving plunger carried by the inner end of said rod and extending at one end into the bore formed in said tip for driving therefrom a nail positioned therein; a spring for normally maintaining said rod thrust outwardly for retaining said plunger in normal position; a cam mechanism mounted rockably on said head and engageable with said rod for preventing axial movement of the same; a handle mounted on and projecting outwardly from said cam mechanism for affording means for rocking said cam mechanism on its mountings into non-engaging position relatively to said rod; and resilient means engageable with said first mentioned handle and said second mentioned handle for resisting rocking movement of said cam mechanism in one direction.

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