

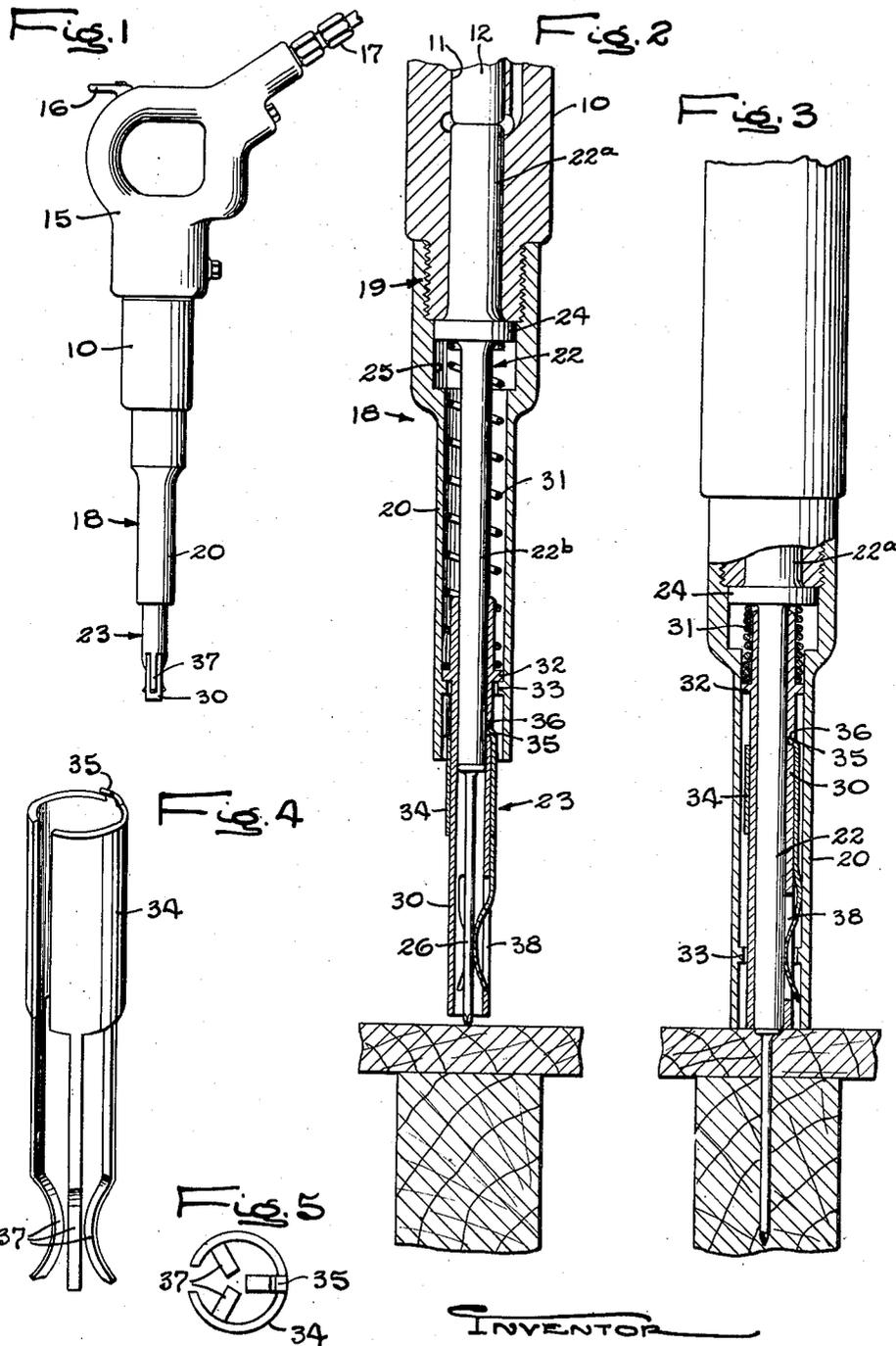
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POWER-OPERATED NAIL DRIVER

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## POWER-OPERATED NAIL DRIVER

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The present invention pertains to power operated tools and more particularly to power actuated nail drivers.

The primary object of the invention is to provide in a tool of the above character means to receive a nail and to guide it throughout its travel as it is driven.

A more specific object is to provide in a power operated hammer means to hold a nail inserted therein which guides the nail into the work throughout its travel and which operates to prevent the tool from slipping off the nail during the driving thereof.

Other objects and advantages of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of a pneumatic hammer in which the present invention is incorporated.

Fig. 2 is a sectional view on an enlarged scale of the lower end of the hammer illustrated in Fig. 1 and showing the components in position for driving a nail.

Fig. 3 is an elevation partly in section of the lower end of the hammer illustrated in Fig. 1 and showing the components in position after the nail has been driven.

Fig. 4 is a perspective view of the spring clip used to hold a nail in position for driving.

Fig. 5 is a plan view of the spring clip shown in Fig. 4.

While the invention is susceptible of various modifications and alternative constructions, there is shown in the drawings and will herein be described in detail the preferred embodiment, but it is to be understood that it is not thereby intended to limit the invention to the form disclosed, but it is intended to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Generally stated, my invention resides in the provision of a portable power operated hammer having means to receive a nail and operable both to guide the nail throughout its travel as it is being driven into the work and to prevent the hammer from accidentally slipping off the nail. Additionally, provision is made to releasably hold the nail in the aforesaid guide means in position to be driven. More particularly, I provide a power operated hammer having a nail guide therein mounted for limited sliding movement relative to a driving member or nail set and adapted to receive a nail therein, and further

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having resilient holding means co-acting therewith to releasably hold a nail in position to be driven, the nail guide encompassing the entire protruding portion of the nail to the end that the nail is prevented from being bent and the hammer is prevented from slipping off the nail during the driving thereof.

Referring now to the drawings, my invention has been shown for purposes of illustration as embodied in a portable pneumatic hammer comprising a cylinder 10 having a chamber 11 therein within which reciprocates a piston or hammer member 12. Fixed to the rear or the upper end of the cylinder 10 is a handle section 15 within which are disposed valve mechanisms including a control valve (not shown) arranged for actuation by a finger piece 16. Pressure fluid to actuate the tool is supplied from any suitable source (not shown) by way of an inlet fitting 17.

Projecting from the forward end of the cylinder 10 is a nail driver section generally designated 18. As shown, this section is in the form of an attachment removably secured to the end of cylinder 10 as by screw threads at 19. It includes a barrel 20, a reciprocable nail set 22 and nail guide means 23. Preferably the barrel 20 is of hollow cylindrical form.

The nail set 22 is disposed within the barrel 20 and has an upper portion 22a received in the end of the chamber 11 in the cylinder 10 thus providing an anvil against which the hammer member 12 strikes. Adjacent the anvil portion 22a the nail set is provided with an outwardly extending collar 24 which is received in a chamber 25 defined by the end of the cylinder 10 and a counterbore in the barrel 20. The abutment of the collar 24 with the end of the cylinder 10 and the bottom of the chamber 25 serves to limit the reciprocatory movement of the set. The lower end of the nail set forms a driver portion 22b therefor which is of reduced diameter and has its outer end adapted to engage the head of a nail 26 which is to be driven.

In the present instance the nail guide means 23 provided to receive the nail 26 to be driven and guide it throughout its travel includes a tube 30 having an inner diameter substantially corresponding to the diameter of the head of a nail to be driven by the tool. The tube 30 is disposed within the barrel 20 and mounted for limiting sliding movement therein relative to the nail set 22. The driver portion 22b of the nail set 22 extends into the upper end of the nail guide 23 where its lower end engages the head of the nail 26.

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The nail guide 23 is urged outwardly by means of a spiral spring 31 interposed between a shoulder 32 on the tube 30 and the collar 24 on the nail set 22. The outward movement of the guide 23 is limited by means of an inwardly extending annular shoulder 33 adjacent the lower end of the barrel 20.

To releasably hold the nail 26 when it is inserted in the tube 30 a spring clip 34 also forming a part of the guide means 23 is provided. Preferably the clip 34 has a portion thereof in the form of a split sleeve which is telescoped over the guide 30 and has a tang 35 thereon engageable in an opening 36 in the guide 30 to retain the clip in place. Integrally formed with and extending from the sleeve portion of the clip 34 are a plurality of spring fingers 37. These fingers are operable through correspondingly positioned slots 38 in the nail guide 30 to grip the nail 26 when it is inserted therebetween and to releasably hold it in position for driving.

From the foregoing, it will be apparent that a nail inserted in the tool has its head in engagement with the inner surface of the tube 30, and its shank is gripped by the fingers 37. Thus it is releasably held, at spaced points, in axial alignment with the tool thereby insuring that it will be driven straight into the work.

To operate the tool a nail is inserted in the end of the guide 30 and its head is forced between the spring fingers 37 into engagement with the driver portion 22b of the nail set 22, the body of the nail being gripped by the spring fingers 37 to releasably hold it in a central position within the nail guide 23 and in position for driving. The tool is then brought into position on the workpiece and the finger piece 16 is pressed to admit pressure fluid to the tool to initiate its operation. Pressure exerted by the operator together with the weight of the tool holds the nail set 22 in engagement with the head of the nail. The spring 31 urges the nail guide into engagement with the workpiece and as the nail 26 is driven the nail guide 23 is telescoped within the barrel 20.

It is to be noted especially (Fig. 3) that the nail guide 23, the driver portion 22b of the nail set 22 and the barrel 20 are of corresponding length. Thus when the nail is completely driven and its head is flush with the surface of the workpiece, the end of the barrel 20 engages the surface of the workpiece. This serves to indicate to the operator when the nail has been completely driven. An additional advantage that flows from this construction is that it minimizes the possibility of the tool slipping off the edge of the work if the operator should remove pressure from the tool before interrupting the supply of pressure fluid to the tool when the nail head is flush with the surface of the workpiece. By making the barrel 20 of a length to engage the work when the nail head is flush, additional end area engaging the work is provided and the fingers 37 which are forced outwardly by the nail set 22 are protected and prevented from being bent or broken.

I claim as my invention:

1. A power operated hammer comprising in

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combination, a cylinder having a hammer member reciprocable therein, a barrel secured to and projecting from the forward end of said cylinder, a nail guide mounted for limited sliding movement in the barrel, means to releasably hold a nail in the nail guide, a nail set reciprocable in said barrel having a driver portion extending into said nail guide to engage the head of the nail and an anvil portion extending into said cylinder to be struck by said hammer member, and spring means operable between said nail set and said nail guide to urge the latter outwardly.

2. A nail driving attachment for a power operated hammer comprising, in combination, a barrel adapted to be secured to said hammer, a nail guide telescopically received in the barrel and having slots adjacent its outer end, a nail set reciprocable in the barrel and having one end extending into the nail guide, and means providing spring fingers operable through said nail guide slots to receive a nail therebetween and hold the same in position to be driven.

3. A nail driving attachment for a power operated hammer comprising, in combination, a barrel adapted to be secured to said hammer, a nail guide telescopically received in the barrel and having slots adjacent its outer end, a nail set reciprocable in the barrel and having one end extending into the nail guide, and a clip telescoped over said nail guide having spring fingers extending through said nail guide slots to receive a nail therebetween and hold the same in position to be driven.

4. A nail driving attachment for a power operated hammer having a hammer member reciprocable therein, comprising, in combination, a barrel adapted to be secured to said hammer, a nail guide telescopically received in said barrel and having an outwardly extending shoulder adjacent the inner end thereof, means to releasably hold a nail in said nail guide, a nail set reciprocable in said barrel and having the outer end thereof extending into the inner end of said nail guide to engage a nail therein and its inner end adapted to be struck by said driving member, said set further having an outwardly extending collar adjacent its inner end, a spring interposed between said nail guide shoulder and said nail set collar urging the nail guide outwardly, and a shoulder in said barrel providing a limiting abutment for engagement by said nail guide shoulder to retain the nail guide within the barrel.

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