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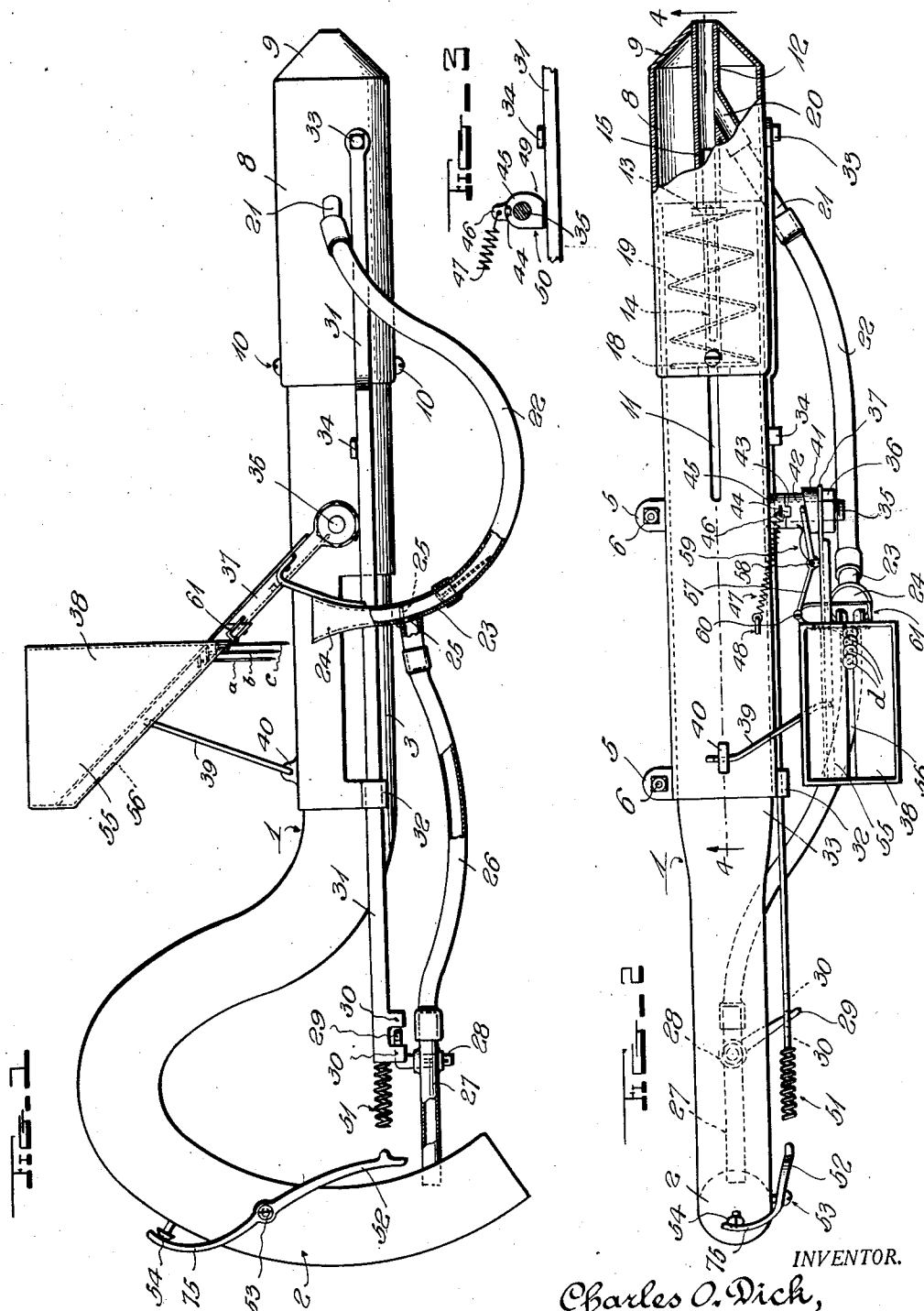
C. O. DICK

1,618,367

NAIL DRIVING ATTACHMENT FOR PNEUMATIC HAMMERS

Filed March 12, 1926

2 Sheets-Sheet 1



INVENTOR

Charles O. Dick,
BY

BY

Brady
ATTORNEY

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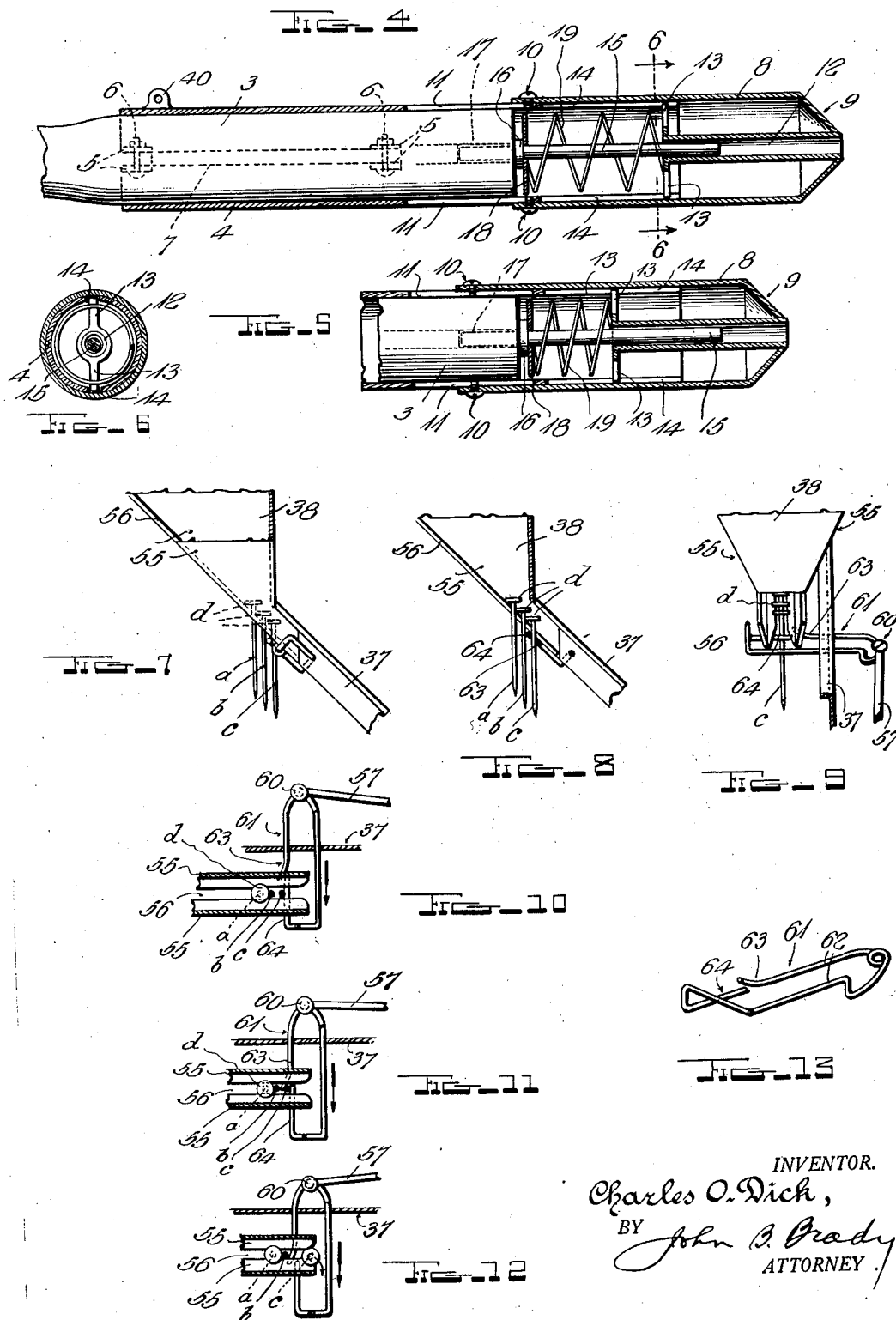
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NAIL DRIVING ATTACHMENT FOR PNEUMATIC HAMMERS

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2 Sheets-Sheet 2



INVENTOR.
 Charles O. Dick,
 BY John B. Brady
 ATTORNEY.

Patented Feb. 22, 1927.

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UNITED STATES PATENT OFFICE.

CHARLES O. DICK, OF GLENWOOD, IOWA, ASSIGNOR OF ONE-HALF TO CLIFFORD SAAR,
OF GLENWOOD, IOWA.

NAIL-DRIVING ATTACHMENT FOR PNEUMATIC HAMMERS.

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My invention relates broadly to pneumatic hammers and more particularly to a nail driving attachment for pneumatic hammers.

5 One of the objects of my invention is to provide a simplified construction of nail driving attachment for pneumatic hammers, whereby the attachment may be applied to standard constructions of pneumatic hammers for the driving of nails in expediting building construction.

Another object of my invention is to provide a simplified construction of nail driving attachment for pneumatic hammers in which the delivery of nails to a driving head may be timed automatically with the application of the tool to the work.

20 Still another object of my invention is to provide a nail driving attachment for pneumatic hammers in which an automatic feed device is arranged to deliver to the head of the tool a nail to be driven at each time that the tool is presented to the work.

25 Still another object of my invention is to provide a timing mechanism for a nail driving apparatus by which successive feeding and delivery of nails may be secured automatically with the application of the tool to the work.

30 A further object of my invention is to provide a simplified construction and arrangement of parts for the automatic delivery and driving of nails under control of an operator for saving time and labor in the driving of nails.

A still further object of my invention is to provide a nail driving attachment for pneumatic hammers wherein an adjustable nail feeding hopper is provided by which the angular position of the hopper with respect to the axis of the barrel may be changed to permit the tool to be interchangeably used in either a vertical or horizontal position.

5 Other and further objects of my invention will be understood from the following specification by reference to the accompanying drawings, wherein:

Figure 1 is a side elevation of a pneumatic hammer illustrating the application of the attachment device of my invention and showing parts of the attachment broken away and in cross-section; Fig. 2 is a top plan view showing the arrangements of parts of the pneumatic hammer and the nail

driving attachment connected therewith; Fig. 3 is a detailed view illustrating a portion of the operating mechanism for insuring the delivery of nails to the pneumatic hammer; Fig. 4 is a longitudinal cross-sectional view of the barrel of the nail driving attachment showing the attachment in position ready to receive nails from the feeding mechanism; Fig. 5 is a cross-sectional view similar to the view illustrated in Fig. 4 showing the spring mechanism within the barrel of the nail driving attachment partially contracted during the application of the tool to the work; Fig. 6 is a cross-sectional view through the barrel of the nail driving attachment taken on line 6-6 of Fig. 4; Figs. 7, 8 and 9 are views of the nail feeding mechanism; Figs. 10, 11 and 12 are views illustrating the several positions of the nail delivery device during the operation of the tool; and Fig. 13 is a perspective view of the nail delivery device.

Referring to the drawings in detail, reference character 1 designates the pneumatic hammer as a whole which is supplied with 80 air pressure from any suitable source through any suitable hose which has not been illustrated. Reference character 2 designates the handle of the pneumatic hammer having barrel 3. A housing 4 comprising the nail driving attachment extends over the pneumatic hammer 3 and is secured thereto by means of bolts 6 which pass through lug members 5 on the barrel 4 as indicated at 7. The nail driving attachment 4 is thus 85 removably secured over the barrel 3 and may be tightened thereover by means of the bolts 6. The nail driving attachment includes a tubular sleeve 8 with a conical head 9 for application to the work. Guide screws 10 enable the sleeve 8 to be maintained in a given 90 plane along the length of the barrel 3, the screws 10 projecting into slots 11 formed in the attachment 4. The sleeve 8 has an internal tubular portion 12 therein with a supporting spider 13 at the inner end thereof slidable in slots 14 in the attachment 4. The tube 12 forms a cylinder in which the driving head 15 reciprocates as a plunger. 100 The driving head 15 is enlarged at 16 and fits into the head of the pneumatic hammer as at 17. A washer member 18 is secured over the plunger 15 in abutment with collar 16 for confining spring 19, the opposite end of which abuts against the arms of 110

the spider 13. An angularly disposed tubular sleeve member is provided in connection with one side of the tube 12 and to this extension a flexible tube 22 is secured which connects with the metallic T member 23. The T 23 terminates in a funnel shaped inlet 24 and has a flap valve 25 located at its center. Flexible tube 26 extends from the T section 23 to the tube 27 having valve 28 interposed therein. The tube 27 connects with the main source of air pressure which supplies the pneumatic hammer enabling pressure to be established in the mechanism of the nail driving attachment. The valve 28 is provided with a swivel control member 29 which is engaged on opposite sides by arms 30 which project from the longitudinally extending rod member 31. The rod member 31 is pivotally secured at 33 to the sleeve 8 and is guided through guide lugs 32 in the body portion 4 of the nail driving attachment enabling reciprocatory movement of the control rod 31 to be obtained. The casing or body portion 4 of the nail driving attachment is provided with a laterally extending pivotal stud 35 which has a nut 36 secured thereon for clamping an arm 37 in position with respect to the nail driving attachment. The arm 37 forms a support for nail hopper 38 which is held in position by a member 39 carried by the lug 40 on the casing 4. The stud 35 has a cam member 41 thereon with a diametrically reduced portion 42 and a notch 43 thereon. A lug 44 carried by coacting member 45 is secured on the stud 35 in such manner that spring 47 secured between the lug extension 46 on the coacting member 45 and a point 48 on the casing 4 tends to urge the flat face of the cam into contact with the longitudinally extending rod member 31. The coacting member 45 is provided with a substantially round face 49 and a substantially flat face 50. The movement of rod member 31 is restrained by means of spring 51 which may contact with the end of lever 52. The lever 52 is pivoted at 53 to the pneumatic hammer and is provided with an extension 75, the end of which contacts with the head of the supply valve 54 for depressing the said valve.

The nail hopper 38 is provided with side portions 55 which terminate in guides on opposite sides of a longitudinally extending inclined slot 56 down which nails *a*, *b* and *c* may slide in vertically depending positions. The nail discharge organization comprises a bell crank 57 pivoted at 58 and spring pressed as at 59. The bell crank 57 is pivotally connected at 60 with a nail delivery device 61 which is shown more clearly in perspective view in Fig. 13. The nail delivery device 61 is provided with arms 62, 63, and 64, the arm 63 being bent outwardly and terminating past the end of arm 64 and

spaced therefrom to receive a nail by gripping the nail beneath the head thereof as represented in the drawings.

In Fig. 10 I have shown the normal position of the nail delivery device where the nails *a*, *b* and *c* are prevented from sliding down the inclined slot 56 by reason of the fact that the heads *d* of the nails engage opposite sides 55 of the slot 56 and normally ride against the abutment offered by arm 64, of the delivery device 61.

In Fig. 11, however, I have shown the nail delivery device moving over in such position that the nail *c* is gripped between the arms 63 and 64. In Fig. 12 continued movement of the nail delivery device is shown where the coaction of the sides 55 of slot 56 and arms 63 and 64 has entirely released the nail *c* from support leaving the nail free to drop into the funnel 24 of the nail feeding mechanism. The delivery of the nail into the funnel 24 is timed in such manner that at this instance flap valve 25 is closed in full line position represented in Fig. 1, permitting the nail to drop in the dotted line position with the tube 22. Further timing of the air supply results in the opening of flap 25 leaving a free passage for compressed air from tube 26 through tube 22 for blowing a nail into the tubular driving head 12 after which the plunger 15 operates against the head *d* of the nail for driving the nail into the work.

The coaction of parts of the mechanism will be further understood when it is considered that the operator first presses the conical nose of the tool against the work. This results in the sleeve 8 riding back over the casing 4 being guided exteriorly by screw members 10, riding in slots 11 and interiorly by means of the arms of the spider 13 riding in the slots 14 in the tubular casing 4. The sleeve 8 moves back over the barrel of the pneumatic hammer against the action of spring 19 and in this backward movement rod 31 is forced backwardly in such manner that spring 51 engages the end of the lever 52. The lug 34 engages the cam 45 moving leg 44 which in turn rotates the cam 41 reciprocating the bell crank 57. By this operation a nail is deposited in the funnel 24. Upon continued movement of the rod member 31 spring 51 forces lever 52 to such a position that valve 54 is opened allowing air pressure to be fed to the pneumatic hammer and to be supplied through tubular member 27. Movement of rod 31 has at this time caused the opening of valve 28 by reason of the coaction between lug members 30 and arm 29 of the valve. Air is thus supplied under pressure through tube 26 opening valve 25 and blowing the nail which has dropped down the throat of funnel 24 into a position within the tubular member 12 where the plunger head 15 operates under

the normal reciprocal force of the pneumatic hammer to drive the nail into the work.

The operations thus described may be repeated for successive applications of the tool to the work and in this manner time and labor may be saved in the process of nailing. The nail hopper 38 is pivotally mounted with respect to the body of the tool in order to permit the tool to be used in either a vertical or horizontal nailing position. By changing the position of the nail hopper with respect to the body of the tool an operator may work with the tool in a vertical position, as for example, in the lathing of a ceiling or by fixing the hopper in the position illustrated in Figs. 1 and 2 of the drawings, the tool may be readily used in a horizontal position.

While I have described my invention in certain preferred embodiments, I desire that it be understood that modifications in the construction and arrangement of parts of the tool may be made and that no limitations upon the invention are intended other than those imposed by the scope of the appended claims.

What I claim and desire to secure by Letters Patent of the United States is as follows:

1. A nail driving attachment for pneumatic hammers comprising a supporting structure adapted to be secured over a pneumatic hammer, a reciprocatory sleeve carried by said supporting structure and arranged to envelope the driving head of said pneumatic hammer, a central nail guide internally positioned in said reciprocatory sleeve, a nail feeding hopper carried by said supporting structure, a nail delivery conduit extending between said nail feeding hopper and the central nail guide of said reciprocatory sleeve, and a common actuator arranged to be moved simultaneously with the reciprocatory motion of said sleeve for effecting a selection and delivery of a nail from said nail feeding hopper to said nail delivery conduit and for subsequently causing a supply of compressed air to be delivered to said nail delivery conduit for blowing nails successively to said central nail guide for the driving operation of said pneumatic hammer.

2. A nail driving attachment for pneumatic hammers comprising a supporting

structure adapted to be secured over a pneumatic hammer, a reciprocatory sleeve carried by said supporting structure and arranged to envelope the driving head of said pneumatic hammer, a central nail guide internally positioned in said reciprocatory sleeve, a nail feeding hopper carried by said supporting structure, a nail delivery conduit extending between said nail feeding hopper and the central nail guide of said reciprocatory sleeve, a longitudinally extending rod secured to said reciprocatory sleeve and arranged to be moved longitudinally of said pneumatic hammer for effecting the selection and delivery of a nail from said nail feeding hopper to said nail delivery conduit, and a valve controlled by the movement of said rod for admitting air under pressure to said nail delivery conduit for blowing nails periodically to a position in said central nail guide for the driving operation of said pneumatic hammer.

3. A nail driving attachment for pneumatic hammers comprising a structure arranged to be secured over the body of a pneumatic hammer, said structure carrying a spring pressed reciprocatory sleeve arranged to envelope the driving head of said pneumatic hammer, a central nail guide internally positioned within said sleeve, a stud carried by said structure, a cam member mounted to rotate on said stud, a nail feeding hopper supported on said structure, a bell crank arranged to be moved by said cam, a nail selection device carried by said bell crank and arranged to be moved beneath said nail feeding hopper, a nail conveying conduit supported by said structure and extending to said central nail guide, a valve for admitting compressed air to said nail conveying conduit, and a longitudinally extending actuator arranged to move simultaneously with the motion of said reciprocatory sleeve for operating said cam and effecting a selection and delivery of a nail into said nail conveying conduit and subsequently controlling said valve for admitting compressed air to said conduit for blowing a nail into said central nail guide for the driving operation of said pneumatic hammer.

In testimony whereof I affix my signature.

CHARLES O. DICK.