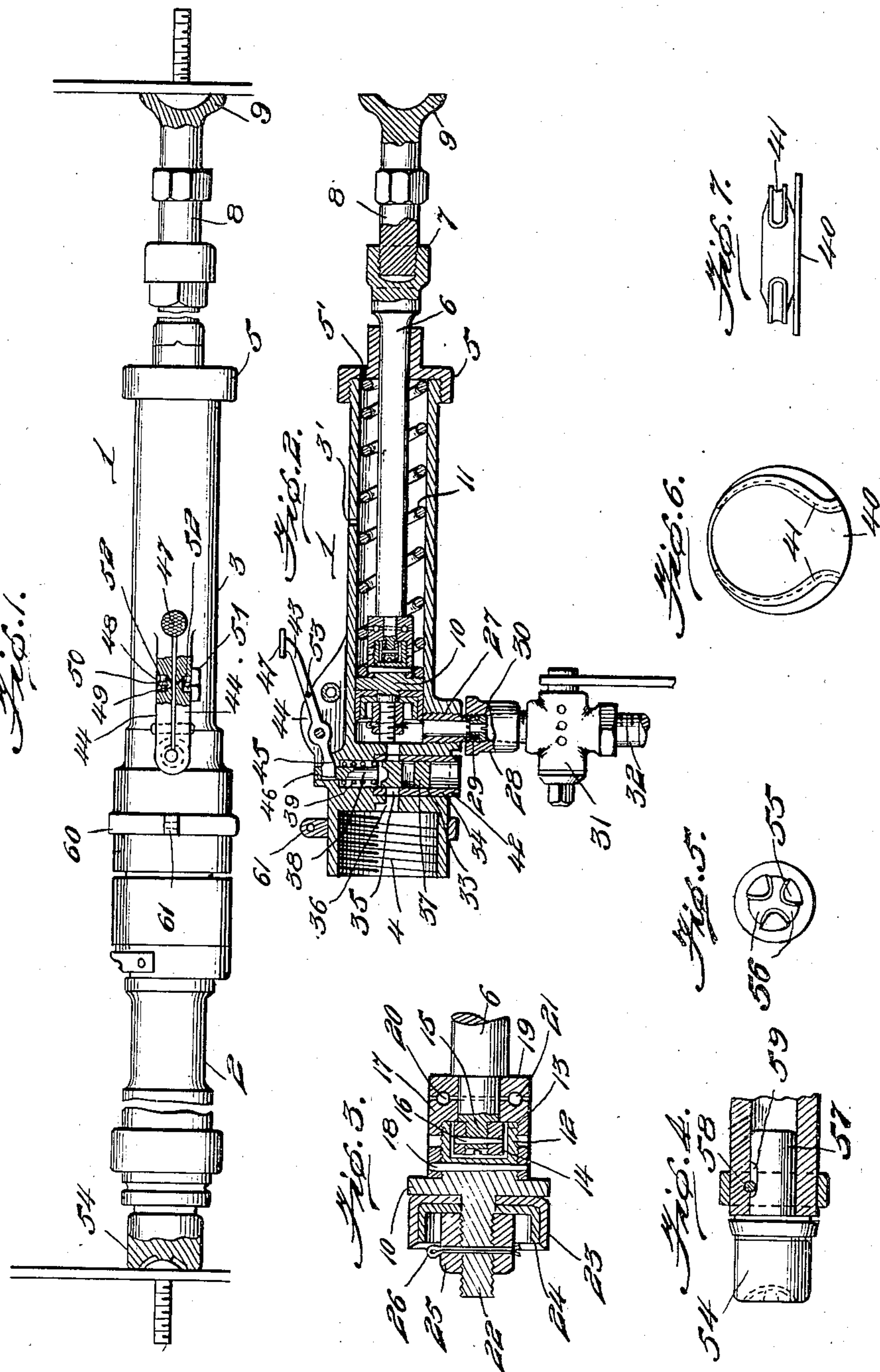


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PNEUMATIC HAMMER SUPPORT.  
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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC HAMMER-SUPPORT.

958,669.

Specification of Letters Patent.

Patented May 17, 1910.

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*To all whom it may concern:*

Be it known that I, HARRY NEVILLE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Pneumatic Hammer-Supports; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in pneumatic hammer supports.

The object of the invention is to provide a yielding pneumatic hammer support which, while holding the hammer in operative position is adapted to cushion all parts of the device from the reaction of the blows of the hammer, all rearward kicks from the hammer strokes being absorbed by the air cushion.

A further object is to provide a support of this character having an improved construction of air supply and controlling valve and means for operating and holding the same in operative position.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a top plan view, partly in section, of a pneumatic hammer support constructed and arranged in accordance with the invention and showing a hammer engaged therewith; Fig. 2 is a longitudinal sectional view of the support; Fig. 3 is an enlarged sectional view of the piston and a portion of the piston rod employed in connection with the support; Fig. 4 is a sectional view of the end of the hammer showing the construction of the head and means for attaching the same to the hammer; Fig. 5 is an end view of the hammer head; Figs. 6 and 7 are respectively, detail plan and side views of the cap for closing the end of the valve chamber.

Referring more particularly to the drawings, 1 denotes the support, to one end of which is secured, in any suitable manner, a riveting hammer 2. The hammer 2 may be of any desired construction, the support, however, being designed particularly for use in connection with a hammer operated

by compressed air and in which the same air employed for operating the hammer is utilized for operating the support. The support 1 comprises a tubular cylindrical body portion 3 on one end of which is arranged an interiorly threaded socket 4 with which is connected the inner end of the hammer 2. On the opposite end of the cylindrical body portion 3 of the holder is a reducing cap 5 in which is slidably mounted a piston rod 6, on the outer end of which is formed a threaded socket 7 with which is engaged the threaded inner end of an extension supporting rod 8, the outer end of which is provided with a head 9 adapted to be engaged with any suitable form of stationary support.

On the inner end of the piston rod 6 is arranged a piston head 10 having on its inner end a reduced threaded extension 12 having formed in its outer end an annular recess or socket 13 to receive a nut 14 which is screwed on the reduced threaded end 15 of the piston rod 6. The nut 14 is held against rotation on the threaded end 15 of the piston rod by a locking pin or key 16, which is inserted through alined apertures therein and in the end of the rod as shown. The nut 14 and end of the piston rod 6 are held in rotative engagement with the recess or socket 13 in the threaded extension 12 of the piston head by means of a retaining sleeve 17 which is loosely engaged with the reduced end of the piston rod 6 and is provided in its outer end with an enlarged interiorly threaded socket which is screwed into engagement with the threaded outer surface of the extension 12 of the head 10. The sleeve 17 is locked in threaded engagement with the extension 12 by means of a tapered pin or key 18 which is inserted through alined apertures in the sleeve and extension 12, as shown. By thus connecting the piston head with the end of the piston, said parts may freely turn one on the other. In order to facilitate the independent rotation of these parts, I preferably provide a collar 19 which is arranged on the reduced portion of the piston rod 6 adjacent to the outer end of the sleeve 17, as shown. In the opposing faces of the sleeve 17 and collar 19 is formed a ball race 20 in which is arranged a series of anti-frictional bearing balls 21 to reduce the friction between the sleeve and collar when the hammer is rotated. On the outer side of the head 10



is formed a reduced threaded extension 22 on which is arranged a cup shaped packing 23 which is held in place against the head 10 by a cup-shaped retaining member 24, which is also arranged on the extension 22 and is clamped against the packing 23 by a clamping nut 25 screwed on the extension 22 as shown. The nut 25 is locked against rotation by means of a cotter pin 10 26 which is inserted through aligned apertures formed in the nut and in the extension 22, as shown. In the tubular portion of the holder around the piston rod and between the piston head and the cap 5 is arranged a 15 coil plunger retracting spring 11. In the cap 5 is arranged an air relief port 5' and in the tubular portion 3 of the holder adjacent to the cap 5 is arranged an air relief port 3'. The purpose of these air relief 20 ports will be hereinafter described.

In the tubular portion 3 of the support, adjacent to the hammer end of the same is formed an interiorly threaded air inlet port 27 in which is screwed a nipple 28, said nipple 25 having arranged therein a strainer 29 which is secured in position by a hollow or tubular nut 30. To the nipple is connected an air valve 31 to which is connected an air conducting pipe 32. By means of the valve 31 30 compressed air is admitted to the supporting cylinder in the desired quantity.

In the end of the tubular supporting cylinder 3, between the valve 31 and the hammer connection, is formed a transversely disposed 35 passage 33 in one end of which is arranged a valve casing 34 provided with air discharging ports 35 which communicate with an air passage 36 formed in the support between the tubular portion or chamber thereof and 40 the hammer connecting socket. In the casing 34 is slidably mounted an air controlling valve 37, the stem 38 of which projects upwardly through the reduced upper portion of the passage 33 and out through the opposite side of the holder, as shown. In the reduced 45 portion of the passage 33 and around the valve stem 38 is arranged a coiled retracting spring 39, the pressure of which is exerted to close and hold the valve 37 in 50 closed position, thus cutting off the supply of air to the hammer. The lower end of the valve casing 34 is open and is adapted to be closed by a detachable cap plate 40 which may be of any suitable construction and is 55 here shown as being provided on one side with a curved spring flange 41 which is adapted to be engaged with an annular groove 42 formed in the outer side of the valve casing adjacent to its lower end, as 60 shown. The cap 40 is provided to close the outer end of the valve casing and thus prevent the entrance of dirt therein.

In order to open the valve 37 and to hold the same in an open or operative position, I 65 provide a valve operating lever 43 which is

pivotaly mounted between parallel lugs or flanges 44 formed on one side of the tubular body portion of the holder, as shown. On one end of the lever 43 is formed a finger 45 which is adapted to be loosely engaged with a slot 46 formed in the upper end of the valve stem 38, as shown. On the outer end of the lever 43 is formed a thumb piece 47 by means of which the lever may be readily depressed thereby raising the valve to an operative position, wherein the port or passage of the valve will be brought into alinement with the passages 35 and 36 in the valve casing and outer portion of the support. In order to hold the lever 43 in a depressed or operative position, I provide spring projected detents 48 which are operatively mounted in suitable recesses provided therefor in the lugs 44 on the holder. The detents 48 comprise conical shaped heads 49 and stems 50. 85 One of the detents 48 is arranged in the recess of one of the lugs 44 and the stem of said detent projects through an aperture formed in said lug. The opposite detent is arranged in the inner portion of the recess on the opposite side of the lever 43 and the stem of said detent projects through an aperture in a nut 51 which is screwed into the outer end of the recess to close the same. Coil springs 52 are arranged around the stems of said detents and the pressure of said springs forces the pointed inner ends of the detent heads inwardly toward each other and in position to yieldingly engage depressions 53 formed in the opposite sides of the valve operating lever 43 when the latter is depressed to open the valve. When the pointed ends of the detent heads are thus engaged with the recess in the opposite sides of the lever, the latter will be held down and the valve thus held in open or operative position. When it is desired to close the valve, the lever 43 is pushed upwardly and disengaged from the detents after which the spring 39 will close the valve and cut-off the supply of air from the hammer. 110

The principal use of the hammers used in connection with my improved support is for calking over the ends of stay bolts or rivets and in order to facilitate this operation, I preferably construct the poll or "snap" 54 of the hammer with a bearing surface 55 which is concaved or formed in the shape of the head of a bolt or rivet and said concaved head forming surface 55 is preferably provided with a series of radial recesses 56 so that the projecting portions of the head engaging surface will sink into the bolt or rivet head when the hammer is operated thus facilitating the operation of the upsetting or forming of the head. The poll or "snap" 54 of the hammer is provided with an attaching shank 57 which is engaged with the tubular end of the hammer and is slidably secured therein by means of a key 58 which is 130



inserted through the hammer and in engagement with an elongated recess 59 formed in the side of the shank, as shown in Fig. 4 of the drawings.

5 On the hammer end of the support is preferably arranged a ring 60 having formed thereon an apertured lug 61 with which is adapted to be connected a supporting cord for holding the hammer in position. The  
10 ring 60 is loosely engaged with the end of the support thereby permitting the holder to be freely turned or revolved in the ring.

In the operation of the device, upon placing the riveting hammer in position and  
15 opening the valve 31, air will enter the tubular portion of the holder and overcoming the pressure of the spring 11 will force the piston and piston rod back in the tubular cylinder 3 until the head 9 on the extension  
20 8 engages the fixed support, whereupon the riveting hammer will be held in operative engagement with the end of the bolt or rivet to be headed. With the parts in this position, the lever 43 is depressed thereby opening the valve 37 which will admit the air  
25 from the tube or cylinder 3 to the hammer whereby the poll or snap 54 will be forced into engagement with the end of the stay bolt or rivet to be headed. The hammer is  
30 then rotated back and forth by the operator to head the bolt or rivet against the object through which it passes. The lever 43 is held down and the valve thereby held down by means of the detents 48 as hereinbefore  
35 described. The relief port 5' in the cap 5 releases any air which may be in the rear end of the tube or cylinder 3 when the piston is moved back to an operative position, therein. The air passage 3' also releases the  
40 compressed air when the piston has passed the aperture and said releasing of the air acts as an alarm to warn the operator that the piston has about reached the limit of its stroke and that for further space or in-  
45 crease in the distance between the rivet or bolt head and the fixed support, it would be necessary to remove the holding extension 8 and replace the same by a longer extension. It should be noted that while holding ex-  
50 tensions 8 of various lengths may be employed to suit various conditions, the length of the cylinder 3 will permit of considerable variation in the distance between the fixed support and the operating end of the ham-  
55 mer.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the in-  
60 vention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion

and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended 65 claims.

Having thus described my invention, what I claim is:

1. In a pneumatic support for hammers, a tubular cylinder a piston arranged in said 70 cylinder, a piston rod connected to said piston, a holding extension, connected with the outer end of said piston rod, means whereby compressed air is admitted to said cylinder to operate said piston and holding extension, 75 a hammer comprising a tubular sleeve secured to the opposite end of said cylinder, a valve to control the passage of the compressed air from the cylinder to the hammer sleeve and manually-operated means to 80 move said valve into open position.

2. In a pneumatic support of the character described, a tubular cylinder, a piston and piston rod operatively mounted in said cylinder, a holding extension secured to the 85 outer end of said piston rod, a compressed air valve connected to said cylinder, whereby compressed air is admitted thereto to operate said piston, a pneumatic hammer connected to one end of said cylinder, a spring 90 retracted valve arranged in said cylinder to admit air therefrom to said hammer, a valve operating lever, and spring actuated detents adapted to automatically engage said lever to hold the valve in open position. 95

3. In a pneumatic support for hammers, a cylinder, a piston and piston rod operatively mounted in said cylinder, said piston comprising a head having on one end a tubular threaded extension, a cup shaped packing 100 arranged on the opposite end of said head, a cup shaped retaining member to hold said packing in place, a nut arranged on the end of said piston rod to engage the tubular threaded extension on said piston head, an 105 attaching sleeve to revolvably connect said piston head with the end of the piston rod, a collar on said end of the rod, anti-frictional engagement between said sleeve and collar, a holding extension secured to the 110 outer end of said piston rod, means whereby compressed air is admitted to the cylinder to retract said piston and piston rod against the pressure of said spring.

In testimony whereof I have hereunto set 115 my hand in presence of two subscribing witnesses.

HARRY NEVILLE.

Witnesses:

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