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SHOCK ABSORBING SUPPORT FOR PNEUMATIC HAMMERS.

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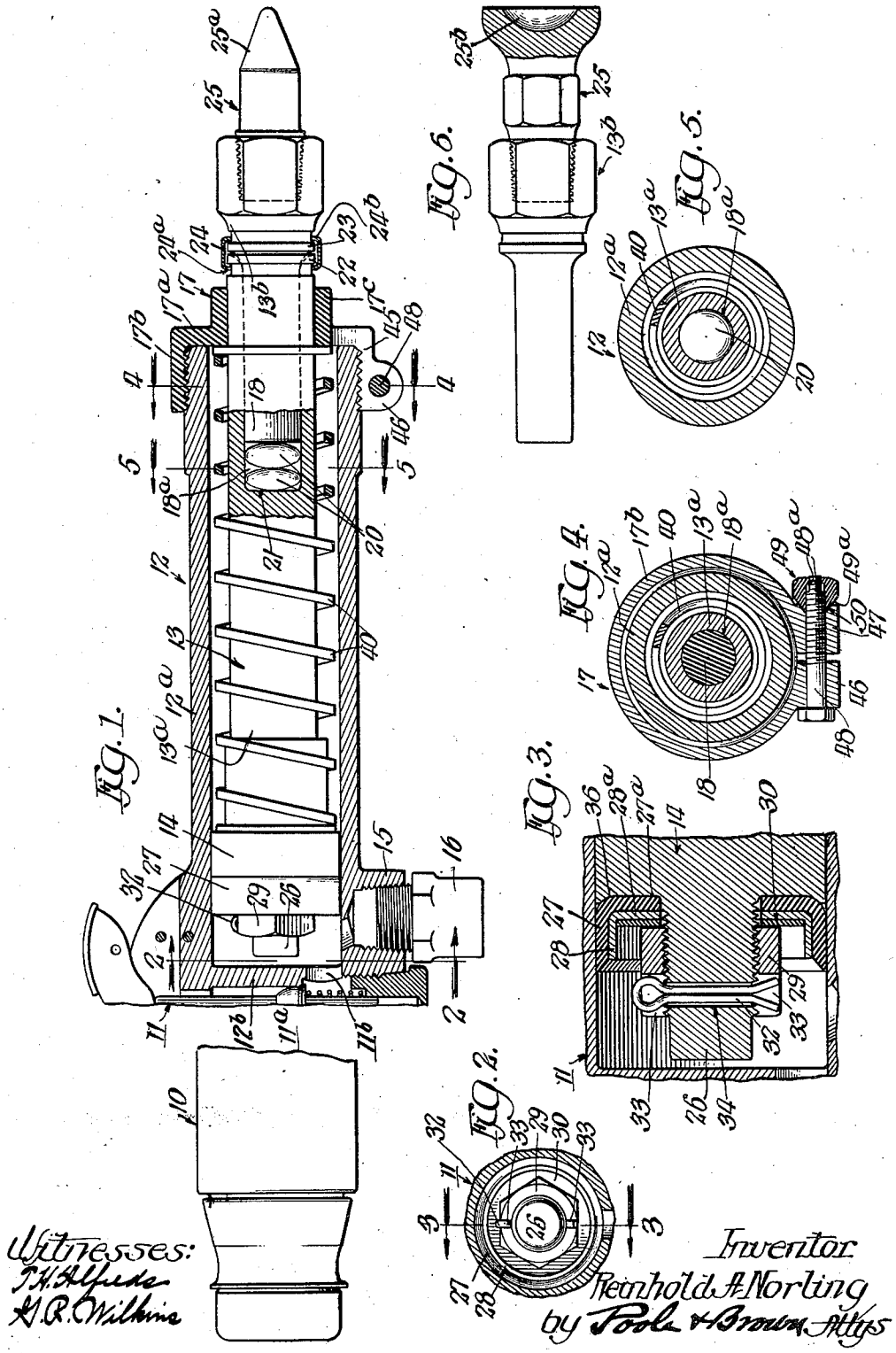
1,043,457. Patented Nov. 5, 1912.



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UNITED STATES PATENT OFFICE.

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SHOCK-ABSORBING SUPPORT FOR PNEUMATIC HAMMERS.

1,043,457. Specification of Letters Patent. Patented Nov. 5, 1912.

Application filed March 24, 1911. Serial No. 616,725.

To all whom it may concern:

Be it known that I, REINHOLD A. NORLING, a citizen of the United States, and a resident of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Shock-Absorbing Supports for Pneumatic Hammers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in supports for pneumatic hammers. Said supports are of the same type as that illustrated and described in Letters Patent No. 958,669, granted May 17, 1910, to H. Neville, and embrace a pneumatic cushion member secured to the head of the hammer and adapted to hold the hammer in proper position during its operation, and at the same time to provide an air cushion for the absorption of the rearward jars or kicks due to the reaction of the blows delivered by the hammer.

The invention relates more particularly to certain novel features of construction whereby the strength and efficiency of the support are greatly increased and consist of the matters hereinafter described and more particularly pointed out in the appended claims.

In the drawings—Figure 1 is a view representing a longitudinal central section through the support and a part of the pneumatic hammer to which it is attached; Fig. 2 is a view representing a transverse section through the forward end of the support on the line 2—2 of Fig. 1; Fig. 3 is a view representing a section in a plane indicated by the line 3—3 of Fig. 2, said section being on an enlarged scale; Figs. 4 and 5 are views representing different transverse sections through the barrel in planes indicated respectively by the lines 4—4 and 5—5 of Fig. 1. Fig. 6 is a view representing a side elevation of the rear member of the plunger showing an extension supporting device with a form of head different from that shown in Fig. 1.

In the drawings, 10 indicates the hammer, 11, the head of the hammer and 12, the shock absorbing support as a whole. 12^a is the barrel of said support in which is reciprocably mounted a piston rod 13 and a piston 14. The barrel 12^a is preferably made integral with the hammer head 11. In said head is located the familiar throttle valve 11^a which controls the supply of air to the hammer, said valve being supplied with air through a passage or opening 11^b in the end wall 12^b of the barrel of the support. The barrel 12^a is provided near its rear end with a laterally extending, apertured boss 15, into which is screwed a nipple 16 which provides means for the attachment of a hose or pipe leading from a source of compressed air supply (not shown) and containing the usual hand-controlled valve by means of which live air is admitted into the barrel 12^a.

The piston rod 13 projects beyond the rear end of the barrel which is closed by means of a reducing cap 17 having a central aperture in which said piston rod has bearing. The piston rod is made in two parts and comprises a forward member 13^a made rigid with the piston-head 14 and a rear end member 13^b, which is rotatively connected to the first-named member. As shown herein, the piston rod member 13^a has a longitudinal central bore 18^a which provides a bearing for the reduced forward end 18 of the member 13^b. Convex disks 20, 20 are interposed between the forward end of the member 13^b and the end wall 21 of said bore to provide an antifriction thrust bearing between the two parts of the piston rod.

22, 23 indicate adjacent flanges formed respectively on the piston rod members 13^a and 13^b and 24 is an elastic clip made of spring metal and having flanges 24^a, 24^b which engage the flanges 22 and 23 respectively on opposite sides and hold the two parts of the piston rod members together.

To the rear end of the piston rod member 13^b is secured a movable head 25. Said head may have either a point 25^a, as shown in Fig. 1, adapted to engage in a hole or opening in line with the rivet or bolt that is being operated upon by the hammer or a recess 25^b, as shown in Fig. 6, adapted to engage the head of a rivet or bolt in line therewith, said head in either case acting to engage with some fixed device and acting to hold the rear end of the support in alinement with the work.

Referring now to the packing for the piston: 26 indicates a forwardly-projecting, centrally located, threaded stem made rigid

with the piston head 14. 27 indicates a cup-shaped packing member made of leather or other suitable material having the base 27ª of the cup bearing against the front face of the piston head and its side walls engaged against the inner surface of the barrel 12ª. The base of said cup has a central aperture through which the stem 26 projects. A metallic cup 28 fits within the leather cup 27 and acts to hold the said leather cup in proper engagement with the inner surface of the barrel. The base 28ª of said metal cup has a centrally located aperture through which the stem 26 extends and said base is held in clamping engagement against the base of the leather cup by means of a nut 29 between which and the base of said metal cup is interposed a flat washer 30 against which said nut directly acts. After said nut is tightened against the washer 30, it is locked in place by means of a cotter pin 32 which extends through slots 33, 33 in the outer end of said nut and a transverse aperture 34 in the stem 26.

The base of the leather cup 27 rests in a recess 36 formed on the front face of the piston head and forming with the inner wall of the barrel a rounded corner for the reception of the rounded edge of the cup base. This construction provides a support which prevents the flange of the cup from bending at a sharp angle to the base thereof and thus in the operation of the piston cracking or breaking the leather.

40 indicates a coiled spring interposed between the piston head and the reducing cap 17, and acting to normally hold the piston at the forward limit of its movement. Said spring acts in opposition to the pressure of the live air entering the forward end of the barrel 12ª of the support when the controlling valve admitting live air to said barrel is opened.

As shown in the drawings, the reducing cap is secured to the rear end of the barrel of the support as follows: Said reducing cap comprises an apertured plate 17ª which engages against the rear end of the barrel 12ª; an outer, internally threaded flange 17ᵇ embracing the end of said barrel and engaged with a thread formed thereon; and a centrally disposed flange 17ᶜ within which the piston 13 has bearing. The plate 17ª and the larger flange 17ᵇ are split to provide a longitudinally extending recess 45 at each side of which are formed ears 46, 47. Said ears are provided with transverse apertures in which is located a clamping bolt 48. 49 indicates a nut screwed upon the threaded end of said bolt and said nut has a conical base 49ª fitting within a conical recess 50 in the outer face of the ear 47. The threaded end of the bolt has flattened sides 48ª and after the nut has been screwed home into the said recess the thread of the nut near its outer end is swaged inwardly to engage the flattened sides 48ª of the end of the bolt. Efficient and simple means are thus afforded for drawing the flange 17ᵇ of the reducing cap into rigid engagement with the barrel and for locking the clamping nut in position.

The operation of the shock absorbing support is familiar and will be apparent from the above description.

When live air is admitted into the front end of the barrel of the support the piston is caused to move rearwardly against the action of the spring 40 until the head 25 is brought into supporting engagement with a hole or rivet-head over against the rivet or bolt that is to be operated upon by the hammer. The live air in the barrel acts as a pneumatic cushion to absorb the successive shocks due to the reactions of the hammer. By reason of the rotative connection of the two piston members, the hammer may be rotated without rotating the supporting head which is rigidly engaged against the hole or rivet-head which supports it.

I claim as my invention—

1. A shock absorbing support for a hammer embracing a cylinder, a piston and piston rod reciprocally mounted in said cylinder, means for supplying live air at the forward end of said cylinder to act upon said piston, and yielding means adapted for normally holding said piston at its forward limit of movement, said piston rod projecting beyond the rear end of said cylinder and comprising two parts, the one part being made rigid with the piston head and being provided at its rear end with a longitudinal, central bore, and the other part having a reduced end rotatively mounted within said bore, means for locking said parts against longitudinal separation, and anti-friction end thrust devices located in said bore and engaged by the reduced end of said second-named piston rod member.

2. A shock absorbing support for a hammer embracing a cylinder, a piston and piston rod reciprocally mounted in said cylinder, means for supplying live air at the forward end of said cylinder to act upon said piston, and yielding means adapted for normally holding said piston at its forward limit of movement, said piston rod projecting beyond the rear end of said cylinder and comprising two parts, the one part being made rigid with the head and being provided at its rear end with a longitudinal, central bore, and the other part having a reduced end rotatively mounted within said bore, means for locking said parts against longitudinal separation and convex anti-friction disks having rounded edges mounted within the bore and engaged by the reduced end of said second-named piston rod member.

3. A shock absorbing support for a pneu-

matic hammer embracing a cylinder extending rearwardly from the head of said hammer in line therewith, a piston rod and piston reciprocably mounted in said cylinder and a reducing cap rigidly secured to the rear end of said cylinder, and having an aperture providing a bearing for said piston rod, means for rigidly securing said cap to said cylinder embracing an internally threaded split flange adapted to embrace the end of said cylinder, the end of said cylinder having a thread which is engaged by the thread of said flange, laterally extending ears or lugs at each side of the split in said cap, said lugs being provided with transverse apertures, a bolt located in said apertures having a head engaged against the outer face of one of said ears, a nut threaded upon the other end of said bolt and engaging the outer face of the other ear, said nut being provided with a conical base engaging within a conical recess within the adjacent face of the associated ear, and the threaded end of said bolt having flattened sides against which the thread of the nut is swaged to lock the same in position.

In testimony, that I, claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 16th day of March, A. D. 1911.

REINHOLD A. NORLING.

Witnesses:
OSCAR CARLGREN,
LESTER J. YOUNG.