May 12, 1931. H. A. STEVENS 1,804,712

PNEUMATIC HAMMER

Filed Aug. 4, 1930

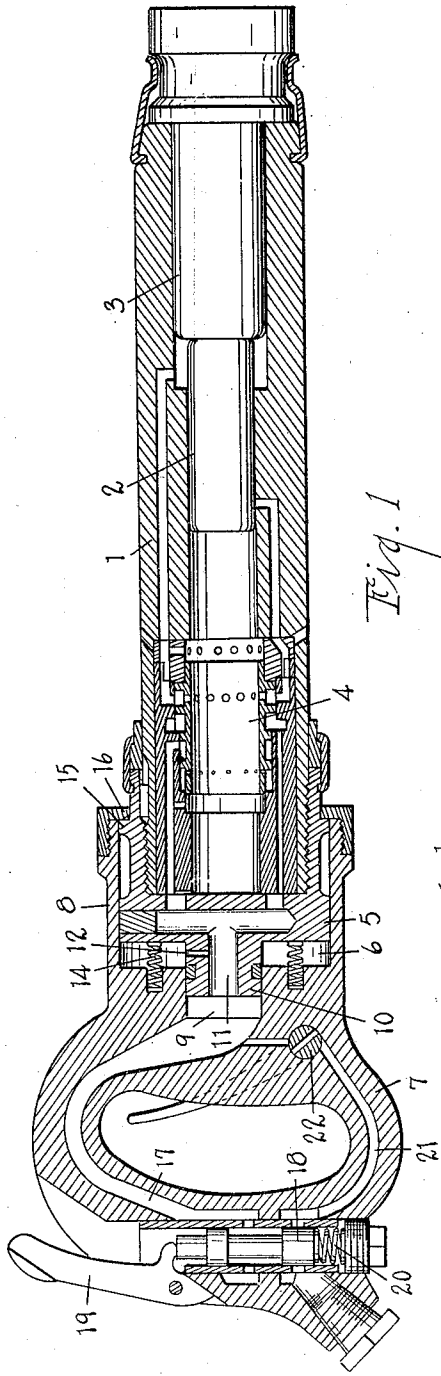


Fig. 1

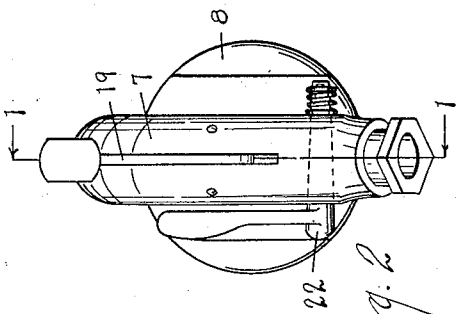


Fig. 2

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PNEUMATIC HAMMER

Application filed August 4, 1930. Serial No. 472,830.

The main object of this invention is to provide a pneumatic tool such as a hammer in which the shock or vibration on the handle is minimized.

A further object is to provide a structure having these advantages which may be readily embodied in pneumatic hammers of certain types now largely used at relatively small cost.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of my invention is clearly illustrated in the accompanying drawings in which:

Fig. 1 is a longitudinal sectional section of a pneumatic hammer embodying the features of my invention on a line corresponding to line 1—1 of Fig. 2, certain parts being shown in full lines for convenience in illustration.

Fig. 2 is an end view from the left of Fig. 1.

Referring to the drawings, the cylinder 1 is provided with a plunger 2 and hammer or impact member 3. The valve 4 controls the inlet and exhaust passages to the cylinder, but, as the details of these passages and the valve form no part of this invention and suitable structures as to these features are well known to those skilled in the art to which this invention relates, I do not give a detailed description thereof.

The cylinder is provided with a head 5 which is reciprocatingly mounted in the cylinder-like cushion chamber 6 of the handle 7. This cushion chamber is formed in the shank 8 of the handle. The handle is also provided with a bore 9 in which the reduced extension 10 on the cylinder reciprocates.

The cylinder has an inlet passage 11 which is in communication with the cushioning chamber 6 through a port 12 opening to the inlet passage 11. The extension 10 is provided with a packing ring 13 disposed in advance of the port 12.

Coiled springs 14 are arranged within the cushion member and act to urge the cylinder outwardly in the cushion member as shown in Fig. 1 with the annular rib 15 of the cylinder in engagement with the flange retaining sleeve 16 which is threaded upon the handle.

The handle is provided with a supply passage 17 having plunger control valve 18 therein, a trigger 19 being provided for opening this valve and the valve being closed by the spring 20. This trigger is positioned so that it may be easily engaged by the hand grasping the handle.

The handle is also provided with a by-pass passage 21 which opens to the supply passage in advance of the valve 18 and also at the rear of this main valve. This auxiliary or by-pass passage is provided with a manually controlled valve 22 which is operated independently of the valve 19. By opening the valve 22 prior to the opening of the valve 19 a sufficient quantity of air is admitted to the cushioning chamber so that, when the main valve is turned on or opened, the recoil of the cylinder is effectively cushioned, and this condition remains during the operation of the tool. It is unnecessary to hold the valve 22 open after the main valve is opened.

My improvements result in minimizing vibration and shock on the handle, which is a feature of very great advantage, relieving the operator of much fatigue and strain resulting from the use of the hammer without this feature. The springs are of sufficient tension to return the cylinder to the position shown in Fig. 1 and yieldingly hold it in that position, the purpose being to insure that the cushioning chamber is always capable of receiving a quantity of air in starting the tool.

I have illustrated and described my improvements in a practical embodiment. I have not attempted to illustrate or describe other embodiments or adaptations, or to illustrate particular automatic valve mechanism, as it is believed that this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a pneumatic tool, the combination with a cylinder and coacting plunger, the cylinder being provided with a head having

a central reduced extension with a longitudinal inlet passage therein, of a handle provided with a cushioning chamber in which said head is reciprocatingly mounted and a bore to receive said head extension, said head extension having a port opening to said cushioning chamber at the rear of said head and being provided with a packing ring disposed in advance of said port, said handle also having an air supply passage therein communicating with said inlet passage of said cylinder and provided with a tool control valve, and a by-pass passage opening to said air supply passage in advance of said tool control valve and communicating with said cushioning member through said port in said inlet passage, a manually controlled valve for said by-pass passage, and springs acting to urge said cylinder outwardly in said cushioning member.

2. In a pneumatic tool, the combination with a cylinder and coacting plunger, the cylinder being provided with a head having a central reduced extension with a longitudinal inlet passage therein, of a handle provided with a cushioning chamber in which said head is reciprocatingly mounted and a bore to receive said head extension, said head extension having a port opening to said cushioning chamber at the rear of said head, said handle also having an air supply passage therein communicating with said inlet passage of said cylinder and provided with a tool control valve, and a by-pass passage opening to said air supply passage in advance of said tool control valve and communicating with said cushioning member through said port in said inlet passage, and a manually controlled valve for said by-pass passage.

3. In a pneumatic tool, the combination of a cylinder and coacting plunger, the cylinder being provided with a head having an inlet passage therein, a handle provided with a cushioning member in which said head is reciprocatingly mounted, said handle also having an air supply passage therein communicating with said inlet passage of said cylinder and provided with a control valve, a by-pass for said control valve provided with a valve operated independently of the control valve, and a spring acting to urge said cylinder outwardly in said cushioning member.

4. In a pneumatic tool, the combination of a cylinder and coacting plunger, the cylinder being provided with a head having an inlet passage therein, a handle provided with a cushioning member in which said head is reciprocatingly mounted, said handle also having an air supply passage therein communicating with said inlet passage of said cylinder and provided with a control valve, and a by-pass for said control valve provided with a valve operated independently of the control valve.

5. In a pneumatic tool, the combination of a cylinder and coacting plunger, the cylinder being provided with a head having an inlet therein, a handle provided with a cushioning chamber in which said head is reciprocatingly mounted, said cylinder inlet being in communication with said cushioning member, a control valve for said inlet passage, and a valved by-pass for said control valve.

6. In a pneumatic tool, the combination of a cylinder and coacting plunger, the cylinder being provided with a head, a handle provided with a cushioning chamber in which said head is reciprocatingly mounted, said cylinder being provided with a valved inlet in communication with said cushioning chamber at the rear of the valve, and means for admitting air to said cushioning chamber prior to the opening of the main valve.

In witness whereof I have hereunto set my hand.

HERMAN A. STEVENS.