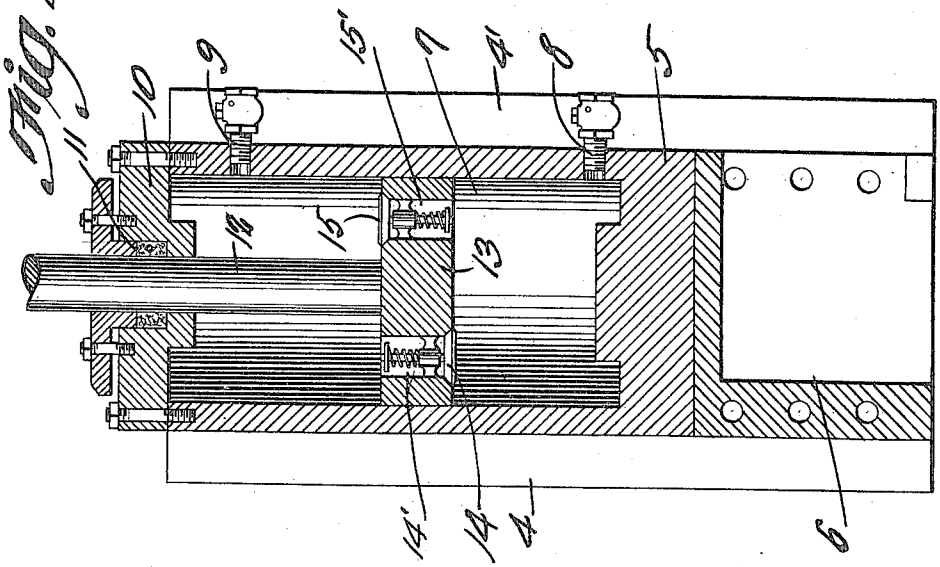
J. B. FRENCH.

CUSHIONING PISTON FOR POWER HAMMERS OR THE LIKE.

APPLICATION FILED MAR. 31, 1913.

1,145,983. Patented July 13, 1915.

Fig. 2.



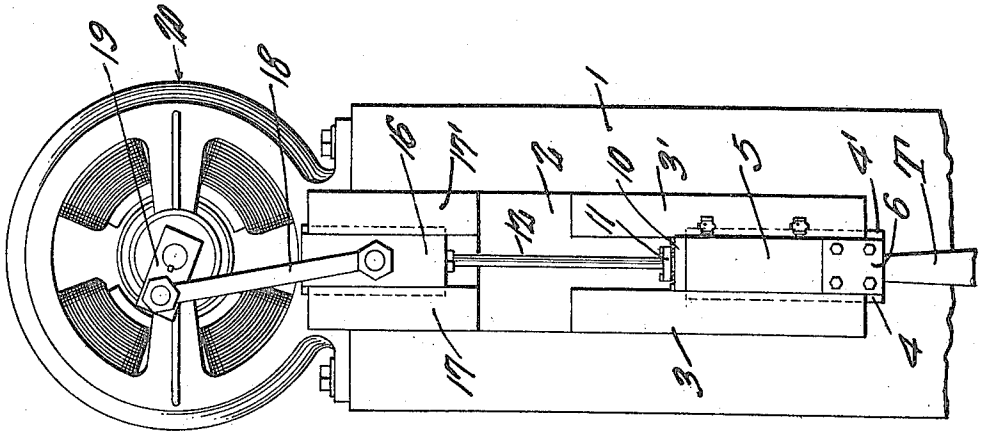


Fig. 1.

Witnesses

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JAMES B. FRENCH, OF CARTHAGE, MISSOURI.

CUSHIONING-PISTON FOR POWER-HAMMERS OR THE LIKE.

1,145,983. Specification of Letters Patent. Patented July 13, 1915.

Application filed March 31, 1913. Serial No. 757,987.

To all whom it may concern:

Be it known that I, JAMES B. FRENCH, a citizen of the United States, residing at Carthage, in the county of Jasper and State of Missouri, have invented a new and useful Cushioning-Piston for Power-Hammers or the like, of which the following is a specification.

The present invention relates to improvements in cushioning pistons for power hammers or the like, one object of the present invention being the provision of a pneumatic connection in a cross head, whereby the tool carried thereby and also the apparatus operating the same is not unduly jarred due to the sudden halt of the same when the tool is brought into contact with a hard material, the present device being especially adapted for use in connection with rock drills, channeling machines, power hammers and the like.

A further object of the present invention is the provision of a cross head connection in which a cylinder is employed having disposed therein a piston, whereby the energy is stored up during the greater part of the stroke and is exploded suddenly at the end of the stroke and also whereby the air compressed within the cylinder provides a cushioning and connecting medium, within the cross head, to relieve the jar upon the prime mover or the tool operated through the cross head.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings, Figure 1 is a side elevation of the present invention showing the same applied in connection with an electric motor as its prime motor. Fig. 2 is a vertical central sectional view through the complete connection, the piston being in intermediate position.

Referring to the drawings, the numeral 1 designates the main support, which has mounted thereupon the vertically disposed plate 2, which may be taken indicative of the main carrying portion of a channeling machine or power hammer, the lower portion of the same being provided with the spaced guides 3—3′, for the reception of the oppositely disposed wings or flanges 4—4′ of the cross-head connection 5. This cross-head connection 5, as clearly shown in Fig. 2, is provided with the tool receiving portion 6 by means of which the tool T may be properly clamped in position to be reciprocated with the cross-head member 5, through the mechanism, as will later appear.

The cross head is provided with the cylindrical portion 7, having disposed at its respective lower and upper ends, the check valve controlled inlets 8 and 9, its upper end being sealed by the disk head 10 and carrying the stuffing box 11 for the proper reception of the connecting or piston rod 12. Upon the lower end of the piston rod 12, within the chamber 7, is the piston head 13, which is provided with the two oppositely disposed and spring closed valves 14 and 15, which control the respective ports 14′ and 15′ of the piston 13.

As shown in Fig. 1, the rod 12 is connected to the connecting plate 16, which is mounted for vertical reciprocatory movement in the guides 17—17′ which are also carried by the plate 2.

A pitman 18 is pivotally connected to the member 16 and to the crank 19 of the electric motor 20, which may be any form of prime mover that will impart the necessary reciprocation through the piston 13 and the compressed air within the cylinder 7 to the tool T.

The valves 8 and 9 may be dispensed with, so that the cylinder 7 will practically be a sealed cylinder, but in some cases it is advisable to provide a compensating means for the loss of air due to leakage and the compression of the piston 13, and for that purpose the check valves 8 and 9 are employed.

The valves 14 and 15, are to have their springs so adjusted as to permit of the proper compression of the air upon the respective sides of the piston 13, and when the air has reached a certain compression, it will be relieved. As for instance assuming that the piston 13 is moving downwardly, as shown in Fig. 2, and has reached its highest point of compression, the air compressed upon the lower side thereof will cause the opening of the valve 15 and consequently relieve the pressure in the lower end of the cylinder so that the piston 13 will be permitted unrestricted movement, the valve 14

operating in a similar manner when the piston is moved in an opposite direction. By this means it will be seen that a cushioning action is imparted through the connection of the piston 13 and chamber 7 to the cross-head 5, so that a pneumatically cushioned connection or cross-head is provided between the tool T and consequently the prime mover 20.

What is claimed is:

A device of this character, including a main support, the lower portion of which is provided with a pair of spaced guides, a cylindrical member having diametrically disposed wings disposed between the guides, with the wings interlocking therewith for straight line movement, said cylindrical member being counter-bored from one end, a cap connected to the open end thereof to seal the same, a stuffing box carried by said cap, a piston rod mounted for reciprocation through the stuffing box into the cylindrical bore, a piston head connected to the inner end of said piston rod within the cylindrical bore, said piston head being provided with a plurality of ports therethrough, one of said ports being provided with a valve seat at one face of the head while the other of said ports is provided with a valve seat at the other face, and a plurality of spring closed valves one to each valve seat for controlling the respective ports.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES B. FRENCH.

Witnesses:
R. P. BAIRD,
JAS. LOGAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."