(No Model.)

J. G. CARLINET.

PNEUMATIC TOOL.

No. 532,311. Patented Jan. 8, 1895.

Fig. 1.

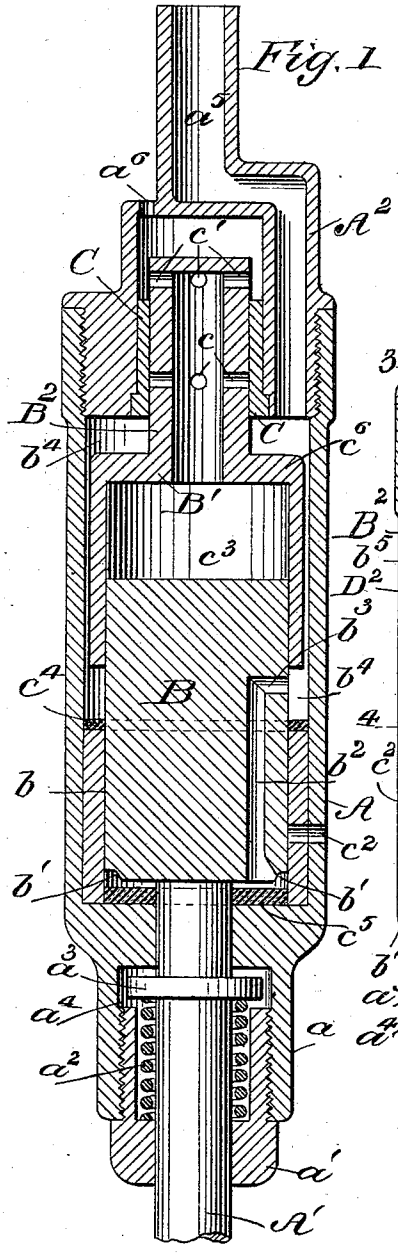


Fig. 2.

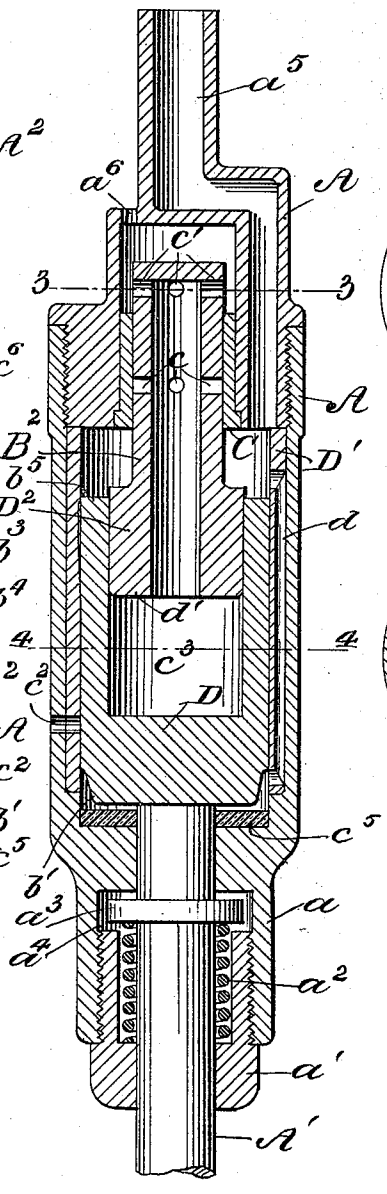


Fig. 3.

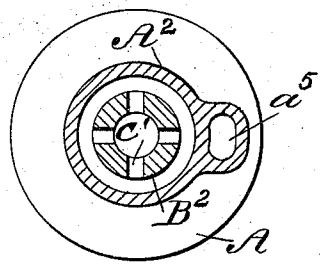
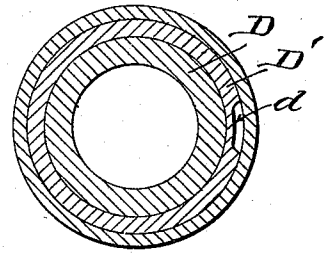


Fig. 4.



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PNEUMATIC TOOL.

SPECIFICATION forming part of Letters Patent No. 532,311, dated January 8, 1895.

Application filed August 16, 1894. Serial No. 520,462. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. CARLINET, a citizen of the United States, and a resident of Frankford, Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Tools, of which the following is a specification.

This invention relates to devices wherein atmospheric air or other fluid pressure is used for operating a reciprocating tool employed for stone dressing, calking, riveting, dental use, rock drilling, &c., and it consists in the construction and novel arrangement of parts, as hereinafter set forth.

In the accompanying drawings: Figure 1, is a longitudinal section of a tool embodying my invention. Fig. 2, is a longitudinal section showing a modification thereof. Fig. 3, is a transverse section on the line 3, 3, of Fig. 2, and Fig. 4, is a transverse section on the line 4, 4, of Fig. 2.

Referring by reference characters to the drawings, A, designates a shell or casing, having at one end, as herein shown, a reduced portion a, within which a tool holder A′, reciprocates. A tubular nut a', surrounds the tool or tool holder and a spring a^2, abutting at one end against an interior shoulder of the nut and an annular shoulder a^3, on the tool or tool holder serves to retain and to return the tool or tool holder to its inner or normal position after being operated upon by the striker.

It will be seen that the tool or tool holder has a very short movement limited by the walls of an annular chamber a^4, within which the shoulder a^3, is arranged. The opposite end of the casing A, is provided with a cap A^2, having the pressure supply duct a^5, and an exhaust port a^6.

In Fig. 1, B, indicates the striker of substantially solid metal, and having a bearing in a reduced portion b, of the casing A. The end of the striker B, adjacent the tool or tool holder, has an annular pressure bearing surface b', and from this surface a duct b^2, leads through the striker and has an opening b^3, into the chamber b^4, of the casing.

B′, designates the distributing valve, having a substantially cup-shaped portion arranged within and of slightly smaller diameter than the chamber b^4, and engaging around the striker B. This valve has a hollow stem portion B^2, communicating with the interior of the main portion of the valve. This stem portion is movable in a packing C, and it is provided with an induction port or ports c, for receiving air from the chamber b^4, and an exhaust port or ports c', communicating with the outlet a^6. The portion B^2, and the closure or packing C, act as the valve proper for the admission and exhaust of the operating current. The casing A, is also provided with an exhaust port or ports c^2, adjacent the end of the striker, and controlled by the movement thereof.

In the operation of the device in Fig. 1, above described, the reciprocations of the striker B, and distributing valve, B′, in opposite directions, are practically simultaneous. Air under constant pressure through the duct a^5, enters the chamber c^3, through the ports c, and acting on the upper surface of the striker drives the same with force against the tool or tool holder, as shown in the drawings. The pressure also prevailing on the greater interior area of the valve B′, reciprocates it until its exhaust ports extend beyond the bushing or valve seat C, where the prevailing body of air is exhausted. When the valve B′, is in its exhaust position the opening b^3, of the port b^2, is uncovered thereby, so that a pressure of air rushes through said port b^2 and bears against the shoulder b', and the bottom of the striker B, and forces it up until its lower end registers with the exhaust port c^2. During this return movement of the striker, and before the exhaust port c^2, has been opened, the air pressure on the external shoulder c^6, of the valve B′, will have moved said valve until the opening b^3, is closed thereby, and the ports c, of said valve are in communication with the chamber b^4, preparatory to another stroke. The valve may have a yielding abutment c^4, and the striker may have a yielding abutment c^5.

Referring now to the example shown in Fig. 2, a striker D, is shown as fitting the casing A, throughout its interior length; a bushing D′, being arranged in said casing for conven-

ience. In this construction a duct d, for the air pressure to operate on the part b', and bottom of the striker, is formed in the shell or in the bushing D'. The striker D, in this example is hollow or substantially cup-shaped, and the enlarged portion d', of a distributing valve D^2, operates therein. The striker D, in this example, serves as a closure for the inlet of the duct d, and thereby directly controls the induction as well as the eduction of fluid at its striking end. A constant pressure at b^5, at the upper end of the striker has to be overcome during its return movement in the example of Fig. 2, but this is wholly obviated in the example of Fig. 1. In other respects the construction and operation are practically similar in Figs. 1 and 2, and in both examples there is no pressure resistance to the striking movement of the striker.

In devices of this character heretofore made, strikers have been constructed of differential diameters, depending for their return movement on a constant pressure at the supplemental area of said striker.

Having described my invention, what I claim is—

1. In a pneumatic tool, the combination with a cylinder having a tool support at one end and a valve casing at the other, of a striker fitted to and guided by said cylinder, and a longitudinally movable distributing valve independent of the cylinder, fitted to and guided by said striker at one end, and by said casing at the other end.

2. In a pneumatic tool, the combination with a cylinder having a tool support at one end and a valve casing at the other, of a striker fitted to and guided for a portion of its length by said cylinder, a distributing valve independent of the cylinder having a cylindrical portion at one end surrounding and guided upon a remaining portion of the length of the striker; said valve guided at its other end by said casing.

3. In a pneumatic tool, the combination of a casing, a movable striker within the casing, means for producing the striking movements of the striker, means for admitting fluid pressure between the striking end of the striker and the tool end of the casing, and means for exhausting pressure at said striking end, consisting in an independent exhaust port controlled by the movements of said striker.

4. In a pneumatic tool, the combination of a casing, a movable striker therein, a distributing valve for controlling the induction and eduction of fluid pressure above the striker, a duct extending through the striker, also controlled by said valve for admitting fluid pressure below the striker, and means for exhausting said fluid below the striker.

Signed at Frankford, Philadelphia, in the county of Philadelphia and State of Pennsylvania, this 5th day of July, A. D. 1894.

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