

L. C. BAYLES.
VALVE FOR PERCUSSIVE TOOLS.
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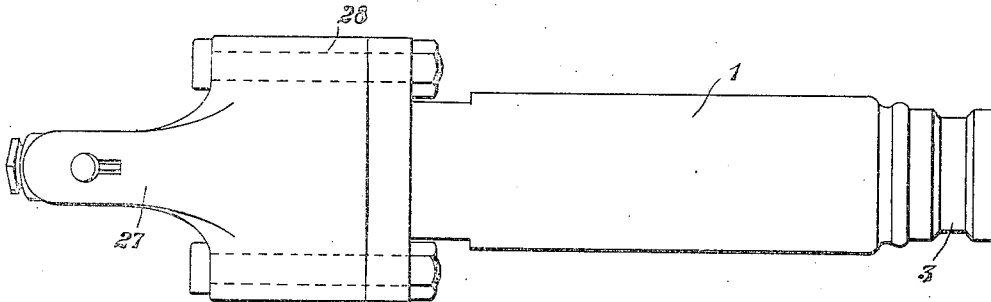


Fig. 1.

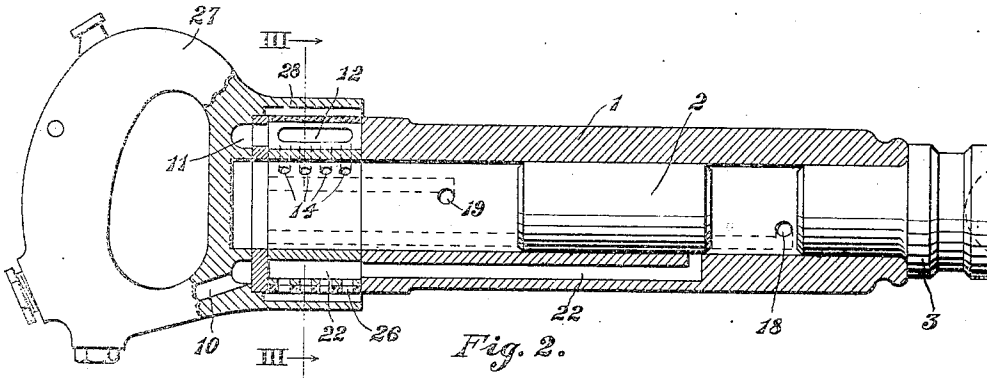


Fig. 2.

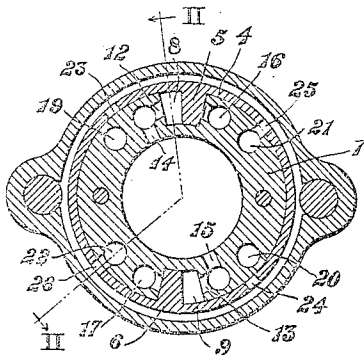


Fig. 3.

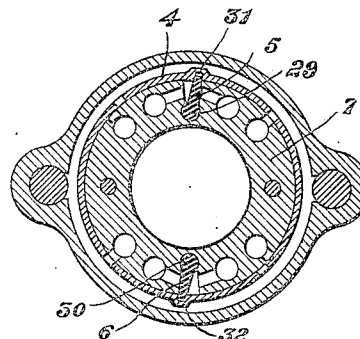


Fig. 4.

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VALVE FOR PERCUSSIVE TOOLS.

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To all whom it may concern:

Be it known that I, LEWIS C. BAYLES, a citizen of the United States, residing in Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Valves for Percussive Tools, of which the following is a specification.

This invention relates to percussive tools and more particularly to a valve for such tools.

The object of this invention is to produce a valve of the oscillating type which can be placed concentrically with the cylinder allowing the piston to move inside of it, the object of such construction being that the length of the cylinder can be materially decreased without the necessity of a cumbersome valve chest on the outside of the cylinder.

A further object is to produce a valve of this type in which all pressures are perfectly balanced, friction being thus reduced to a minimum.

With these and other objects in view which will further appear I have devised a valve a practical embodiment of which is shown in the accompanying drawings in which,

Figure 1 is a plan view of the tool Fig. 2 is a longitudinal section through the tool taken on the line II—II of Fig. 3 Fig. 3 is a transverse section through the valve taken on the line III—III of Fig. 2 and Fig. 4 is a section similar to Fig. 3 showing a modified form of the valve.

In the drawings, the tool as shown is a riveting tool which comprises a cylinder in which reciprocates a piston 2 which actuates by its impact the rivet set 3.

In the form shown in Fig. 3 the valve consists of a ring 4 provided with two internally projecting taper wings 5 and 6. This is adapted to oscillate about a cylindrical valve seat 7 which is provided with diametrically opposite slots 8 and 9 into which the wings 5 and 6 extend and in which the wings 5 and 6 may have a limited oscillatory movement. These slots 8 and 9 are in direct communication with the tool inlet 10 from the annular chamber 11. From the faces of the slots 8 and 9 elongated inlet ports 12 and 13 lead by ports 14 and 15 to opposite sides of the back end of the cylinder. From the opposite faces of the slots 8 and 9 inlet pas-

sages 16 and 17 lead to opposite ports 18 in the front end of the cylinder. To allow the fluid to exhaust from the cylinder two sets of exhaust passages are provided, passages 19 and 20 leading from the back end of the cylinder and passages 21 and 22 leading from the front end of the cylinder. These exhaust passages are so placed as to balance each other and to register alternately with ports 23, 24, 25 and 26 in the valve ring 4, which ports lead to the atmosphere. The handle 27 of the tool is provided with a cylindrical flange 28 which protects the valve ring 4 from external contact.

In operation, supposing the valve to be in the position in Fig. 3, live fluid will enter the tool through the inlet 10 and annular chamber 11 and pass through the slots 8 and 9, and ports 12, 13, 14 and 15 into the rear end of the cylinder driving the piston forward, the air in the forward end of the cylinder exhausting through passages 21 and 22 and ports 25 and 26 to the atmosphere. When the piston covers the opening of passage 22, as shown in Fig. 2, the further forward movement of the piston will create a pressure in the forward end of the cylinder which will be transmitted by ports 18 and passages 16 and 17 to the wings 5 and 6 on the valve throwing the wings 5 and 6 to the opposite side of the valve slots 8 and 9. This will allow live fluid pressure to enter the forward end of the cylinder through passages 16 and 17 and ports 18 driving the piston backward, the valve being again thrown by compression generated in the rear end of the cylinder after the piston has passed the openings of passages 19 and 20.

In Fig. 4 a slightly modified form of the valve is shown in which the wings 5 and 6 instead of being integral with the valve ring 4 have cylindrical bearing portions 29 and 30 which are seated in the valve chest 7 while the other ends of the wing project into grooves 31 and 32 in the valve ring 4 thus communicating their motion to the valve ring.

Each construction results in a valve which is perfectly balanced as to opposing fluid pressures on the valve ring 4 which consequently moves easily and without friction. It is to be understood that the present showing and description discloses only certain specified modifications of my invention and other forms and modifications are in-

cluded in the spirit and scope of the invention as expressed in the claims.

What I claim is:

1. In a percussive tool, a cylinder, its piston, an annular valve seat, an annular valve ring on said valve seat, wings for moving said valve ring, cylinder inlet passages controlled by said wings and cylinder exhaust passages controlled by said annular valve ring.

2. In a percussive tool, a cylinder, its piston, an annular valve seat, an annular valve ring on said valve seat, a plurality of wings for moving said valve ring, and evenly spaced therearound, cylinder inlet passages controlled by said wings and balanced cylinder exhaust passages controlled by said annular valve ring.

3. In a percussive tool, a cylinder, a piston, an annular valve seat surrounding said cylinder, an annular valve ring on said valve seat, wings for moving said valve ring, and cylinder inlet passages controlled by said wings, said cylinder inlet passages serving to convey fluid pressure to oscillate said wings.

4. In a percussive tool, a cylinder, its piston, an annular valve seat having slots therein, a valve ring rotatably seated on said

annular seat and having ports therein, exhaust passages leading from the cylinder and having openings to a face of said valve ring, said openings being so placed as to alternately register with said ring ports, cylinder inlet passages opening to the faces of said slots and wings positioned to oscillate in said slots, said wings engaging said valve ring.

5. In a percussive tool, a cylinder, its piston, an annular valve seat surrounding said cylinder and having slots therein, a valve ring rotatably seated on said annular seat and having two sets of oppositely placed ports therein leading to the atmosphere, two exhaust passages leading from each end of the cylinder having openings so placed as to alternately register with the ports in said valve ring, wings in said slots engaging said valve ring and positioned to oscillate between the faces of said slots and inlet ports in the faces of said slots leading to the ends of the cylinder, and serving to introduce fluid to the cylinder, and lead fluid to said wings to oscillate the same.

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