

L. C. BAYLES.
VALVE MOTION FOR PERCUSSIVE TOOLS.
APPLICATION FILED SEPT. 18, 1911.

1,057,700.

Patented Apr. 1, 1913.

Fig. 1.

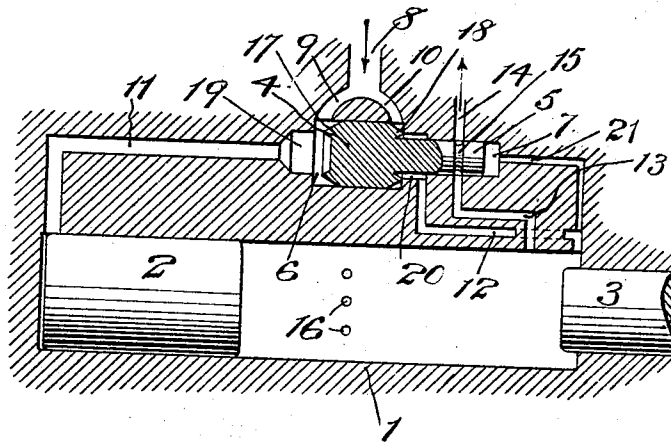
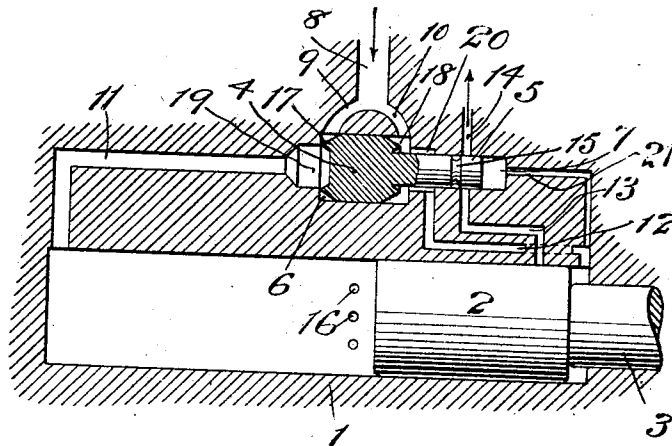


Fig. 2.



Witnesses:

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Inventor:

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by his attorney
Brown & ...

UNITED STATES PATENT OFFICE.

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VALVE-MOTION FOR PERCUSSIVE TOOLS.

1,057,700.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed September 18, 1911. Serial No. 649,947.

To all whom it may concern:

Be it known that I, LEWIS C. BAYLES, a citizen of the United States, and resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Valve-Motions for Percussive Tools, of which the following is a specification.

This invention relates to a valve motion for motive fluid operated percussive tools, and has for its object to provide certain improvements in the construction, form and operation of the valve mechanism whereby a valve may be employed which is very simple in construction, rapid in operation and positive in action.

This invention is more particularly directed to a reciprocating valve having a head and stem, the head being arranged to control the inlet ports for both ends of the cylinder and the stem being arranged to control the exhaust port for one end of the cylinder, as for instance, the front end thereof.

A practical embodiment of the invention is represented in the accompanying drawings in which,

Figure 1 is a diagrammatic section through a motive fluid operated percussive tool of the piston hammer type, the parts being in the positions which they assume when the inlet port for the back end of the cylinder is opened to the motive fluid supply, the inlet port for the front end of the cylinder being closed and the exhaust port for the front end of the cylinder being opened to external atmosphere. Fig. 2 is a similar view with the parts in the positions which they assume when the inlet port for the front end of the cylinder is opened to the motive fluid supply, the inlet port for the back end of the cylinder being closed and the exhaust port for the front end of the cylinder being closed.

In the accompanying drawings the percussive tool is shown as a riveting hammer, the cylinder being denoted by 1, the piston hammer by 2 and the riveting set which projects into the front end of the piston chamber, by 3. The valve which controls the operation of the tool has a head 4 fitted to slide in the chamber 6 of the valve chest and a stem 5 fitted to slide in the chamber 7 of the valve chest. A motive fluid supply passage 8 is provided with restricted branch

passages 9, 10, leading to the opposite ends of the chamber 6. The back and front inlet ports 11, 12, for the cylinder open into the back and front ends of the chamber 6, opposite the back and front faces of the valve head 4, so that the said ports are opened and closed by a movement of the valve head in a line perpendicular to the surface through which said ports open. The front exhaust port 13 for the cylinder 1, opens into the chamber 7 of the valve chest in position to be opened and closed by the valve stem 5. A continuation 14 of the front exhaust port 13 leads to external atmosphere and the stem 5 is provided with a port 15 which is arranged to open and close the exhaust port as the valve reciprocates. The rear exhaust port 16 for the cylinder 1, opens directly to external atmosphere and in the present instance is so arranged that it will be alternately opened to the opposite sides of the piston hammer 2, as the hammer reciprocates. The opposite ends of the head 4 of the controlling valve are preferably tapered as shown at 17, 18, for facilitating the rapid operation of the valve. The mouth of the back inlet port 11 at the valve chest is preferably enlarged as shown at 19, and the mouth of the front inlet port 12 is also preferably enlarged at the valve chest as shown at 20. A vent 21 leading to the front inlet port 12, is provided for the chamber 7 of the valve chest.

It will be seen from the above description that the reciprocation of the valve will alternately open the mouth of the fluid supply passage 8, through its branches 9, 10, to the back and front inlet ports 11 and 12, and will alternately open and close the front exhaust port 13, the rear exhaust port 16 in the present instance being alternately opened to the opposite sides of the piston hammer 2 as it is reciprocated.

It is to be understood that the front and back exhaust ports may be located at any desired position in the cylinder so as to secure the desired operation of the tool by throwing the controlling valve at an earlier or later moment.

While I have shown this valve mechanism in connection with a riveting tool, it is to be understood that I do not wish to limit myself to this use, but contemplate the use of the valve mechanism wherever applicable in percussive machines and tools.

What I claim is:

1. A cylinder, its piston and a valve having a head arranged to control the admission of fluid to both ends of the cylinder and a stem arranged to control the exhaust from the front end of the cylinder.

2. A cylinder, its piston, inlet and exhaust ports and a valve having a head and stem, the opposite faces of the head being arranged to open and close the inlet ports and the stem being arranged to open and close an exhaust port for the front end of the cylinder.

3. A cylinder having separate inlet and exhaust ports, its piston, and a valve having a head for controlling the inlet ports, and a stem for controlling a front exhaust port.

4. A cylinder having separate inlet and exhaust ports, its piston and a valve having a head for opening and closing the inlet ports by a movement directly toward and away from the mouths of said ports, and a stem for opening and closing a front exhaust port by a sliding movement across the mouth of said port.

5. A cylinder having inlet ports for both of its ends and intermediate exhaust ports, its piston and a valve for controlling the inlet ports and one exhaust port only.

6. A cylinder having inlet ports for both of its ends and intermediate exhaust ports, its piston, and a valve arranged to control the inlet ports and one of the exhaust ports, the other exhaust port opening directly to external atmosphere.

7. A cylinder having inlet ports for both of its ends and intermediate exhaust ports, its piston, and a valve having a head for opening and closing the inlet ports and a stem for opening and closing the front exhaust port.

8. A cylinder having inlet ports for both of its ends and intermediate exhaust ports, its piston, and a valve having a head for opening and closing the inlet ports and a stem for opening and closing one of the exhaust ports, the other exhaust port being open directly to external atmosphere.

9. A cylinder, its piston, a valve chest, a valve therein having a head and stem, front and rear inlet ports for the cylinder leading into the valve chest opposite the faces of the valve head, whereby the movement of the valve alternately opens and closes the inlet ports, and a front exhaust port for the cylinder leading to the valve chest into position to be opened and closed by the valve stem.

10. A cylinder, its piston, a valve chest,

a valve therein having a head and stem, front and rear inlet ports for the cylinder leading into the valve chest opposite the faces of the valve head, whereby the movement of the valve alternately opens and closes the inlet ports and a front exhaust port for the cylinder leading to the valve chest into position to be opened and closed by the valve stem and a rear exhaust port leading directly to external atmosphere.

11. A cylinder, its piston, a valve chest, a valve therein having a head and stem, front and rear inlet ports for the cylinder leading into the valve chest opposite the faces of the valve head, whereby the movement of the valve alternately opens and closes the inlet ports, and a front exhaust port for the cylinder leading to the valve chest into position to be opened and closed by the valve stem and a rear exhaust port leading directly to external atmosphere, said rear exhaust port being located in position to be alternately opened to the front and back sides of the said piston.

12. A cylinder, its piston, a valve chest, a valve therein, front and back inlet ports for the cylinder opening into the valve chest opposite the front and back faces of the valve, a motive fluid supply passage having branches leading therefrom to the opposite ends of the valve chest and intermediate exhaust ports for said cylinder.

13. A cylinder, its piston, a valve chest, a valve therein, front and back inlet ports for the cylinder opening into the valve chest opposite the front and back faces of the valve, a motive fluid supply passage having branches leading therefrom to the opposite ends of the valve chest and intermediate exhaust ports for said cylinder, the exhaust port from the forward end being controlled by the valve.

14. A cylinder, its piston, a valve chest, a valve having a head and a stem, front and back inlet ports for the cylinder opening into the valve chest opposite the front and back faces of the valve head, a motive fluid supply passage having branches leading therefrom to the opposite ends of the valve chest and intermediate exhaust ports for said cylinder, the exhaust port for the forward end being controlled by the valve stem.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this fifth day of September 1911.

LEWIS C. BAYLES.

Witnesses:

F. GEORGE BARRY,
HENRY C. THIENE.