L. C. BAYLES.

PERCUSSIVE TOOL.

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1,080,095.

Patented Dec. 2, 1913.

Fig. 1.

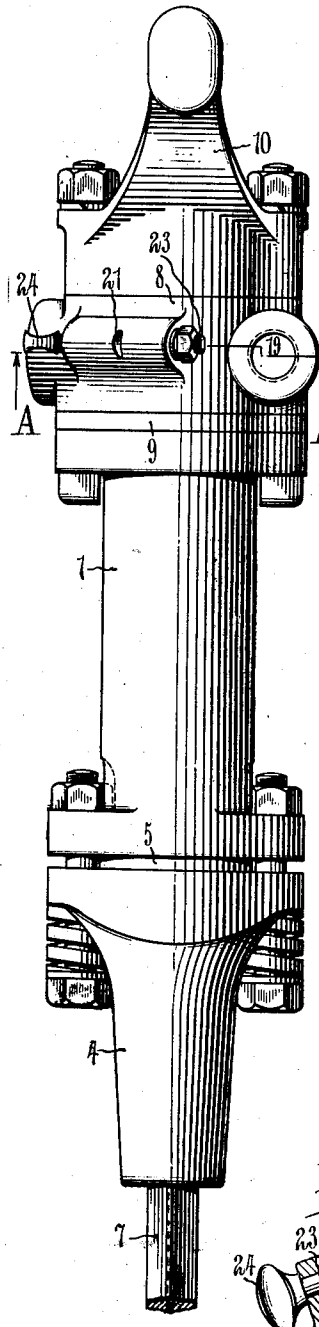


Fig. 4.

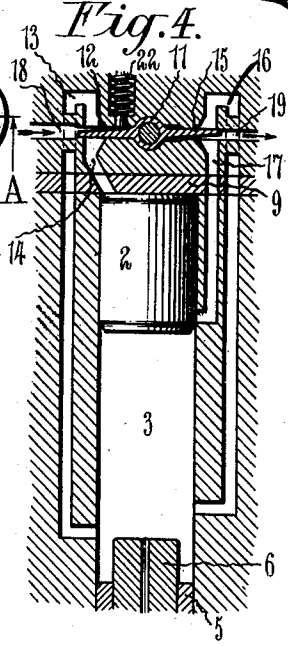
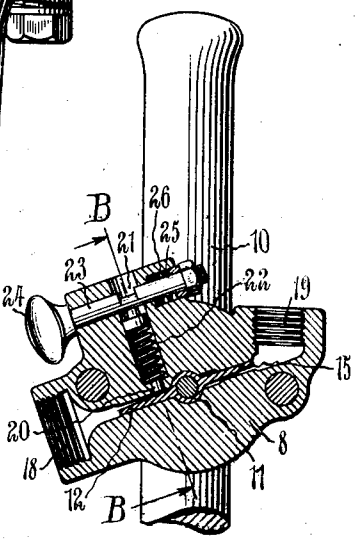


Fig. 3.

Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

LEWIS C. BAYLES, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

PERCUSSIVE TOOL.

1,080,095. Specification of Letters Patent. Patented Dec. 2, 1913.

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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 Percussive Tools, of which the following is a specification.

The object of my invention is to provide means for utilizing the motive fluid for cleaning out a hole being bored, by maintaining the bore of the hollow drill steel in open communication with the motive fluid supply when so desired.

My invention more particularly comprises means under manual control for holding the piston controlling valve in one position, thus stopping the operation of the tool while the motive fluid is used for cleaning out the hole being bored.

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

Figure 1 represents a percussive tool of the piston hammer type in side elevation with my invention applied thereto. Fig. 2 is a transverse section taken in the plane of the line A—A of Fig. 1, and Fig. 3 is a general longitudinal central section through the tool, the controlling valve chest being shown in section in the plane of the line B—B of Fig. 2, and Fig. 4 is a diagrammatic section indicating the motive fluid ports and passages.

The tool cylinder is denoted by 1, the work piston by 2 and its chamber by 3. The front head is denoted by 4 and the front head washer by 5. A hollow anvil block 6 is shown mounted in the washer 5 in position to be struck by the piston 2. A hollow drill steel 7 is shown inserted through the head block in position to be struck by the anvil block 6. The controlling valve chest 8 is interposed between the back head 9 and the handle 10 of the tool, which valve chest is shown herein as containing an oscillating controlling valve 11 of the double winged type, one wing 12 being arranged to control the motive fluid inlet ports 14, 13, for the back and front ends of the piston chamber 3 and the other wing 15 being arranged to control the back and front exhaust ports 17, 16, of the piston chamber 3. The motive fluid supply passage is denoted by 18 and the exhaust passage by 19.

Means under manual control are provided for holding the piston controlling valve 11 in one position when so desired, for instance, in position to close the inlet port for the back end of the piston chamber and the exhaust port for the front end of the piston chamber and open the exhaust port for the back end of the piston chamber and the inlet port for the front end of the piston chamber. The means which I have shown herein for accomplishing this purpose comprises a pin 20, mounted in the valve chest 8, in position to have its inner end brought into and out of engagement with the wing 12 of the controlling valve by a cam 21 and a spring 22. The spring 22 is shown as tending to force the pin 20 outwardly away from the valve wing 12, and into engagement with the cam 21 on the cross shaft 23, which cross shaft is provided with a handle 24 for turning the same. This cross shaft 23 may be provided with means for retaining it in its different positions as for instance, a friction device including a spring 25 located in a recess 26 in the valve chest and engaging the shaft 23.

When it is desired to blow the cuttings out of the hole being bored, the operator may turn the handle 24 and thereby the shaft 23, in a direction to cause the cam 21 to force the pin 20 inwardly against the face of the valve wing 12; thus forcing the valve wing over to a position which will open communication from the motive fluid supply 18 to the bore of the drill steel 7, through the front end of the piston chamber 3 and the bore of the hollow anvil block 6. While the controlling valve is held in this position, the operation of the work piston 2 is stopped and the communication between the motive fluid supply and the bore of the drill steel 7 is maintained. When it is desired to again start the operation of the tool, the handle 24 of the shaft 23, is turned in a direction to permit the pin 20 to move outwardly away from its engagement with the valve ring 12 and thereby permit the valve to continue its oscillations.

It is to be understood that the type of

valve and the form of the manually controlled device shown herein is not essential to the invention, as I contemplate the use of the invention in connection with valves of any type and manually controlled devices of any type for holding the valve in position to produce the result above set forth. It is also evident that the invention is not to be limited to percussive tools of the type shown and described herein, but may be used in connection with tools of any type wherever applicable.

What I claim is:

1. In a percussive tool, a pressure fluid operated distributing oscillating valve and means under manual control for holding the valve in one position.

2. In a percussive tool, a pressure fluid operated distributing oscillating valve and means under manual control for holding the valve in position to stop the operation of the tool.

3. In a percussive tool, a hollow drill steel, a pressure fluid operated distributing valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the drill steel.

4. In a percussive tool, a hollow drill steel, a pressure fluid operated distributing oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the drill steel.

5. In a percussive tool, a hollow drill steel, a pressure fluid operated distributing valve and means under manual control for holding the valve in position to stop the operation of the tool and to maintain communication between the motive fluid supply and the drill steel.

6. In a percussive tool, a hollow drill steel, a pressure fluid operated distributing oscillating valve and means under manual control for holding the valve in position to stop the operation of the tool and to maintain communication between the motive fluid supply and the drill steel.

7. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the piston chamber to stop the operation of the piston.

8. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the piston chamber to stop the operation of the piston.

9. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the front end of the piston chamber to stop the operation of the piston.

10. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the front end of the piston chamber to stop the operation of the piston.

11. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the hollow drill steel through said piston chamber.

12. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the hollow drill steel through said piston chamber.

13. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to stop the operation of the piston and to maintain communication between the motive fluid supply and the hollow drill steel through said piston chamber.

14. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to stop the operation of the piston and to maintain communication between the motive fluid supply and the hollow drill steel through said piston chamber.

15. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the front end of the piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the hollow drill steel through the front end of the piston chamber.

16. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in com-

munication with the front end of the piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the hollow drill steel through the front end of the piston chamber.

17. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the front end of the piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to stop the operation of the piston and to maintain communication between the motive fluid supply and the drill steel through the front end of the piston chamber.

18. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the front end of the piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to stop the operation of the piston and to maintain communication between the motive fluid supply and the drill steel through the front end of the piston chamber.

19. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the piston chamber and at the same time close the exhaust from the same end of said chamber.

20. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the piston chamber and at the same time close the exhaust from the same end of said chamber.

21. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the front end of the piston chamber and at the same time close the exhaust from the front end of said chamber.

22. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the front end of the piston chamber and at the same time close the exhaust from the front end of said chamber.

23. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the front end of the piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the drill steel through the front end of the piston chamber and at the same time close the exhaust from the front end of said chamber.

24. In a percussive tool, a work piston, a piston chamber, a hollow drill steel in communication with the front end of the piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the drill steel through the front end of the piston chamber and at the same time close the exhaust from the front end of said chamber.

25. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the chamber and at the same time close the exhaust for the same end of said chamber and open the exhaust for the other end of said chamber and close communication between the motive fluid supply and the last named end of said chamber.

26. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and one end of the chamber and at the same time close the exhaust for the same end of said chamber and open the exhaust for the other end of said chamber and close communication between the motive fluid supply and the last named end of said chamber.

27. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and the front end of the chamber, close communication between the motive fluid supply and the back end of the chamber and at the same time close the exhaust from the front end of said chamber and open the exhaust from the back end of said chamber.

28. In a percussive tool, a work piston, a piston chamber, a pressure fluid operated piston controlling oscillating valve and means under manual control for holding the valve in position to maintain communication between the motive fluid supply and

the front end of the chamber, close communication between the motive fluid supply and the back end of the chamber and at the same time close the exhaust from the front end of said chamber and open the exhaust from the back end of said chamber.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this tenth day of February 1912.

LEWIS C. BAYLES.

Witnesses:

F. GEORGE BARRY,

C. S. SUNDGREN.