

No. 781,148.

PATENTED JAN. 31, 1905.

W. KENNEDY.  
MOTIVE CYLINDER.  
APPLICATION FILED OCT. 8, 1900.

Fig. 1.

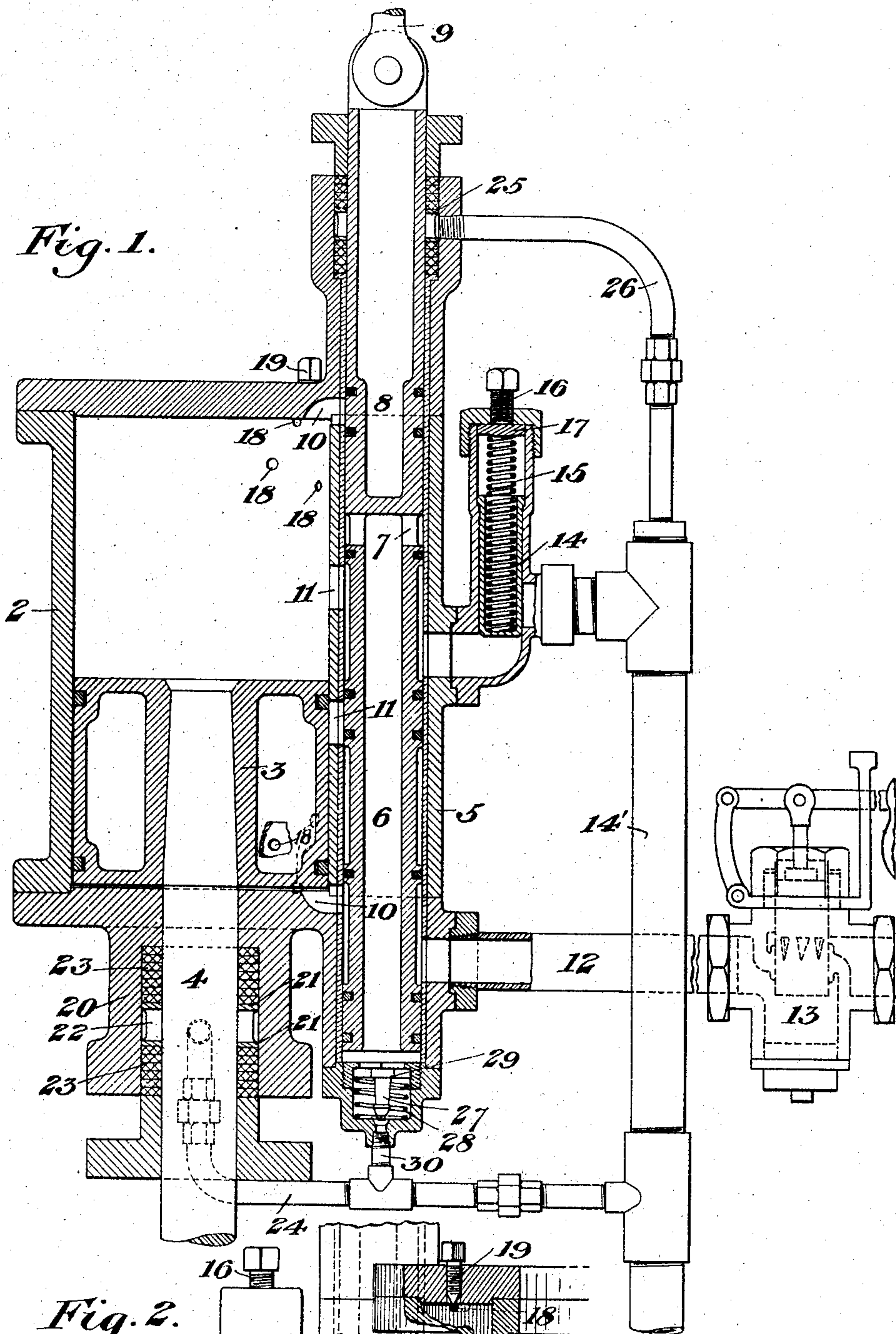


Fig. 2.

WITNESSES

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# UNITED STATES PATENT OFFICE.

WALTER KENNEDY, OF PITTSBURG, PENNSYLVANIA.

## MOTIVE CYLINDER.

SPECIFICATION forming part of Letters Patent No. 781,148, dated January 31, 1905.

Application filed October 8, 1900. Serial No. 32,378.

*To all whom it may concern:*

Be it known that I, WALTER KENNEDY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Motive Cylinders, of which the following is a full, clear and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional side elevation showing my improved motive cylinder and connections, and Fig. 2 is a broken detail showing the means for regulating the cushioning action.

My invention relates to the arrangement and connections of small motive cylinders for actuating elements such as valves, and more particularly to those for actuating blowing-engine valves, such as set forth in my co-pending application Serial No. 22,266, filed July 2, 1900, for blowing-engines; and its object is to improve the packings of the piston-rod leading from the motive cylinder and also to simplify and improve the construction and arrangement of the controlling-valve for the cylinder.

In the drawings, 2 represents a motive cylinder having piston 3, whose piston-rod 4 may be connected to the valve or other device to be actuated. A valve-chamber 5 is preferably cast integral with the motive cylinder and extends along one side and parallel therewith. This valve-casing is provided with a cylindrical bore in which moves a hollow tubular valve 6. This valve is open at both ends and at its upper end is connected by integral bars 7 to the plunger 8, which constitutes the upper part of the valve, and is connected to the actuating-link 9.

10 10 are the inlet-ports, and 11 11 the outlet-ports, of the cylinder, and 12 is the inlet-pipe for the fuel-supply, which enters the lower end of the valve-casing. This inlet-pipe is preferably provided with a regulating-valve 13, by which the inlet-pressure may be adjusted as desired. The outlet-valve 14, leading from the valve-casing, is preferably provided with a spring 15, which is compressed when the valve is opened and the pressure of which

may be regulated by set-screw 16 acting on follower 17.

In order to cushion the piston at the end of its stroke and regulate this cushioning action, I provide the cylinder near its end with an enlargement or pocket 17, into which leads several small holes 18, arranged in an inclined row near the end of the cylinder. The outlet area of these holes is regulated by screw-plugs 19, so that by turning the plugs the cushioning action may be regulated as desired.

In order to prevent the condensation in the cylinder from leaking through the stuffing-box and passing along the piston-rod into the wind-box, whence it would be carried with the air to the blast-furnace or other point where the air is utilized, I provide a stuffing-box 20, with separated metallic rings 21, held apart by spacing-bars 22, these rings being placed between two sets of compressible packings 23. An open chamber is thus formed between the packings, from which a drain-pipe 24 leads to the exhaust-pipe 14'. Any leakage of steam or water through the packing will thus be directed into the exhaust, and I prefer to use this same device upon the upper part of the valve, as shown at 25, a pipe 26 leading from the water-space to the exhaust-pipe. In order to relieve the lower end of the valve-casing from the water of condensation which may collect therein, I provide a small hole in its lower end, in which a valve 27 may seat when forced downwardly by the steam-pressure against the action of a spring 28, which presses upon an upper disk portion 29 of the valve and normally holds it open. A pipe 30 leads from the hole to the pipe 24 and directs the water of condensation to the exhaust.

In the operation of the device when the valve is moved into the position shown in Fig. 1 the entering fluid passes around the lower reduced portion of the valve through inlet-port 10 and forces the piston to the upper end of its stroke. The fluid in the cylinder is exhausted through the outlet 11, and the remaining fluid will cushion the upper end of the stroke, gradually passing out through



the holes 18 to the exhaust. Upon moving the valve upwardly a sufficient distance its lower end is uncovered and fluid passing through it enters the upper inlet-port and moves the piston in the opposite direction.

The advantages of my invention result from the packing connection for the drawing away of water and steam which leak thereinto and from the arrangement and connections of the operating-valve, which cheapen and simplify the construction and improve the operation, owing to the small clearance afforded.

Many changes may be made in the form and arrangement of the collecting-chamber and the packing, the valve and its arrangement, and the other parts without departing from my invention.

I claim—

1. A double-acting motive cylinder having a piston therein, a tubular valve-casing having supply and exhaust ports connecting with the cylinder, an inclined series of outlet-holes near

the end of the cylinder, and means for regulating the size of these outlets; substantially as described.

2. A double-acting motive cylinder having a tubular valve-casing, a hollow valve movable within the casing and arranged to control the supply and exhaust ports, said cylinder having an inclined series of holes near one end, and adjustable plugs arranged to control said holes; substantially as described.

3. A double-acting motive cylinder having a series of outlet-holes near each end, and adjustable plugs arranged to control the outlet through said holes and regulate the cushioning action; substantially as described.

In testimony whereof I have hereunto set my hand.

WALTER KENNEDY.

Witnesses:

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GEO. B. BLEMING.