No. 841,924. PATENTED JAN. 22, 1907.

J. H. BLEOO.

VALVE.

APPLICATION FILED APR. 6, 1906.

Fig. 1

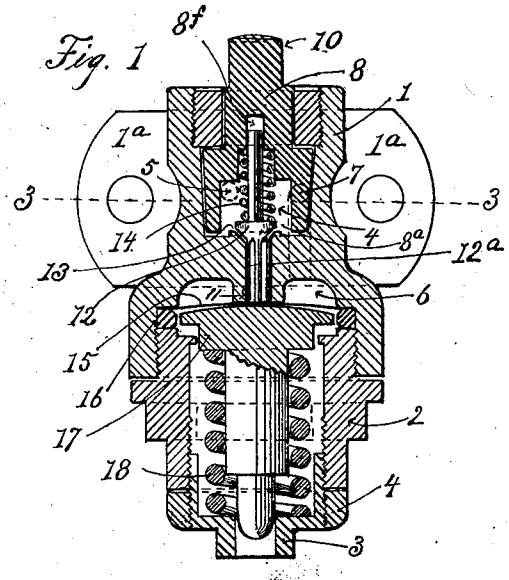


Fig. 2

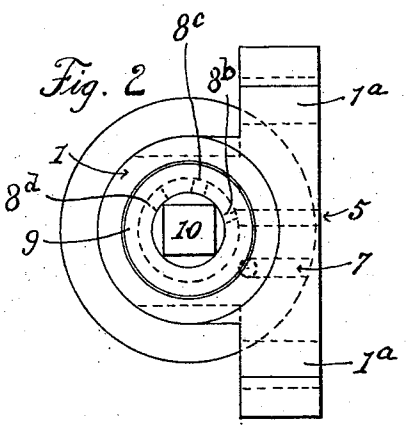
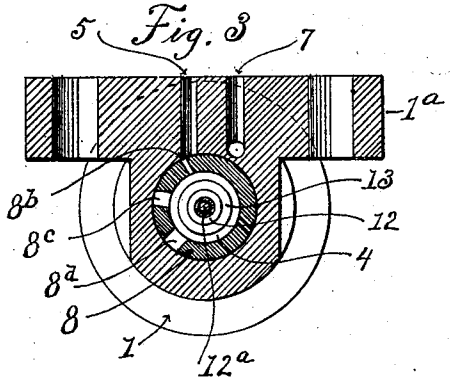


Fig. 3



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VALVE.

No. 841,924. Specification of Letters Patent. Patented Jan. 22, 1907.

Application filed April 6, 1906. Serial No. 310,225.

To all whom it may concern:

Be it known that I, JOHN H. BLEOO, a citizen of the United States, residing in New York city, borough of Brooklyn, New York, have invented certain new and useful Improvements in Valves, of which the following is a specification.

The object of my invention is to provide improved means whereby fluid from a source of pressure may be transmitted at a reduced pressure and the volume of such transmitted fluid may be increased or diminished without thereby materially changing the reduced pressure thereof.

To these ends the invention comprises the novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a central section of a valve embodying my invention. Fig. 2 is a plan view thereof, and Fig. 3 is a horizontal section substantially on the line 3 3 in Fig. 1.

As shown in the drawings, the casing of the valve comprises the members 1, 2, and 3, shown attached together by screw-threads, and at 4 is a nut for locking the parts 2 and 3 together. The member 1 is shown provided with extended parts 1^a, which may be bolted to a support, and said member is provided with a chamber or bore 4, from which a passage 5 leads through the casing. The casing also has a chamber 6, from which a passage 7 leads through the casing. For convenience I have shown the passage 7 leading vertically and horizontally in the member 1. The passage 5 is to communicate with a source of fluid-pressure, and the passage 7 is to communicate with a pipe, reservoir, or other receptacle for the fluid. Within chamber 4 is journaled a plug or cock 8, which has a hollow interior or bore 8^a and whose walls are provided with a plurality of ports 8^b 8^c 8^d to admit fluid into chamber 4 or the bore 8^a from the passage 5 in accordance with the volume desired. The plug 8 is shown rotatively retained within the chamber 4 by a nut 9, and said plug may have a square head 10 to receive a handle for rotating it. The casing has a valve to control the passage 11 between chambers 4 and 6, the stem 12^a of which valve is shown passing through said passage and guided at its upper end in a socket 8^f in plug 8, said valve coacting with a suitable seat 13. At 14 is a spring located in bore 8^a, bearing against the valve and against the plug and serving to push said valve to its seat.

On one side of chamber 6 is a diaphragm 15, shown clamped at its edges between the members 1 and 2, as by an interposed washer 16, to make a fluid-tight joint. On the opposite side of said diaphragm is a spring-pressed plunger 17, guided in bores in members 2 and 3 and the spring 18 also being in said member 2 and adjustable as to tension by the member 3. The valve-stem 12^a normally rests upon the diaphragm 15, and thereby the spring 18 tends to raise the valve from its seat and to compress spring 14.

Assuming that spring 18 is set to the predetermined pressure—say sixty pounds to the square inch—it will raise plunger 17 and lift valve 12 from its seat, and then when plug 8 is turned so that one of its ports alines with passage 5 fluid flowing from said passage into chamber 4 will flow through bore 11 into the chamber 6, and so long as the pressure in chamber 6 is less than the pressure of spring 18 such fluid will flow freely from chamber 6 through passage 7. When, however, the pressure in chamber 6 exceeds the tension of spring 18, as by reason of charging a pipe or reservoir connected with passage 7, the pressure in chamber 6, acting upon diaphragm 15, will push the latter downwardly, relieving the upward pressure on valve 12 and spring 14, and the pressure in chamber 4 and spring 14 will push said valve to its seat and cut off further flow into chamber 6 until pressure in chamber 6 is again reduced, whereupon spring 18 will open valve 10, and so on. The pressure flowing from chamber 6 may thus be maintained substantially constant at a reduction below fluid-pressure in chamber 4.

In some relations variable quantities of fluid are desired at different times, but at a substantially similar pressure, and by reason of plug 8, with its ports of varying size, it is merely necessary to turn said plug to bring either of the ports 8^b, 8^c, or 8^d in the register with passage 5, which will permit the flow of fluid from said passage into chamber 4 in volume according to the size of the port of said plug being used. Thus with a given main-reservoir pressure maintained in passage 5 and a reduced pressure desired in the part

connected with passage 7 the spring 18 can be set to permit the flow of the desired pressure from passage 7, and the volume of such fluid can be controlled at will by turning the plug 8 without materially altering the pressure of such flowing fluid. Of course the plug 8 can be set for any of its ports to register with passage 5 and left in such position as long as desired, or said plug may be shifted at will to change the volume of fluid flowing through passage 7 in accordance with the work being carried on.

My improvement will be found advantageous in fluid-pressure brake systems for railway cars and trains, where a given pressure in the system is required to be maintained and the volume of air flowing to the system is to be altered according to requirements.

Having now described my invention, what I claim is—

1. In a valve, the combination of a casing provided with chambers, and an inlet to one chamber, an outlet from the other chamber and means to limit the pressure of fluid flowing from said outlet, with a plug in the inlet-chamber provided with means to at will permit more or less fluid to flow into said chambers from said inlet.

2. In a valve, the combination of a casing having chambers, a passage between them, a valve to control said passage, and means to operate said valve in accordance with a predetermined pressure of fluid in said chambers, with a plug in the inlet-chamber provided with means to vary the volume of fluid admitted to said chambers.

3. In a valve, the combination of a casing having chambers, a passage between them, a valve to control said passage, and means to operate said valve in accordance with a predetermined pressure of fluid in said chambers, with a plug provided with ports of varying size to control the volume of fluid admitted to said chambers.

4. In a valve, the combination of a casing having chambers and a communicating-passage between them, a valve to control said passage, an inlet into one chamber and an outlet from the other chamber, a diaphragm on one side of the last-named chamber, a spring and plunger to act with said diaphragm against pressure in said chamber, said diaphragm acting with said valve, and a plug in the inlet-chamber provided with means to regulate the volume of fluid admitted to said chamber.

5. In a valve, the combination of a casing having chambers and a communicating-passage between them, a valve to control said passage, an inlet into one chamber and an outlet from the other chamber, a diaphragm on one side of the last-named chamber, a spring and plunger to act with said diaphragm against pressure in said chamber, said diaphragm acting with said valve, and a plug in the inlet-chamber, said plug having ports of varying size to regulate the volume of fluid admitted to the inlet-chamber.

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