

(No Model.)

F. P. HAYS.

PRESSURE REDUCING OR REGULATING VALVE.

No. 371,063.

Patented Oct. 4, 1887.

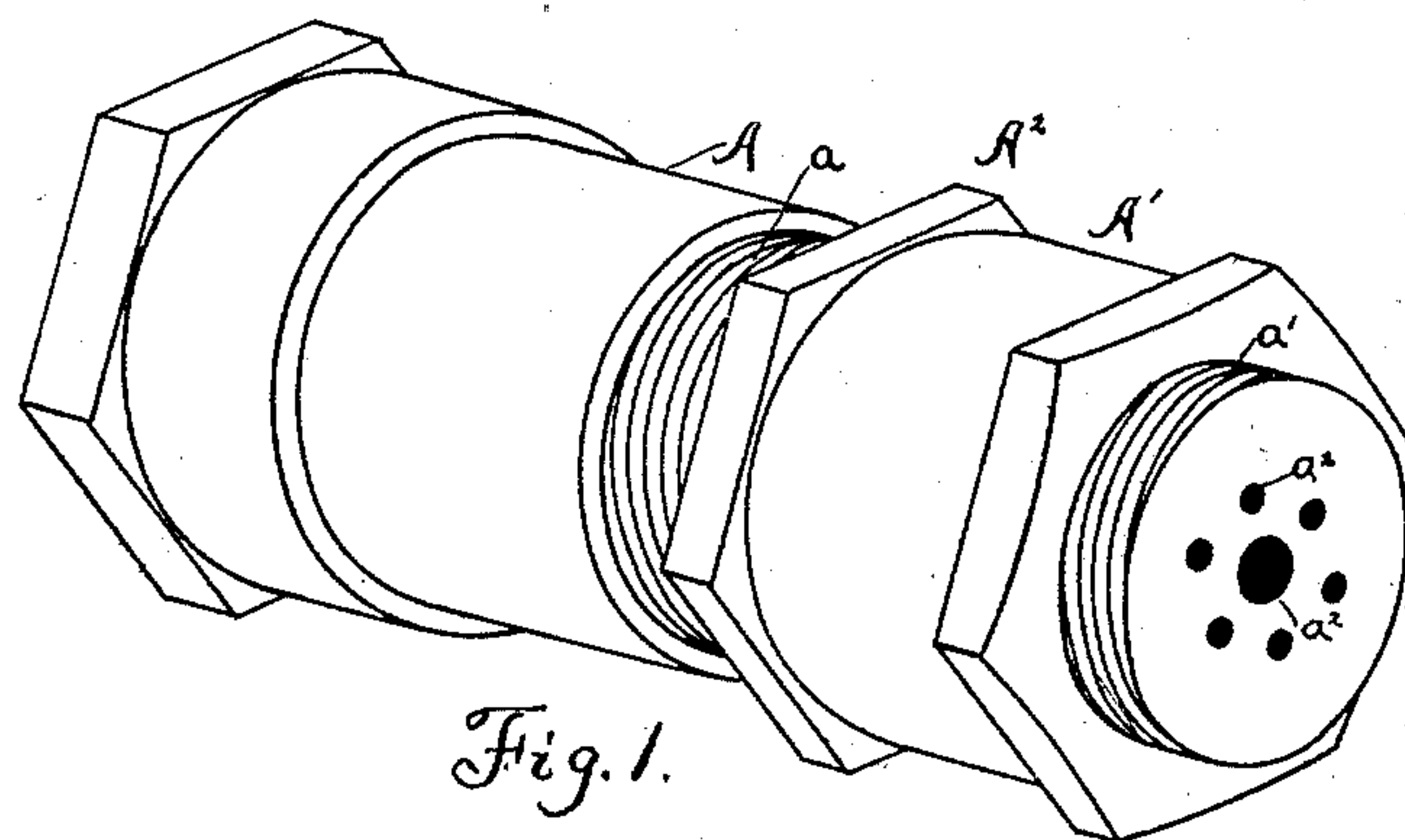


Fig. 1.

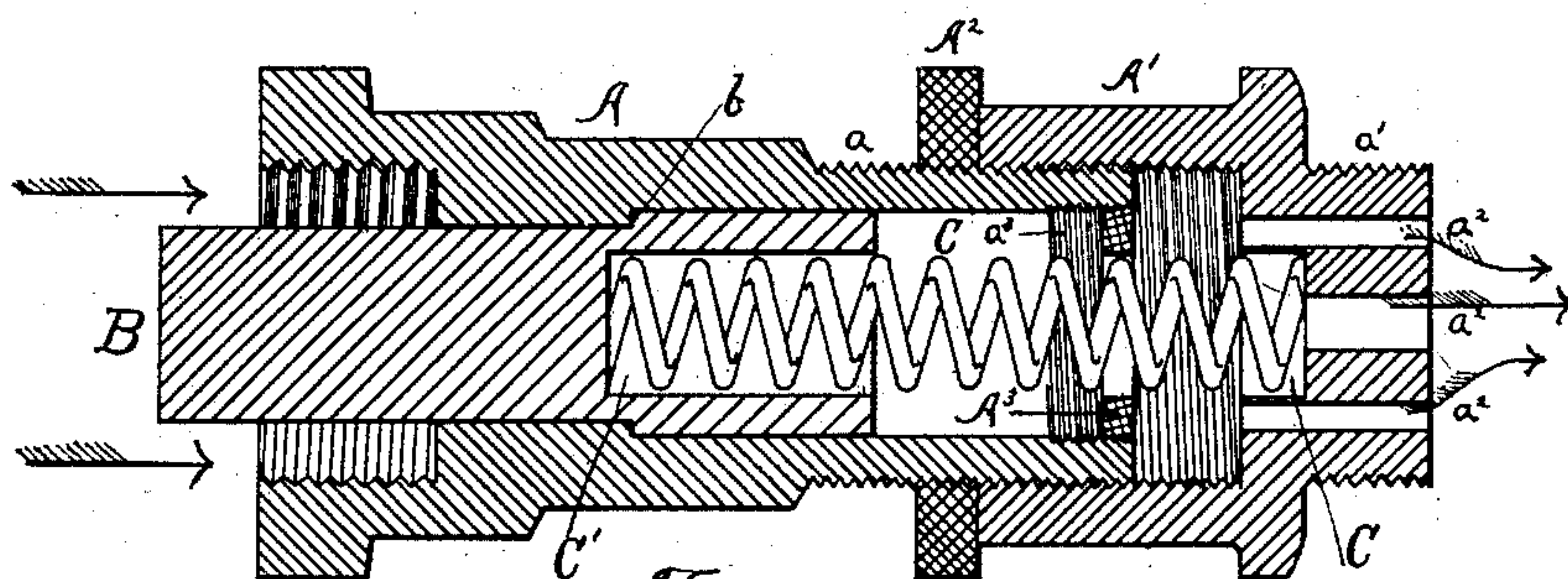


Fig. 2.

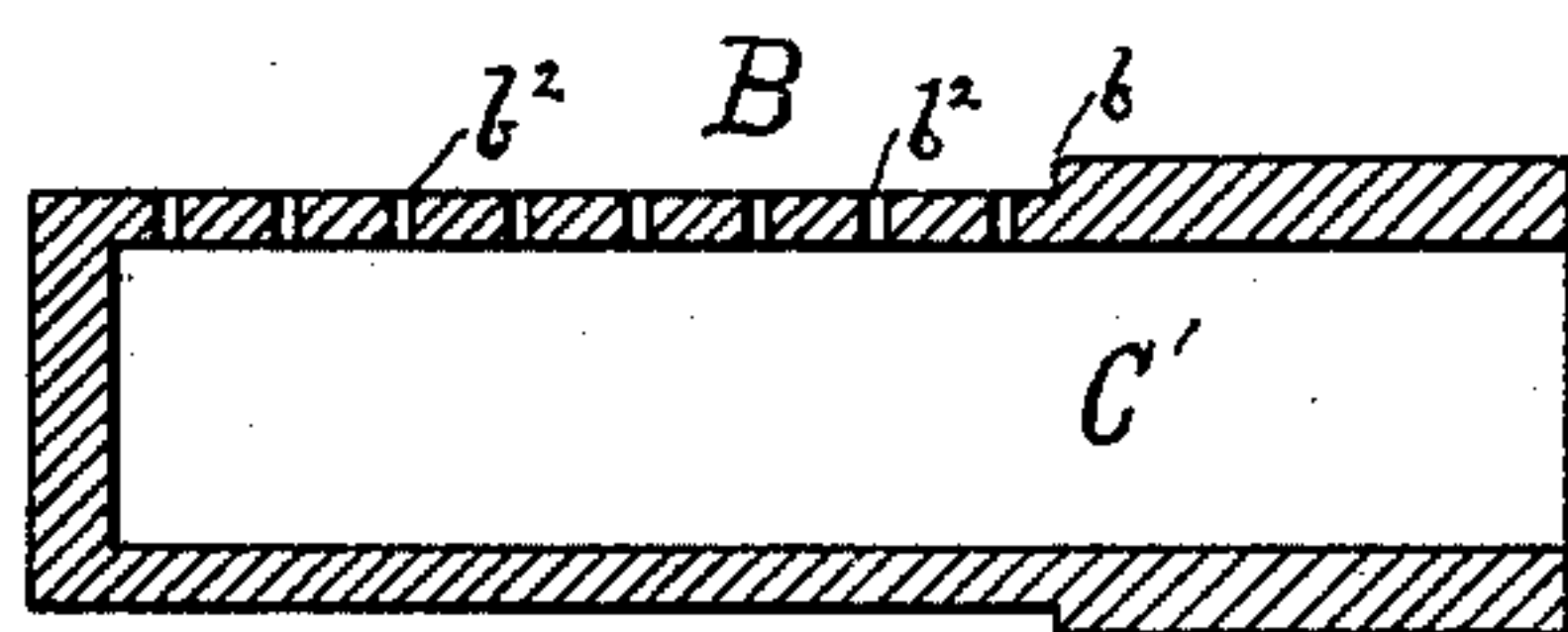


Fig. 4.

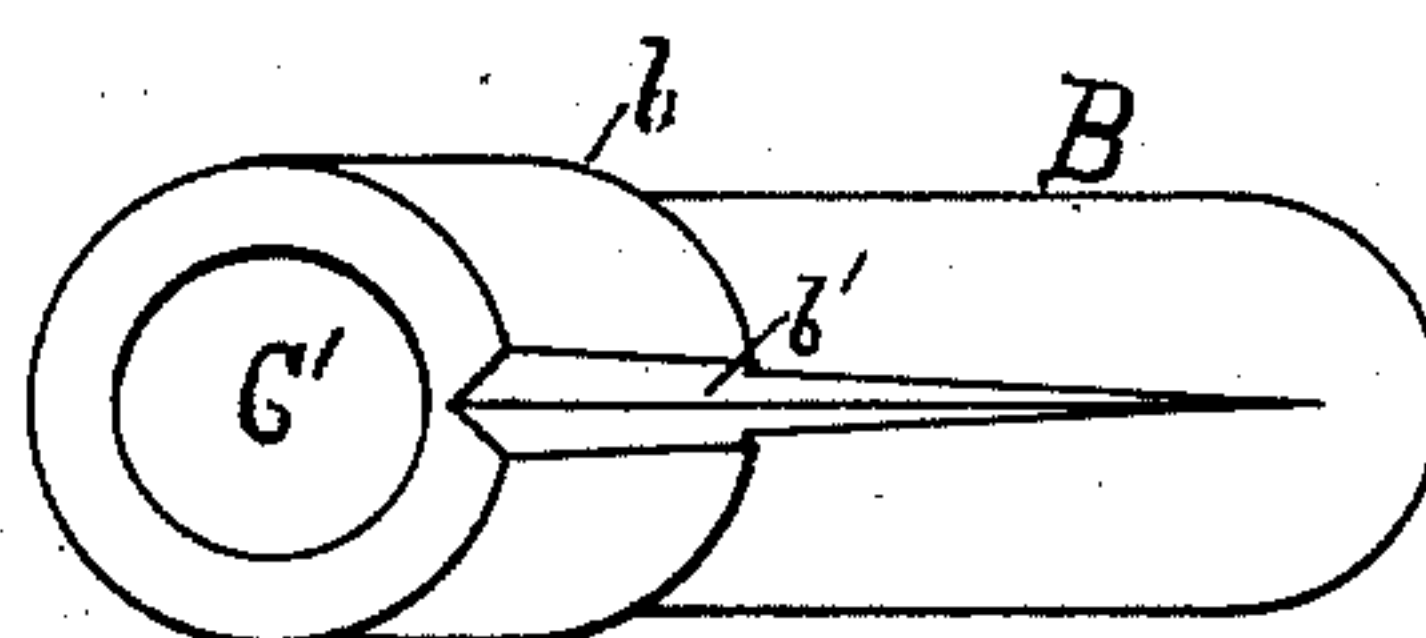


Fig. 3.

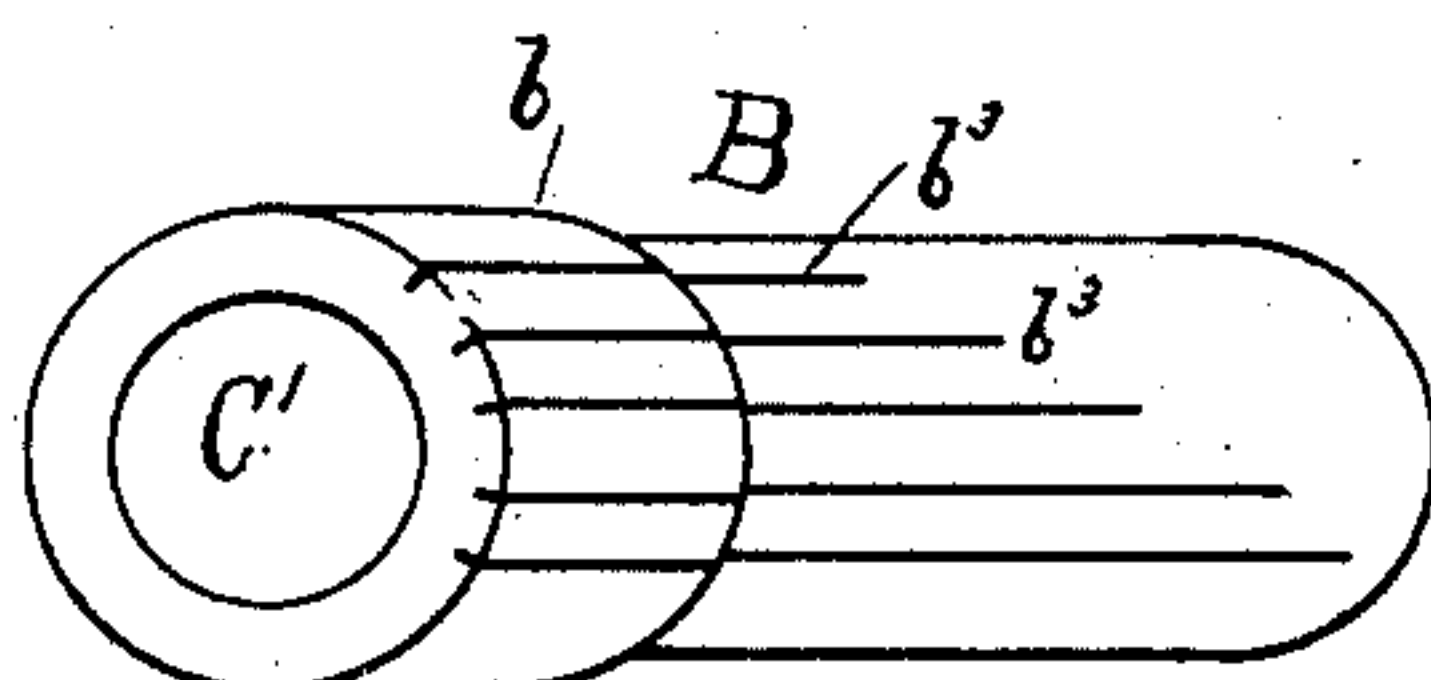


Fig. 5.

Witnesses.

J. H. Combs.

Geo. R. Byington.

Inventor.

F. P. Hays

Per. Hallock & Hallock

Att's.

UNITED STATES PATENT OFFICE.

FREDERICK P. HAYS, OF WARREN, PENNSYLVANIA.

PRESSURE REDUCING OR REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 371,063, dated October 4, 1887.

Application filed March 4, 1887. Serial No. 229,677. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK P. HAYS, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Pressure Reducing or Regulating Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pressure reducing or regulating valves for use in fluid-distribution pipes; and it consists in certain new and useful improvements in the construction thereof, as will be hereinafter fully set forth, and pointed out in the claim.

My device is illustrated in the accompanying drawings, as follows:

Figure 1 shows the valve complete and ready for use. Fig. 2 is a longitudinal sectional view of the valve. Fig. 3 is a perspective view of the plug or plunger of the valve. Fig. 4 is a longitudinal section of the same part shown in Fig. 3, with modifications in its construction. Fig. 5 is a similar view to Fig. 3 and of the same part with modifications in its construction.

The parts of the valve are as follows:

A is the shell or body, and is provided with an external screw-thread, a , at one end, an internal or female screw-thread at the other end for connecting it with the distribution pipe, and it has a longitudinal bore, which is of two different diameters, forming a shelf or offset, and it also has at the large end of this bore a thread, a^3 , for receiving a bush-nut, A^3 .

A' is the cap of the case or body. This part screws onto the thread a , and is provided with openings a^2 a^2 a^2 , &c., and a male thread, a' , for connecting with the distribution pipe.

B is the plug or plunger of the valve. This part is made to fit within the bore of the valve-shell, and has a shoulder, b , which seats upon the offset in said bore.

C is a coiled spring, which weights the plunger B, and it is seated in the cavity c in the cap A' , and the cavity c' in the plunger.

A^2 is a jam-nut for locking the cap A' at any desired point on the screw a .

Arrows in Fig. 2 show the direction of movement of the fluid through the valve.

Figs. 3, 4, and 5 show different forms of plungers which may be used. In Fig. 3 the plunger has a vanishing groove, b' , on its side. In Fig. 5 there are a series of grooves, b^3 , which are of the same size and of varying length. In Fig. 4 the cavity c is extended to nearly the entire length of the plunger, and a series of perforations, b^2 , are made through it. It will be seen that with either of these plugs or plungers in use the greatest passage-way for fluid will exist when the plug is seated on the shoulder b , and that the more the plug is lifted from that position the more will the passage-way for fluid be contracted.

The spring C weights the plunger and tends to keep it seated, and the pressure of the fluid against the protruding end of the plunger (the end at the left of Fig. 2) tends to lift the plunger from its seat and overcome the spring C. The tension of the spring C can be regulated by screwing the cap A' one way or the other. If the spring is set so as to keep the plunger seated against a certain pressure, and the pressure should increase, the plug would be lifted, and this would contract the passage through the plug and thus maintain an even pressure in the pipes beyond the valve.

This valve may be used on gas, water, or steam distribution pipes. It is particularly valuable on pipes for distributing natural gas, and particularly for connecting the service-pipes with the mains, for in the distribution of that fluid it is common to transport it great distances, and to do this successfully a much higher pressure is maintained in the mains than is desirable in the service-pipe or at the burners. When thus used, the valve may be put in the pipe which leads from the main to the pipes in the building; or it may be put on the service-pipes, near the burners.

I am aware of the device shown in patents to Payne, December 22, 1885, and to Franklin January 12, 1886, and I do not claim as my invention the said constructions. While each of the said devices shows a shell or case having a plug or plunger contained and longitudinally movable therein, which has a passage for fluid through it which is more or less

closed or opened as the plug is moved longitudinally, and a spring for weighting said plunger against the pressure of the fluid in the supply-pipe, substantially like my construction in its general features, yet it will be observed, nevertheless, that in specific details of construction my valve differs considerably from the said devices. In Payne's device the fluid first enters the piston or plug, passes through it, and then acts upon its enlarged part by reaction as it is passing into the discharge-pipe. In Franklin's device the fluid acts upon the enlarged part of the plug and drives it toward its seat. In my device the fluid acts upon the small part of the plug and drives it away from its seat. It will also be observed that in Franklin's device the turning of the screw F to add tension to the spring G will lift the plug or valve off its seat, and will, in fact, add no tension to the spring until the valve finds an opposite seat on the reducer H. In my device the screw and spring hold the valve down upon its seat and the pressure of fluid from the supply-pipe acts to lift the valve from its seat. In Payne's device it is the outgoing fluid which acts upon the piston or valve by reaction, while in my device it is the incoming fluid which acts directly on the piston or valve to lift it off its seat, a

feature which is important and is not found in Franklin's device nor in Payne's. In my device the seat of the valve B is the shoulder b, but this is a seat only against the action of the spring, and not against the passage of fluid, for the greatest passage of fluid is possible while the valve is seated, while in Franklin's device the opposite is the case.

What I claim as new is—

In a pressure reducing or regulating valve, the combination, substantially as set forth, of a shell or case having a longitudinal ledged bore the shortest diameter of which is at the end of the case to which the supply-pipe connects, a ledged cylindrical plug or plunger fitting in said bore, which has a graduated passage for fluid past or through it which is contracted as the plug is raised from its seat, a spring for holding said plug upon its seat contained within the outlet-chamber of said casing, and a screw for regulating the tension of said spring.

In testimony whereof I affix my signature in presence of two witnesses.

F. P. HAYS.

Witnesses:

JNO. K. HALLOCK,
W. S. BROWN.