

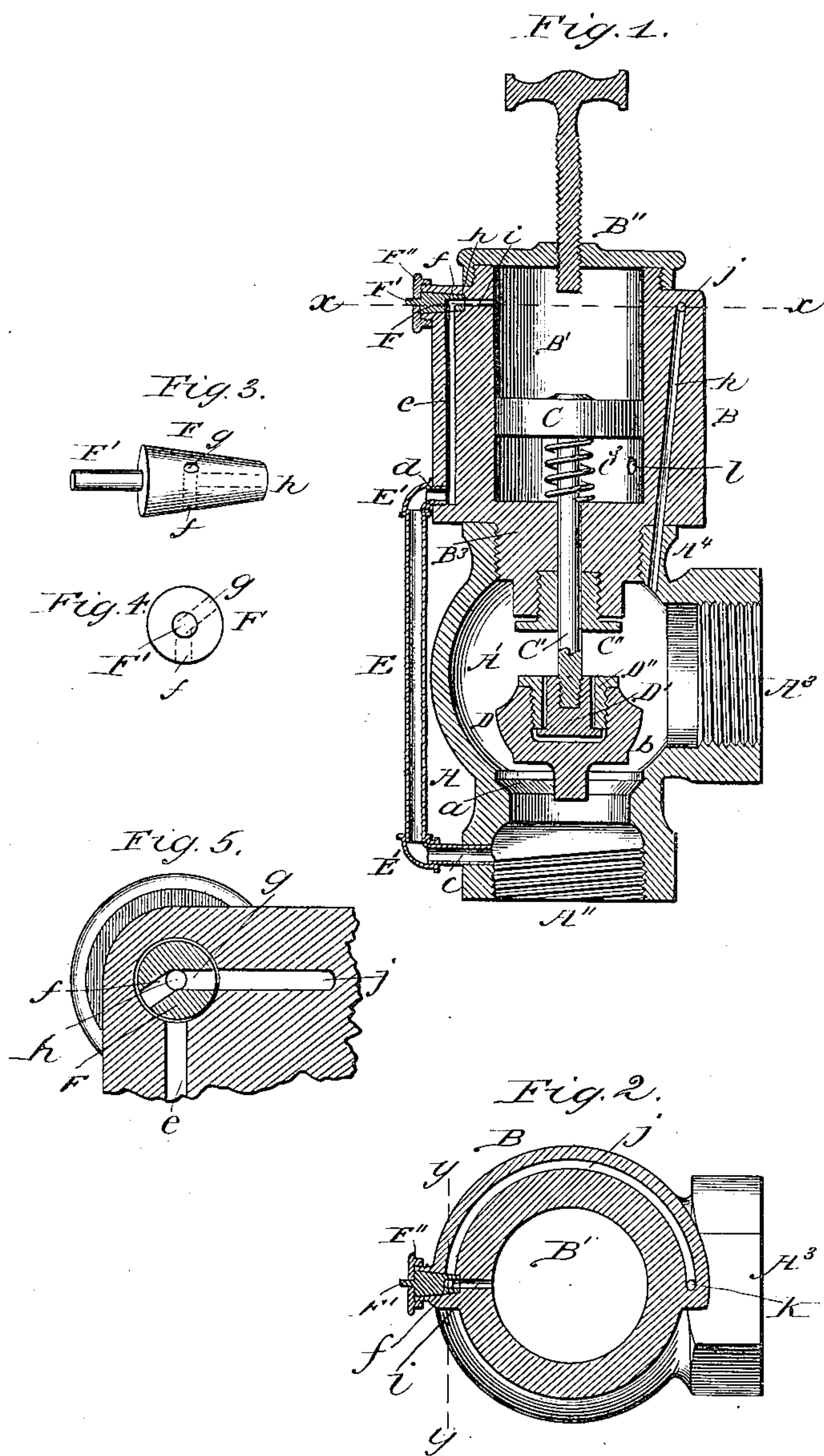
(No Model.)

R. C. PAGE & F. H. SODEN.

VALVE.

No. 338,771.

Patented Mar. 30, 1886.



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VALVE.

SPECIFICATION forming part of Letters Patent No. 338,771, dated March 30, 1886.

Application filed June 26, 1885. Serial No. 169,913. (No model.)

To all whom it may concern:

Be it known that we, RANSOM C. PAGE and FRANCIS H. SODEN, both residing at Chicago, in the county of Cook and State of Illinois, and citizens of the United States, have invented a new and useful Improvement in Valves, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section; Fig. 2, a transverse section on line *xx* of Fig. 1; Fig. 3, a side elevation of the controlling-valve; Fig. 4, an end elevation of the controlling-valve; Fig. 5, a detail in section on line *yy* of Fig. 2.

This invention relates to valves by which the passage of steam, air, water, or other gas or liquid will be controlled in part by the gas or liquid passing through the valve, and has for its objects to construct a valve through which steam, air, water, or other gas or liquid will flow when the valve is open, and which will be closed to shut off the flow of the gas or liquid by the pressure of such gas or liquid acting on a piston or head, all as hereinafter more specifically described, and pointed out in the claims.

In the drawings, A represents a shell or casing having an interior chamber, A', into and out from which the steam, air, water, or other gas or liquid flows. The shell or casing is provided, in the form of construction shown, with a coupling, A'', having an interior screw-thread, and the opening of which leads into the chamber A' and forms the inlet-port, and a coupling, A³, with an interior screw-thread and with an opening leading into the chamber A' and forming the outlet from such chamber, and a coupling, A⁴, for the attachment of the secondary chamber, in which the piston or head operates.

B represents a shell having a cylindrical interior chamber, B', closed at the end by a cap, B'', which, as shown, is screw-threaded onto the end of the shell B. The other end of the shell B is provided with a boss, B³, having an exterior screw-thread to enter the coupling A⁴ and connect the two shells A B together.

C represents a piston or head fitting the chamber B', and suitably packed to form a tight joint with the walls of the chamber. This piston is secured in any suitable manner

to the end of a stem, C', which passes through the boss B³, and a stuffing box or plug, C'', screw-threaded onto the end of the boss, so as to make a close fit for the stem.

D represents a valve attached to the projecting end of the stem C', and having its periphery *b* formed to fit the seat *a* of the inlet-opening into the chamber A', so that such inlet-opening can be opened and closed. This valve, as shown, is attached to the end of the stem C' by a head, D', screw-threaded onto the end of the stem, and a head, D'', screw-threaded into the end of the valve, by which means the valve can be adjusted so as to fit properly onto the seat.

E represents a pipe, connected at one end by an elbow-coupling, E', to a pipe, *c*, leading into the inlet, and connected at the other end by an elbow-coupling, E', to a pipe, *d*, which leads into the shell or case B and communicates with a passage, *e*, running longitudinally of such case or shell.

F represents a plug-valve having a stem, F', and held in place by a cap or stuffing-box, F'', screw-threaded onto a boss on the case or shell B, in which the valve is located. This valve has a port, *f*, running transversely from its exterior to its center and communicating with a longitudinal opening, *h*, and a second port, *g*, also communicates with this opening *h*, and the two ports *f g* stand at right angles, or nearly so, to each other, as shown by the dotted lines in Fig. 4. The opening *h* communicates with an opening, *i*, extending through the shell or case B, and entering the chamber B', so that when the port *f* is in communication with the passage *e* the gas or fluid will pass through the port *f* into the passage *h*, and through the opening *i* into the chamber B'.

The shell or case B, in line with the center of the plug-valve F, is provided with a passage or opening, *j*, which extends from the valve around the shell or case to the opposite side and communicates with the passage *h*, running longitudinally of the shell or case and communicating with the chamber A', as shown in Fig. 1, and the passage or opening *j* is shown by the dotted and full lines in Figs. 1 and 2; and this passage, when the plug-valve is properly turned, communicates with the port *g*, so that the gas or fluid can pass from the cham-

ber B' into the passage *i*, through the opening *h*, into the port *g*, around through the passage *j*, into the passage *k*, and into the chamber A'.

In use the valve is to be attached by the coupling A'' to the pipe or conduit through which the steam, air, water, or other gas or liquid passes; and when the gas or liquid is to pass through the chamber A' and out at A³ the valve D is held above the seat by pressure on its end face, and from the inlet A'' by the action of the spring C³, located around the stem C', between the piston-head C and the end wall of the chamber, as shown in Fig. 1, to do which the plug-valve F is turned to have the port *g* thereof in communication with the passage *j*, so that the piston or head C is left free from the pressure of the gas or fluid in the chamber B', the gas or liquid passing out from back of the piston as communication is opened through the passages *h i*, port *g*, and passages *j k*, and as soon as the pressure is relieved and the piston returned to open the valve, the valve F is turned to close the passages *j k* from communicating with the port *g*, and also to close the communication between the port *f* and passage *e*, thus preventing back-pressure in the chamber B' from the passages *j k* and direct pressure from the passage *e*, by which means, it will be seen, the chamber B' is entirely free from pressure; and when from any cause it is desired to close the inlet into the chamber A' the plug-valve F is rotated or turned to bring the port *f* into line with the passage *e*, such turning carrying the port *g* still farther away from its point of communication with the passage *j*, and leaving a clear passage through the port *f* and openings *h i* into the chamber B', and in this position the gas or fluid from the conduit passes into the pipe *c*, thence through the pipe E into the pipe *d*, and, entering the passage *e*, passes through the port *f* and openings *h i* into the chamber B', and forces forward the piston or head C, closing the inlet by forcing the valve down onto the seat *a*; and the inlet will be held closed until the pressure of the gas or fluid on the piston or head C is removed by turning the plug-valve to close the port *f* and open the port *g* for the gas or fluid to pass out through the port *g* into the passage *j k* to the chamber A', and when this occurs the spring acts and opens the valve, allowing

the gas or fluid to pass through the chamber A'. It will thus be seen that by means of the piston or head C, operated in part by the pressure of the gas or liquid and in part by the spring C³, an effectual means is furnished for controlling the passage of the gas or liquid through the chamber A', and the motive power for actuating the piston or head in the direction to shut off the flow is the gas or liquid, the passage of which is to be controlled as the pressure of such gas or liquid on the piston or head forces it forward to close down the controlling-valve, for the passage through which the gas or liquid enters the chamber A', and in closing down the valve the pressure of the gas or liquid only is used; and in order to have no resistance to speak of forward of the piston in closing down the valve a hole or opening, *l*, is provided through the wall of the shell B for the discharge of air forward of the piston.

When the valve is open for the admission of gas or liquid through the chamber A', the plug-valve F is to be turned to entirely shut off the ports *f g* from communication with the passages *e j*, by which means the full pressure of the gas or liquid is utilized without passing through the chamber B' and creating a pressure on the piston C that might close or partly close the valve D.

What we claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of the shell or case B, having the chamber B', ports *e, i, j*, and *k*, the cock F, having the passages *f g h*, and the exterior pipe, E, with the shell or case A, having the chamber A', and the stem C', piston C, and valve D'', substantially as and for the purpose herein set forth.

2. The case A, having the chamber A', case B, having the chamber B', valve C, stem C', spring C³, and valve D, in combination with the outlet *c*, pipe E, inlet *d*, and passage *e*, and a controlling-valve and passages leading to and from the chamber B', for opening and closing the valve, substantially as specified.

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