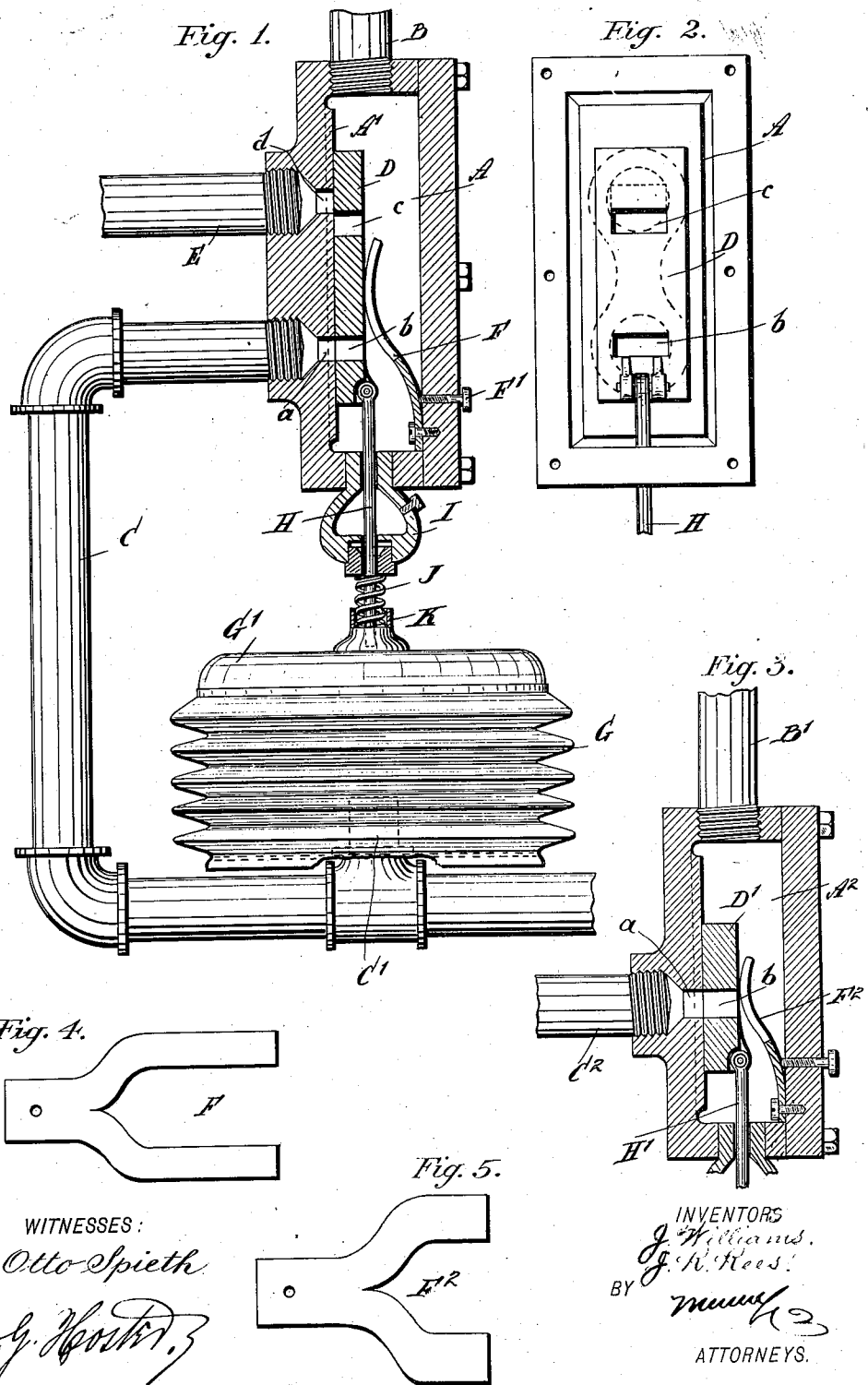


(No Model.)

J. WILLIAMS & J. R. REES.
FLUID PRESSURE REGULATOR.

No. 601,923.

Patented Apr. 5, 1898.



UNITED STATES PATENT OFFICE.

JENKIN WILLIAMS AND JOSEPH R. REES, OF PUEBLO, COLORADO.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 601,923, dated April 5, 1898.

Application filed May 19, 1897. Serial No. 637,217. (No model.)

To all whom it may concern:

Be it known that we, JENKIN WILLIAMS and JOSEPH R. REES, of Pueblo, in the county of Pueblo and State of Colorado, have invented a new and Improved Safety Pressure-Regulator, of which the following is a full, clear, and exact description.

The invention relates to regulators for use in supply-pipes carrying natural or artificial gas, water, air, steam, or other fluid; and the object of the invention is to provide a new and improved safety pressure-regulator which is simple and durable in construction, very effective, and automatic in operation.

The invention consists of certain parts and combinations, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement, with parts in section. Fig. 2 is a face view of the chest with the cover removed. Fig. 3 is a sectional side elevation of a modified form of the improvement, and Figs. 4 and 5 are face views of the springs for holding the valve to its seat in the chest.

The improved pressure-regulator is provided with a chest A, connected by the pipe B with the main, through which passes the natural or artificial gas, water, air, steam, or other fluid.

In the chest A is formed a valve-seat A', from which leads a port *a*, which connects with the service-pipe C, extending into the house or other building, or connects with a machine, apparatus, or other device. On the valve-seat A' is mounted to slide a valve D, having a port *b*, adapted to register with the port *a* to allow the fluid entering the chest A from the main to pass through the said ports into the service-pipe C and from the latter to the burner, machine, or other apparatus. The valve D is also provided with a second port *c*, adapted to register with a port *d*, opening into a pipe E, leading to the atmosphere. The ports *c* and *d* are normally disconnected at the time the ports *a* and *b* are in full register with each other, as indicated in Fig. 1. The valve D is held to its seat by a spring F, secured to the inside of the cover of the chest,

and the tension of the spring can be regulated by a screw F', screwing in the cover against the face of the spring to hold the free end thereof with more or less force in contact with the valve to hold the latter properly to its seat, so as to prevent leakage between the contacting surfaces of the valve and its seat A'.

The service-pipe C is provided with a short branch pipe C', which opens into a bellows G, rigidly connected at its top G' with a rod H, extending through a stuffing-box I into the chest A to connect with the valve D. A spring J is coiled on the rod H and rests with its upper end on the gland of the stuffing-box, while the lower end extends into a cup K, attached to the top G' of the bellows, the said cup being adapted to abut against the gland when the bellows G are fully expanded, thus preventing breaking of the spring J, as further movement of the cup is then prevented and the spring cannot be closed beyond a certain limit.

The stuffing-box I is preferably formed with a chamber adapted to be filled with oil to prevent the fluid passing into the chest A from leaking through the stuffing-box, at the same time lubricating the rod H in the stuffing-box.

The operation is as follows: When the several parts are in the position as shown in Fig. 1, then the fluid from the main can readily pass through the chest A and ports *a* and *b* into the pipe C and from the latter to the burners or other places and devices on which it is used. The fluid from the pipe C also passes through the branch pipe C' into the bellows G to expand the latter, so as to hold the valve D in the open position shown and described. Now when the pressure in the main increases beyond a normal pressure then the pressure in the pipe C causes the bellows G to expand still further, whereby the valve D is moved upward to cut off the ports *a* and *b* and to connect the ports *d* and *c* with each other to form an escape of the fluid from the chest A through the pipe E. When the pressure increases, then the bellows G collapse correspondingly and the ports *d* and *c* are again cut off and the ports *a* and *b* are moved in register with each other.

In case of the breaking of the pipe C by accident or through fire or otherwise the said

pipe is suddenly released of its pressure, and consequently the bellows G collapse to move the valve D into a closed position by cutting off the ports *a* and *b*, and thus shutting off the supply of the fluid to the pipe C. Thus in case of a fire in a house the supply of gas, for instance, or that of water, is automatically shut off by the arrangement described.

As shown in Fig. 3, the pipe E is entirely omitted, but otherwise the construction is the same as above described—that is, the chest A² is connected by the pipe B' with the main, and the fluid passing from the chest to the service-pipe C² is controlled by the valve D', pressed on by a spring F² and connected by the rod H' with the bellows.

By the arrangement described the valve D regulates the connection between the main and service-pipe on an increase of pressure; but when the pressure in the main falls below a normal pressure then the valve D cuts off the connection between the chest A and service-pipe C completely, and the valve does not return automatically into an operative position on a subsequent increase of pressure. Thus it is evident that no gas can pass to the supply-pipe C on such increase of pressure in the main or to the burners in the house, which are usually left open, and consequently the house or other building is not filled with gas and explosions are not liable to result.

In order to again set the valve D into an operative position on return of pressure, it is necessary for the operator to expand or draw out the bellows G by hand, so as to open connection between the ports *a* and *b* by shifting the valve D or D' accordingly.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a fluid-pressure regulator, the combination of a chest having an inlet and an outlet orifice, and having a valve-seat formed around the outlet-orifice, a slide-valve mounted on the seat and commanding the outlet-orifice, a spring attached to the interior of the chest and pressing the slide-valve against

the seat, a rod attached to the slide-valve, a spring actuating the rod, and a bellows in connection with the rod whereby to actuate the same.

2. In a fluid-pressure regulator, the combination of a chest having an inlet and an outlet orifice, the chest having a valve-seat formed around the outlet-orifice, a slide-valve mounted on the valve-seat and commanding the outlet-orifice, a spring attached to the interior of the chest and pressing the slide-valve against the seat, a rod attached to the slide-valve and moving through a gland in the chest, and means for actuating the rod whereby to move the slide-valve.

3. In a fluid-pressure regulator, the combination of a chest having an inlet and an outlet orifice, the chest having a valve-seat formed around the outlet-orifice, a slide-valve moving on the valve-seat and commanding the outlet-orifice, a spring attached to the interior of the chest and pressing the slide-valve on the seat, a rod attached to the slide-valve, a packing-gland in one wall of the chest through which gland the rod reciprocates, a bellows in connection with the rod and having communication with the outlet-orifice of the chest, and an expansive spring surrounding the rod and bearing against the bellows and against the packing-gland.

4. In a fluid-pressure regulator, the combination of a chest having an inlet and an outlet orifice therein, a slide-valve commanding one of the orifices, a rod attached to the slide-valve, a packing-gland in one wall of the chest through which gland the rod reciprocates, a bellows attached to the rod and having communication with the orifice commanded by the valve, and an expansive spring surrounding the rod and bearing against the gland and bellows.

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Witnesses:

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