J. KAYSER.

Pressure-Gage.

No. 219,735. Patented Sept. 16, 1879.

Figure 1.

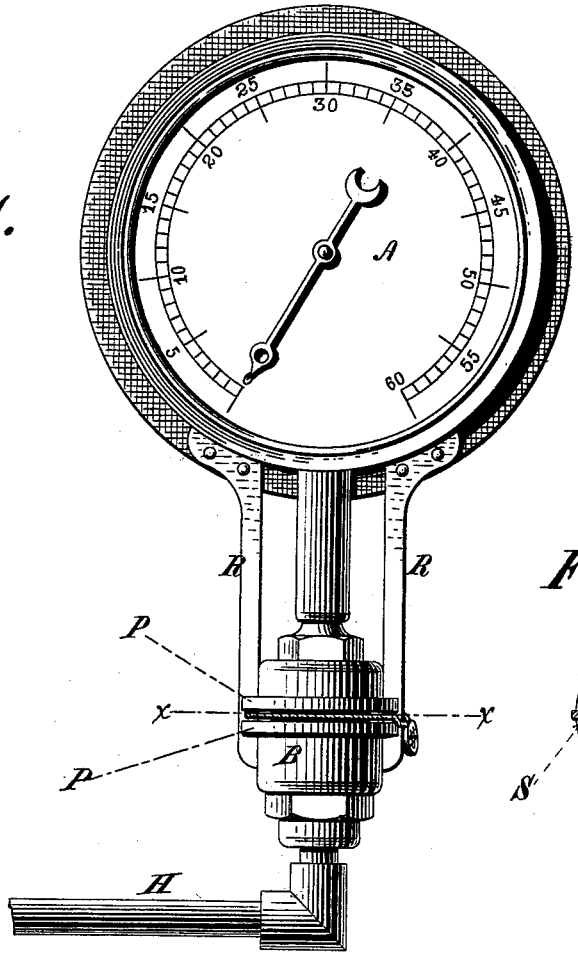


Figure 2.

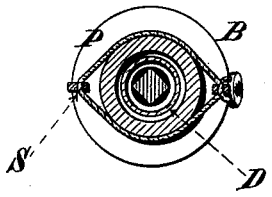


Figure 4

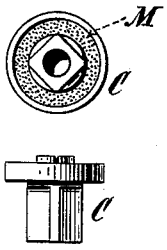
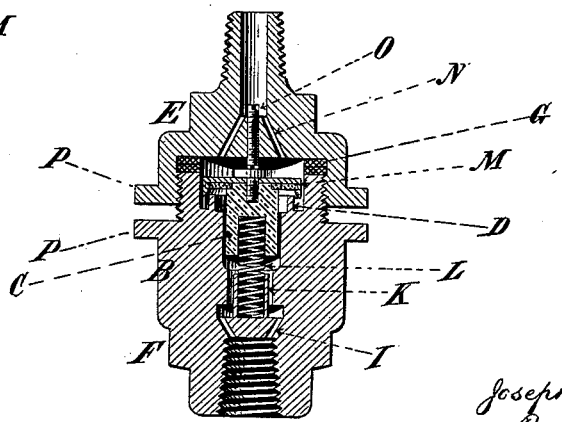


Figure 3.



Witnesses:

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UNITED STATES PATENT OFFICE

JOSEPH KAYSER, OF NEW YORK, N. Y.

IMPROVEMENT IN PRESSURE-GAGES.

Specification forming part of Letters Patent No. **219,735**, dated September 16, 1879; application filed February 25, 1879.

To all whom it may concern:

Be it known that I, JOSEPH KAYSER, of the city and State of New York, have invented a new and useful Improvement in Automatic High-Pressure Indicators, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

It is well known that great difficulty is often experienced in obtaining information as to the exact pressure at which a boiler explosion takes place, owing to the fact either that the witnesses were killed by the explosion or are unwilling to state the pressure as it actually was. I have, therefore, devised a means of automatically registering this pressure, and of substituting the positive and certain testimony of a machine for the uncertain testimony of man; and this I have done by attaching to an ordinary steam-gage an automatic valve, which will show and retain in the gage the pressure which exists there at the time of an explosion. This valve is so constructed that it will allow the gradual flow of steam or air past it, but will close as soon as there is a sudden movement of such air or steam.

My improved valve consists, essentially, of a very carefully fitted and ground check-valve, arranged to be perfectly tight and to hold any pressure without leaking. This valve is situated in an annular chamber, and is so balanced, by means of a spring or its equivalent, that it will remain open during the normal condition of the apparatus, but as soon as there is a sudden return of the air contained within the gage this valve will automatically close; and this valve is useful not only in connection with steam-gages, but with other apparatus.

By removing the spring from my apparatus it becomes an automatic high-pressure register, and will register the highest pressure to which the gage has been subjected.

My apparatus can be clearly understood from the accompanying drawings, of which Figure 1 represents an elevation; Fig. 2, a cross-section through Fig. 1, on the line X X; Fig. 3, a cross-section through my valve and valve-chamber, and Fig. 4, independent views of the valve.

A represents a pressure-gage. In its normal condition this gage and the communicating-chambers are all filled with air.

B represents, generally, the valve-chamber, details of which will be presently explained. C represents the valve, and D the valve-seat.

The valve chamber consists generally of an upper portion, E, and lower portion, F, which are screwed together and properly packed by packing G, or in some similar way. The lower portion, F, does not have a passage bored straight through, but the air, passing in by the connecting-pipe H, passes through inclined passages I, which are cut through the metal of the lower piece. Within the chamber is a spring-supporting tube, K, which supports a spring, L, upon which the valve C rests, as is clearly shown in the sectional view. This valve is provided with packing M on its under surface, which packs against the valve-seat D.

The upper portion, E, is also provided with inclined channels N, similarly arranged to those in the lower portion, and the upward movement of the valve is arrested by an adjustable screw, O, which only allows it to rise a determined distance from its seat. The upper and lower portions are provided with corresponding lips P, provided with vertical slots S. One or more arms, R, may be attached to the gage, entering these slots, and a cord or ribbon may be arranged to run through holes in the same, which may be sealed, thereby preventing any alteration or tampering with the gage. Otherwise the upper part might be unscrewed and the pressure relieved. I propose, in making new gages, to make the upper part and the gage in one piece, so as to prevent this difficulty. The inclined passages I are also arranged for this purpose, to prevent the introduction of a wire and the tripping of the valve thereby.

The operation can now be understood. The variations in pressure in a boiler being usually gradual, they will pass up through pipe H, through channels I, past the valve, and into the gage, and will have no effect on the valve C; but as soon as the pressure below this valve is suddenly released the down-rush of the air or steam will close it, and the pressure in the gage will remain at the point at which it was

when the release of pressure took place. It is very important that this valve should close as rapidly as possible, and I have therefore provided the adjusting-screw O, so as to set it as close as possible to the seat D.

It will be observed that the passage around the valve is left as open as possible by making the valve-stem square instead of cylindrical.

By simply removing the spring L the gage becomes a maximum-pressure register; but in the form shown it has this advantage over the ordinary maximum-pressure register, viz., that it registers the pressure at the time of the explosion, and not the highest pressure which exists before it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The improved valve hereinbefore described, which consists of a balanced valve closing against a valve-seat and arranged with ports and passages, so as to allow the gradual passage past it of a gas or fluid in either direction, but to close immediately on the sudden movement of the fluid past it by reason of the immediate proximity of the valve and seat, substantially as described.

2. The improved valve herein described, which consists of a valve and seat, and the ports and passages shown, thereby allowing the gradual movement of a fluid past it, but closing on the sudden movement of such fluid, said valve being provided with an adjusting contrivance determining the height which it can rise from its seat, substantially as described.

3. In combination with a pressure-gage, a check-valve opening toward the gage only, thereby causing such gage to register the maximum pressure, substantially as described.

4. In combination with a pressure-gage, a valve allowing the gradual passage of a fluid past it, but closing on the sudden movement of such fluid, thereby causing said gage to register the pressure at the time of an explosion or other sudden release of pressure, substantially as described.

5. The combination of a steam-gage, check-valve, and apparatus for preventing the release of the pressure in the steam-gage after said check-valve has closed, substantially as described.

6. The combination of a check-valve and balancing-spring raising such valve from its seat, but allowing it to remain in immediate proximity thereto, thereby forming a valve allowing the gradual passage of a fluid past it, but closing on the sudden movement of the same, substantially as described.

7. The combination of a check-valve elevated from its seat by means of a spring against an adjustable stop, said stop operating to adjust the valve in immediate proximity to its seat, substantially as and for the purposes described.

8. The combination of a steam-gage and a check-valve arranged with inclined passages for the purpose of preventing the opening or tampering with such valve after it is removed from the boiler-connection, substantially as described.

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