G. H. CROSBY.
Water-Gage.

No. 208,963. Patented Oct. 15, 1878.

Fig. 1.

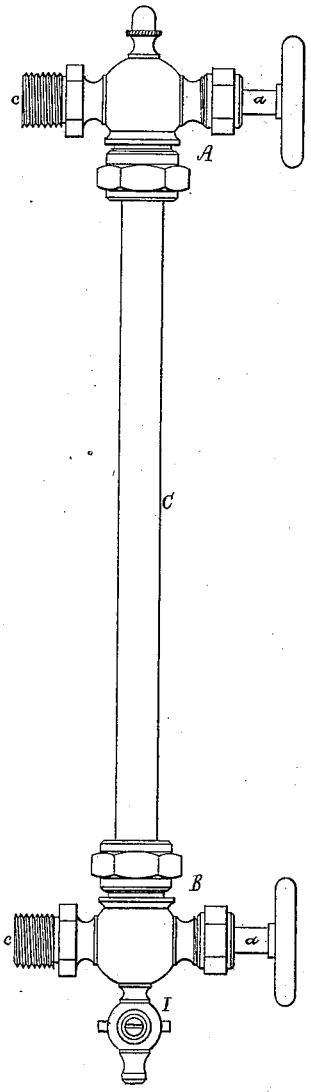
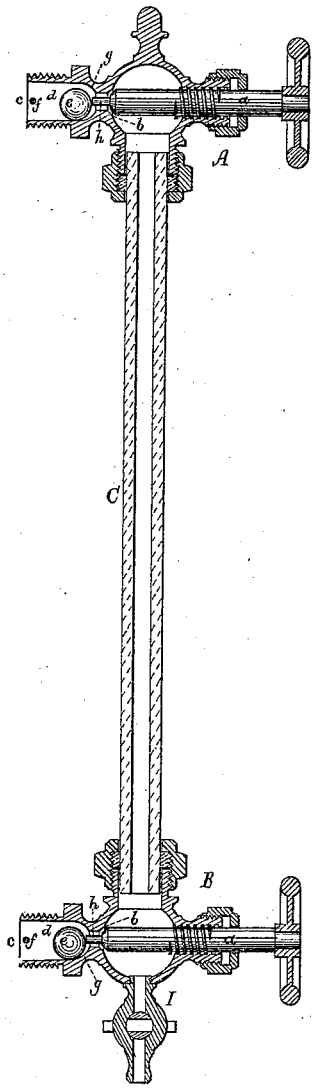


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE H. CROSBY, OF EAST SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN WATER-GAGES.

Specification forming part of Letters Patent No. **208,963,** dated October 15, 1878; application filed March 8, 1878.

To all whom it may concern:

Be it known that I, GEORGE H. CROSBY, of East Somerville, of the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Safety Water-Gages for Steam-Boilers; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side view, and Fig. 2 a longitudinal section, of a gage provided with my invention, which relates to such gages as are furnished with safety ball-valves, that, on breakage of the glass tube of the gage, immediately close upon their seats and prevent the escape of water and steam from the boiler.

In carrying out my invention I combine with the gage mechanism for forcing each of the safety-valves off its seat, as occasion may require, and each of such valves I make as a ball or sphere, and arrange it in a tapering chamber provided with a stop-bar, all being substantially and to operate as hereinafter explained.

In the drawings, the gage is represented as composed of two cocks, A B, and a glass tube, C, extending from one to the other and opening into each of them. These cocks, when the gage is in use, are to be screwed into the boiler, one being above and the other below the mean level at which the water is to stand therein.

The stem *a* of each cock screws into the body of the cock, and at its inner end is formed so as to enable it to close tightly upon the seat *b* at the induct *c* of the body. In rear of such induct, and in the tapering mouth *d* of the cock, there is a spherical or ball valve, *e*, which is kept in the mouth by a bar, *f*, extending diametrically across such mouth. The mouth is formed with a seat, *g*, for the ball-valve to close upon. The said mouth *d* is slightly conical, or has its bottom sloping or inclined a little downward from the seat *g* toward the bar *f*. This causes the ball *e*, when forced off the seat, to be, by the force of gravity, rolled back to the bar. Thus, by having a ball-valve instead of a plug-valve, and having the bottom of the mouth inclined downward from the seat to the stop-bar, the valve is caused to automatically roll back to the stop-bar when the valve is relieved of pressure. Consequently not only is the steam or water allowed freer access to the gage when the valve is back, but there becomes less danger of the valve being stopped in action by deposits or incrustations. Furthermore, there projects from the inner end of each stem *a* a short stud, *h*, of sufficient length to force the safety or ball valve a short distance off its seat before the stem may abut against its own seat.

To the lower cock I usually affix a petcock, I, for discharging water or deposits from it or the gage, as occasion may require.

On breakage of the glass tube the two spherical valves will instantly be closed on their seats, so as to prevent the escape of steam and water from the boiler through the cocks.

Having substituted a fresh or entire glass tube for the broken one, it will be necessary to force the two ball-valves off their seats in order to allow the water and steam to gain proper access to the tube. This can be effected by screwing in the two stems until the water and steam may have duly entered the gage, and the water may stand therein at the level at which it may be in the boiler, in which case there will be no pressure on either ball-valve tending to close it upon its seat.

It will be evident that the seat *b* for the end of the valve-stem to act against may be dispensed with, as without it the instrument would be operative as a safety-gage; but it is better to have the seat *b*, as it enables the induct of the cock to be closed by the valve-stem in case of the ball-valve not closing tightly upon its seat, which may sometimes occur by reason of any deposit or foreign substance or matter getting between them.

In the United States Patent No. 183,200 one only of the cocks of the water-gage therein described is shown as provided with a slide-valve and mechanism for forcing it off its seat, in order to allow steam from the boiler to pass about such valve and into the gage. Such valve differs from my valve in construction, and is placed in a cylindrical mouth. Consequently it cannot roll back to its stop-bar by the action of gravity, as will my valve, on being relieved of pressure, the chamber in which my valve is placed being tapering or provided with an inclined bottom.

In my gage, having a ball-valve and chamber and stop-bar to each of the cocks, as described, the lower as well as the upper cock becomes automatically closed on breakage of the glass tube. Such is not the case where the upper cock only is furnished with such additions, for, though steam from the boiler may be estopped from escaping, water will escape until the stem of the lower cock is screwed up so as to close such cock. Therefore my gage contains devices and elements of combination not found in that described in the said Patent No. 183,200.

I claim—

In combination with the glass tube C and the two gage-cocks A B, arranged as described, the studs *b b*, the ball-valves *e e*, and their chambers *d d*, provided with stop-bars and inclined bottoms, all being arranged and applied substantially as and to operate as set forth.

GEO. H. CROSBY.

Witnesses:
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