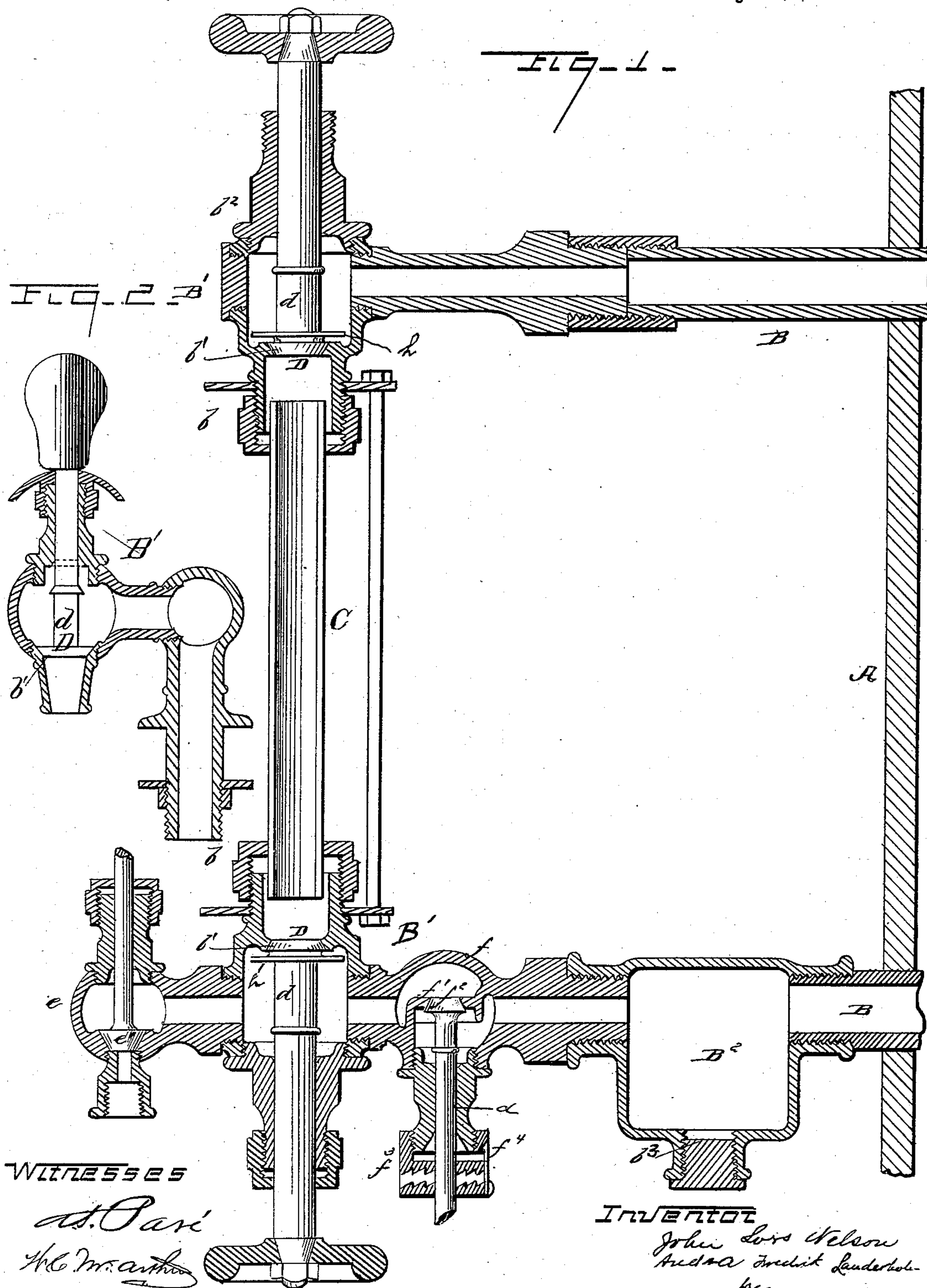


(No Model.)
J. L. NELSON & A. F. LANDERHOLM.

SAFETY STEAM AND WATER GAGE.

No. 316,998.

Patented May 5, 1885.



Inventor
John Lars Nelson
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UNITED STATES PATENT OFFICE.

JOHN L. NELSON AND ANDRA FREDRIK LANDERHOLM, OF CHICAGO, ILL.

SAFETY STEAM AND WATER GAGE.

SPECIFICATION forming part of Letters Patent No. 316,998, dated May 5, 1885.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that we, JOHN L. NELSON, a citizen of the United States, and ANDRA F. LANDERHOLM, a subject of the King of Sweden, residing at Chicago, in the county of Cook and States of Illinois, have invented certain new and useful Improvements in Steam and Water Gages, of which the following is a specification.

10 This invention relates to an improvement in steam and water valves especially adapted for use upon glass gages for boilers; and it consists of a valve of peculiar construction and arrangement, substantially as will be herein-
15 after more fully set forth and claimed.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring
20 to the accompanying drawings, in which—

Figure 1 is a sectional view of our invention applied to a water-gage. Fig. 2 is a modification of the same adapted to a faucet or blow-off cock.

25 A represents a steam-boiler, and B B the pipes secured in the sides of this boiler, and which are connected by a glass tube or gage, C, showing the height of the water within the same. The upper pipe B is at its outer end provided with a T-connection, B', in the lower end of which is a packing-box, b, for receiving the end of the glass gage-tube C, as shown. The interior of the T-connection B' is formed with a valve-seat, b', and provided
35 with a valve, D, seated thereon, the stem d of which extends out through a packing-box, b², above. This stem works back and forth through the box b², and it will be seen at once that the attachment of the stem behind the valve proper gives the lower face of the valve an area
40 larger than the upper, and it is thus held open.

It will be observed that the interior of the T-connection B', in which the valve operates, is a small cylinder, which the valve nearly fills, leaving only a small space around the periphery of the valve for the passage of steam. This enables the steam and water to pass around the valve and equalize the pressure upon the same; but when the glass is broken the valve is
45 driven outward like a piston, and the small space for the escape of steam around it insures the proper closing of the valve. The valve D

is formed with a periphery or flange, h, on its upper part, as seen in Fig. 1, which nearly fills the cylinder, leaving only a small passage
55 for the steam and water, and, receiving the impulse of the same, insures the closing of the valve. The lower pipe B is provided with a valve-seat and valve of precisely similar construction and working in exactly the same
60 manner. When steam is raised and these valves are pulled open, the pressure of steam or water within the pipes and glass tube being equal in all directions holds the valves D D open by reason of the greater area of their
65 seating-faces; but should the glass become broken by any accident, the pressure upon the faces of the valves being at once removed, that upon their rear sides instantly closes them and effectually prevents the escape of steam
70 or water. The lower pipe B is provided with an enlargement, B², for the reception of sediment, which may be drawn off by the opening b³ in the bottom, which is usually closed by a plug.
75

To facilitate blowing out the gage, and thus more effectually cleaning it, we provide the T-casting B' of the lower pipe B with a blow-off cock, e, having a valve, e', of the kind just described, and place in the pipe B, between
80 the main valve D and the sediment-chamber B², a common globe casting, f, having a seat, f', and a valve, f², such as already described. The stem of this valve we provide with a rigid collar, f³, outside the globe, and to this is secured a spring-latch, f⁴, engaging with notches
85 in the casting, as seen in Fig. 1, and which serve to hold this valve open until it is desired to close it. By closing this valve and opening the blow-off e we remove the sediment
90 from the gage and upper pipe, while by leaving the valve f² open and opening the blow-off the lower pipe B is also cleaned.

We are aware that valves have been placed in the connections of glass water-gages; but in
95 case of breakage these have always had to be screwed down, thereby giving time for filling the room with steam or hot water and exposing the attendant to great risk in doing it. This valve is wholly automatic, and is thrown
100 shut the instant the pressure is removed from its face.

It will be evident that when the boiler is in use the pulling back of one of the valves D

will admit the steam and water to the glass and force the other back also, both being held so by the pressure of steam upon their faces, which are larger than their backs. The moment the glass is injured the pressure is removed from the faces of the valves, and that upon their rear sides at once closes them and retains the steam and water. To insure this automatic opening of the valves it is necessary that the stem of each should pass through the pipe to the outer air, as when this is not so the pressure will be equal upon both sides of the valve and it will not be moved.

In Fig. 2 is shown the application of the device to blow off cocks and faucets, and in this construction or application the valve is self-closing by reason of the pressure behind it and the freedom to slide in its guides as soon as the handle is released.

We are aware of the Patent No. 68,038, granted to Augustus P. Brown, dated August 27, 1867, for improvement in water-gages and the invention therein described, and we do not claim the same; but

What we do claim, and desire to secure by Letters Patent, is—

1. In a steam or water gage, a glass or tube connected to the boiler by suitable pipes having cylindrical chambers at the ends of the glass, in combination with two valves having their seating-faces of larger area than the rear faces, and nearly filling the cylindrical cham-

bers in which they move, and a valve-stem upon each valve sliding freely through the stuffing-boxes to the outer air, substantially as and for the purpose herein set forth.

2. In a steam or water gage, the pipes B B', constructed with cylindrical chambers in rear of their valve-seats, valves D D, nearly filling the chambers, and having their stems sliding freely through the packing-boxes, and the glass *a*, in combination with the blow-off *e* and valve *f*, constructed as herein described, whereby the gage is readily cleaned or blown off in whole or part, substantially as set forth.

3. In a steam or water gage, the valve D, provided with the periphery or flange *h* and stem *d*, whereby the impulse of the steam or water is received and the valve closed, substantially as shown and described.

4. In a steam or water gage, the enlargement or chamber B², located in the pipe B, between the boiler and gage and projecting below the pipe, in combination with casting *f*, having seat *f'*, valve *f*², and stem *d*, substantially as shown and described, and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN L. NELSON.

ANDRA FREDRIK LANDERHOLM.

Witnesses:

W. C. MCARTHUR,

M. ANDERSON.