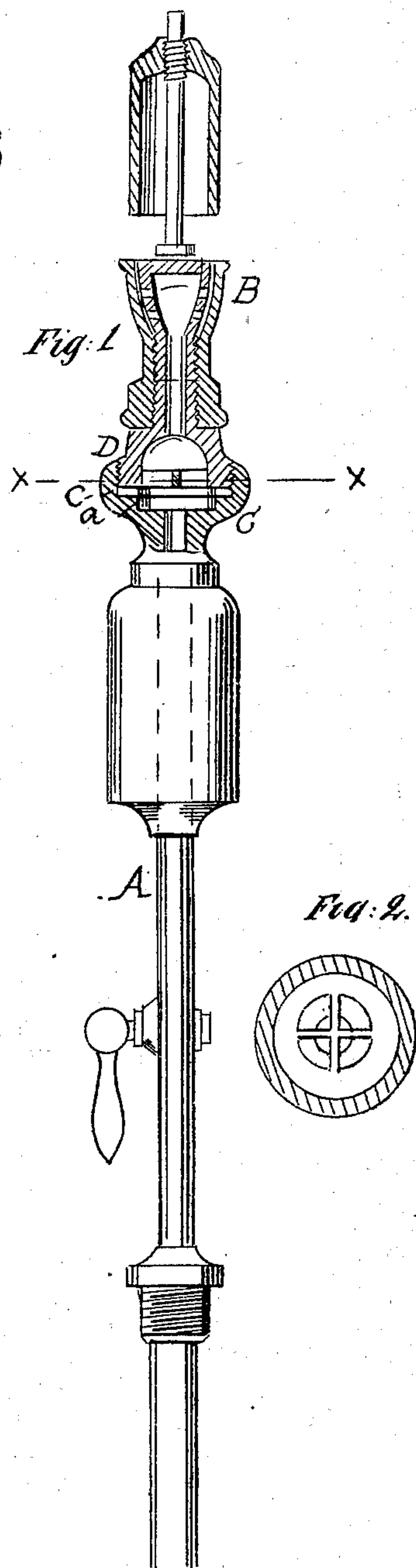


*L. F. Smith. Improv<sup>d</sup> in Low Water Indicator.*

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PATENTED  
DEC 3 1867

Witnesses.  
*Thos Insehn*  
*J. A. Service*

Inventor:  
*L. F. Smith*  
*Per Munnell*  
*Attorney*

# United States Patent Office.

LEVI F. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

*Letters Patent No. 71,803, dated December 3, 1867.*

## IMPROVEMENT IN LOW-WATER INDICATORS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, LEVI F. SMITH, of Philadelphia, Philadelphia county, Pennsylvania, have invented a new and useful Improvement in Low-Water Indicators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved method of ascertaining when there is a deficiency of water in a steam-generator; and it consists in the arrangement of a recess, disk, and steam-whistle with a tube connected with the boiler, which recess shall hold a plate of fusible metal, or some equivalent substance, which shall melt or be dissolved or broken when heated above a certain temperature, and thereby give notice when there is a deficiency of water in the boiler, as will be hereinafter more fully described.

Figure 1 represents a sectional longitudinal view of the tube and the parts connected therewith.

Figure 2 is a cross-section through the line *x x*.

Similar letters of reference indicate corresponding parts.

A is a tube connected with the boiler by passing it through the shell of the boiler, with its lower end extending down to and below the required water-line. This tube is surmounted by a steam-whistle, B. The part which contains the fusible metal or other material is marked C, which is the upper end of the tube. D is a section of a tube, the lower portion of which is seen in the cross-section, fig. 2. The recess which contains the fusible metal or other material is seen at *a*. *c* is a washer, which may be used when elastic material is used; and the cross-bars seen in fig. 2, on the bottom of D, are for the purposes of supporting such material against the pressure of the steam.

The operation is as follows: While the lower end of the tube A is immersed in the water, the tube will be filled with water by the pressure of the steam in the boiler. The fusible plate, or other material which may be readily destroyed or disintegrated at given temperature, is supposed to be in recess *a*, and secured in its place by the part D, which is firmly screwed down upon it. Now, if the water in the boiler falls below the end of the tube A, steam will enter the tube and displace the water. The water in the tube, being surrounded by the atmosphere, would be at a temperature below 212°, but the steam, (if the boiler were under, say, sixty pounds' pressure) would be at a temperature of near 300°. The consequence would be that the fusible plate or other material would be melted or destroyed, and the steam would immediately rush up and blow the whistle, and thus give notice of the deficiency of water in the boiler to the engineer, who would at once put the pump to work. The cock in the pipe (shown in red) would be turned, the whistle, with the part D, would be unscrewed and removed, and water would be poured into the pipe. The part of the tube marked C would serve as a funnel for this purpose. A new plate of fusible metal or other material would be placed in the recess *a*, when the part D and the whistle would be replaced, and the indicator would be ready to give another alarm in case the pump did not keep up the proper supply of water in the boiler.

Having thus fully described my invention, I claim as new, and desire to secure by Letters Patent—

The arrangement of the part D, recess *a*, washer C, cross-bars *e*, pipe A, and whistle B, substantially as herein set forth.

The above specification of my invention signed by me, this 9th day of April, 1867.

LEVI F. SMITH.

Witnesses:

WM. F. McNAMARA,

ALEX. F. ROBERTS.