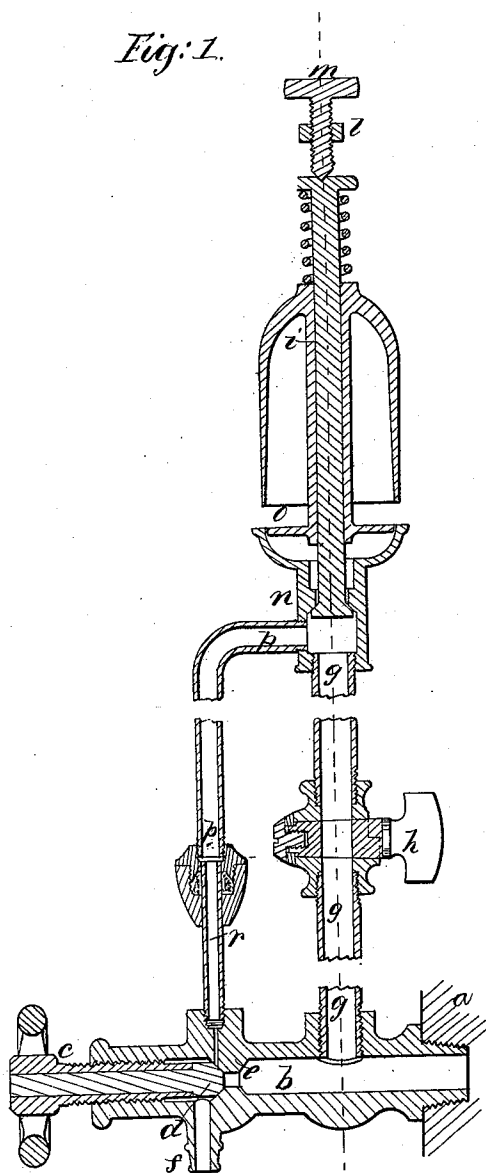


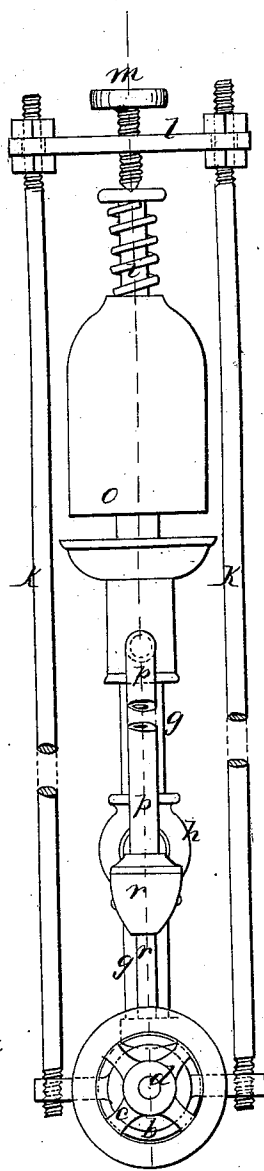
A. J. Maris,
Steam-Boiler Indicator.
N^o 82,856. Patented Oct. 6, 1868.

Fig: 1.



Witnesses;
Chas. W. Smith
Geo. D. Walker

Fig: 2.



Inventor;
Andrew J. Maris.
Lemuel W. Jewell

United States Patent Office.

ANDREW J. MARIS, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
WILLIAM H. BURNAP, OF SAME PLACE.

Letters Patent No. 82,856, dated October 6, 1868.

IMPROVEMENT IN INDICATORS FOR STEAM-BOILERS.

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, ANDREW J. MARIS, of the city and State of New York, have invented and made a certain new and useful Improvement in Indicators for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a vertical section of my improved indicator, and

Figure 2 is an elevation of the same.

Similar marks of reference denote the same parts.

Indicators for steam-boilers have heretofore been made to act as an alarm in case the water gets low. A metallic tube containing water has been used in connection with a steam-whistle, and arranged so that the water is displaced by steam as soon as the level of the water in the boiler falls below the lower end of said tube. The steam taking the place of comparatively cool water, causes an expansion of the metallic tube and the opening of the valve to a steam-whistle.

In low-water indicators of this character, danger has arisen of the alarm becoming inoperative from two causes: The water-tube may become obstructed with sediment or the impurities of the water that come to the surface in the form of foam and slime, thus preventing the water in the metallic tube running out, even when the water-level has descended below the lower end of said tube. The second cause, sometimes rendering these alarms inoperative, is the accumulation of atmospheric air and other gaseous materials in the expansion-tube, displacing the water gradually, and preventing steam entering the tube, even when its lower end is above the water.

Gauge-cocks are generally deemed a reliable attachment for a boiler, and an engineer is more likely to perform all his duties faithfully if the gauge-cock has to be frequently examined.

The nature of my said invention consists in arranging an expansion alarm-tube with the gauge-cock, in such a manner that the trying of the gauge-cock keeps the inlet to the expansion-tube constantly free from sediment, and at the same time induces a circulation through the expansion-tube, sufficient to draw away any accumulation of air or gases, and insure the tube being full of water, and in a proper condition for work.

In the drawing, *a* represents a portion of the boiler to which the gauge-cock is attached. My apparatus should be applied to the gauge-cock at the low-water level, if more than one gauge-cock is used.

The gauge-cock represented consists of the barrel *b*, handle and screw *c*, valve *d*, conical valve-seat *e*, and delivery-nozzle *f*, but any desired character of gauge-cock may be employed.

The expansion-tube *g* is to be connected to the gauge-cock between the valve-seat *e* and boiler, so as always to be open to the water of the boiler; and this expansion-tube *g* may stand in any convenient position to said gauge-cock. I have, however, shown the same as vertically above it, and provided with a cock, *h*, to shut off the expansion-tube in case of accident. This cock generally will not be required.

At the upper end of the tube *g* is a steam-whistle or other alarm. I have shown the side-rods *k k*, cross-head *l*, set-screw *m*, to the valve-rod *i*, and valve, to sustain and adjust the same and the valve-seat *n* and whistle *o*, as upon the end of the tube *g*, so that the expansion of said tube, when steam is allowed to pass into it, shall raise up the valve-seat sufficiently from the valve to cause the sounding of the alarm.

From the upper part of the tube *g* a pipe, *p*, descends, that has an opening through the conical valve-seat *e*, so as to be closed by the valve *d* of the gauge-cock; and to allow freely of expansion in the tube *g*, a separation may be made in this tube *p*, and a packed telescopic joint provided, as at *r*.

It will now be understood that when the gauge-cock is opened, the exit of hot water will keep the lower end of the tube *g* open and free from sediment, and the speed with which the water issues will produce a suction through the tube *p*; hence the expansion-tube *g* cannot be obstructed by either sediment or gases.

The tube *p* does not require to be large, and hence but a small amount of warm water will pass up into the

tube *g* each time the gauge-cock is tried, and there will be no risk of the indicator becoming inoperative; but if the state of the water is not properly tested by the gauge-cock, and the supply kept up, the alarm will be sounded, and indicate the low state of the water, and the failure of the attendant to examine his gauge-cocks, thus giving great security, and promoting attention on the part of the engineer.

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

The expansion-tube alarm and gauge-cock, arranged in substantially the manner set forth.

In witness whereof, I have hereunto set my signature, this 28th day of August, A. D. 1868.

ANDREW J. MARIS.

Witnesses:

E. B. CURRY,

M. SHAW.