J. L. WALKER.
Low-Water Indicator.

No. 207,322. Patented Aug. 20, 1878.

Fig. 1.

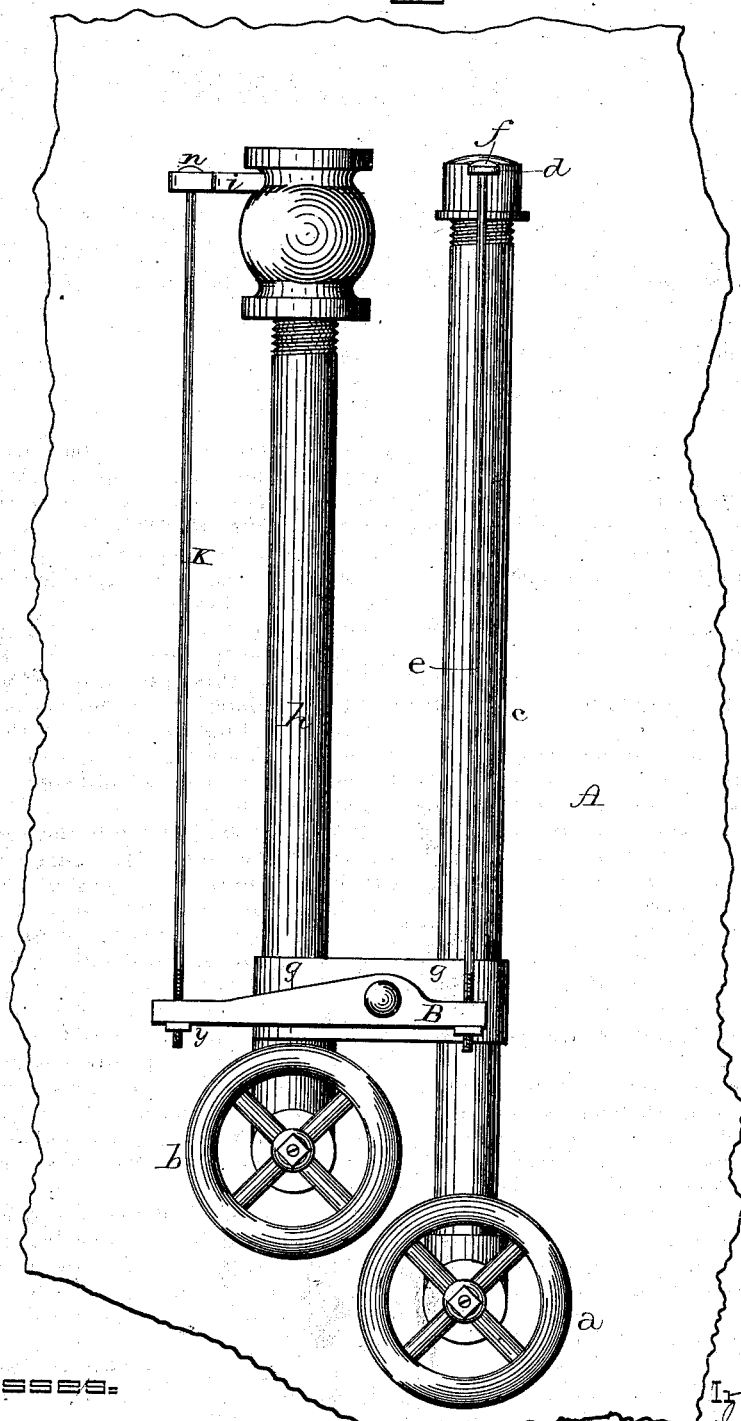
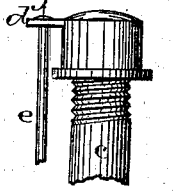


Fig. 2.



Witnesses.
J. W. Garner.
W. S. D. Baines.

Inventor:
Jas. L. Walker,
per
J. A. Lehmann
Atty

UNITED STATES PATENT OFFICE.

JAMES L. WALKER, OF TURKEY CITY, PENNSYLVANIA.

IMPROVEMENT IN LOW-WATER INDICATORS.

Specification forming part of Letters Patent No. **207,322**, dated August 20, 1878; application filed July 13, 1878.

To all whom it may concern:

Be it known that I, JAMES L. WALKER, of Turkey City, in the county of Clarion and State of Pennsylvania, have invented certain new and useful Improvements in Low-Water Indicators for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in low-water indicators for steam-boilers; and it consists in the arrangement of a lever communicating by rods attached to its ends with the upper extremity of an expansion-tube on one side, and with an alarm apparatus on the other, which lever is operated automatically by the expansion of the tube when the water in the boiler has receded below a certain line, causing the alarm to be sounded, as will be fully described hereinafter.

The accompanying drawings represent my invention.

A represents a steam-boiler. To the outside of the boiler are attached the gage-cocks *a* and *b*, in the former of which is inserted the expansion-tube *c*. This tube may be made of small diameter, but should not be less than five feet in length, to show a perceptible degree of expansion when heated.

The top of the tube *c* is closed by a cap or other device, and from its upper edge projects an ear or lug, *d*, in which is a hole for the passage of the rod *e*. The upper end of this rod *e* is provided with a knob, *f*, which, when the rod is passed into the hole of the lug *d*, rests upon it. The other end of the rod *e* extends through the shorter arm of the lever B, which lever is pivoted to the double clamp *g*, which surrounds the tubes *c* and *h*. At the end of the rod *e*, under the lever, is a thumb-screw for the adjustment of the length of the rod. The fulcrum of the lever is removed from the center, making the arm between the rod *e* and the pivot the shorter.

The tube *h* is inserted in the gage-cock *b*, and carries at its upper end the alarm apparatus. From this apparatus extends an arm, *i*, through which passes the rod K, which terminates in a knob, *n*, on top of the arm. Its other end, extending through the longer arm of the lever B, may be adjusted by means of a thumb-screw, *y*.

So long as the water fills the boiler to a prescribed line or above the gage-cocks no expansion of the tube *c* takes place; but when the water has dwindled down to below this line the heat of the rising steam causes the tube to expand upward, and, by means of the rod *e*, to raise the shorter arm of the lever B; and as the fulcrum of the lever is not in the center, the downward motion of the longer arm is in proportion greater as the distance from the center is increased, so that a slight movement of the shorter arm will be quite sufficient to affect the arm *i* to sound the alarm.

Having thus described my invention, I claim—

The combination of the two cocks *a b*, tubes *c h*, rods *e k*, knobs *f n*, lever B, and an alarm or whistle, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of July, 1878.

JAMES L. WALKER.

Witnesses:

F. A. LEHMANN,

J. W. GARNER.