

J. F. THOMPSON.

Low-Water Alarm for Steam-Boiler.

No. 220,262.

Patented Oct. 7, 1879.

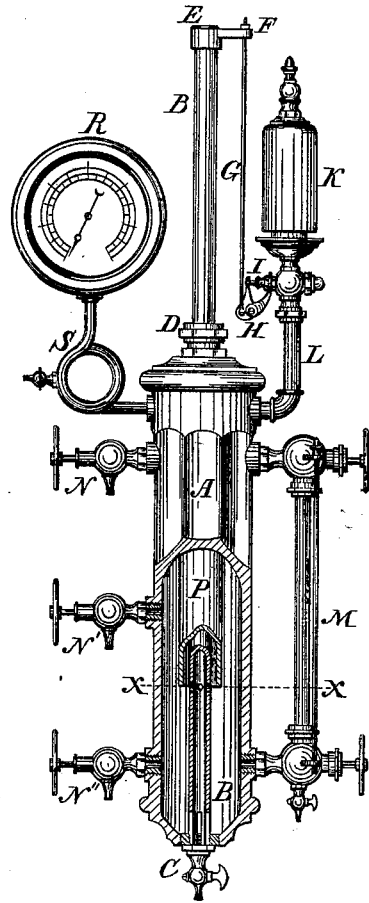


FIG. 1.

WITNESSES:

Edw. Turner
J. M. Boland

INVENTOR:

John F. Thompson

UNITED STATES PATENT OFFICE.

JOHN F. THOMPSON, OF TROY, NEW YORK.

IMPROVEMENT IN LOW-WATER ALARMS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **220,262**, dated October 7, 1879; application filed July 21, 1879.

To all whom it may concern:

Be it known that I, JOHN F. THOMPSON, of the city of Troy, county of Rensselaer, and State of New York, have invented a new and useful Improvement in Low-Water Alarms for Steam-Boilers, of which the following is a specification.

The invention relates to automatic low-water alarms operated by the expansion of a metal tube, and consists in the means employed to prevent the operation of the same until the water in the boiler becomes reduced beyond the limits of safety, and in perfecting the construction of the device, and also in combining therewith the ordinary steam-gage, water-gage, and gage-cocks to render the working of the same more effectual and convenient.

In the accompanying drawing, Figure 1 shows an elevation, partly in section.

A represents a tubular column, of cast-iron or other suitable material, closed at top and bottom, so as to form a steam and water tight reservoir, which is connected with the boiler and held in a vertical position by two pipes or tubes, (not shown in the drawings,) one of which enters said boiler at or above the high-water line and the other at the extreme low-water line, freely admitting both steam and water to the column, making it a component part of the boiler aforesaid.

B B represent a vertical tube, of brass or some other expansive metals, rigidly secured to the bottom of the column A, being there provided with a stop-cock, C, and extending longitudinally through and some distance above said column, and passing out through the stuffing-box or nut D at top of same, and terminating in the cap E, which is formed with a short projection or lug, F, which is connected by means of the rod G with the cam or trip lever H, which, in turn, engages with the valve-stem I of the whistle K, which is connected by the steam-pipe L with the column A.

By M is represented the ordinary water-gage, and by N, N', and N'' the usual gage-cocks.

Surrounding the expansive tube B is the tube or jacket P, preferably of wrought-iron,

which is secured to the interior of the column A at the top of the same by means of the nut or stuffing-box D, and extends downward to a point about midway between the central and lower gage-cocks, N' and N'', respectively, where indicated by the dotted line X X, terminating with an open end, and being of sufficient diameter to allow a space or opening between the interior of the same and the exterior of the tube B aforesaid.

R represents an ordinary steam-gage, which is connected with the column A by the siphon S in the usual manner.

The operation of the device is as follows: When the water in boiler, and consequently in column A, becomes reduced to the line X X, the steam passes under and through the open end of the outer tube, P, filling the space between it and the inner tube, B, and also passes through several holes provided in said tube B at that point, filling the interior of the same, which causes it to expand longitudinally, and, through the agency of the rod G and cam H, to sound the alarm-whistle K, the steam being prevented from acting upon the expansive tube by the outer jacket until the water has been reduced, as aforesaid.

The stuffing-box D allows free expansion and contraction of said tube B without leakage.

The water-gage M, gage-cocks N, N', and N'', and steam-gage R may be used, respectively, for observing and trying the condition of steam and water in the column A.

The stop-cock C is used for blowing out the column A to clear it of sediment, elongated holes or slots being formed in the lower end of the tube B, as shown, to facilitate the operation.

What I claim is—

1. In low-water alarms or indicators, the combination of the combined stuffing-box and nut D with the jacket P, when said stuffing-box or nut D is so constructed and arranged as to prevent leakage where the expansive tube B emerges from the top of the column A, and to form a coupling or connection, by means of which said jacket P is secured to the interior of the column A afore-

said, substantially as shown and described, for the objects herein set forth.

2. In combination with the jacket P and stuffing-box D, the expansive tube B, provided with holes and slots and stop-cock C, and the cap E, lug F, rod G, cam H, valve-stem I, whistle K, water-gage M, gage-cocks

N, N', and N'', and steam-gage R, all constructed and operating substantially as shown and described, for the objects herein set forth.

JOHN F. THOMPSON.

Witnesses:

TIMOTHY HOLLAND,
H. LISLE FLEMING.