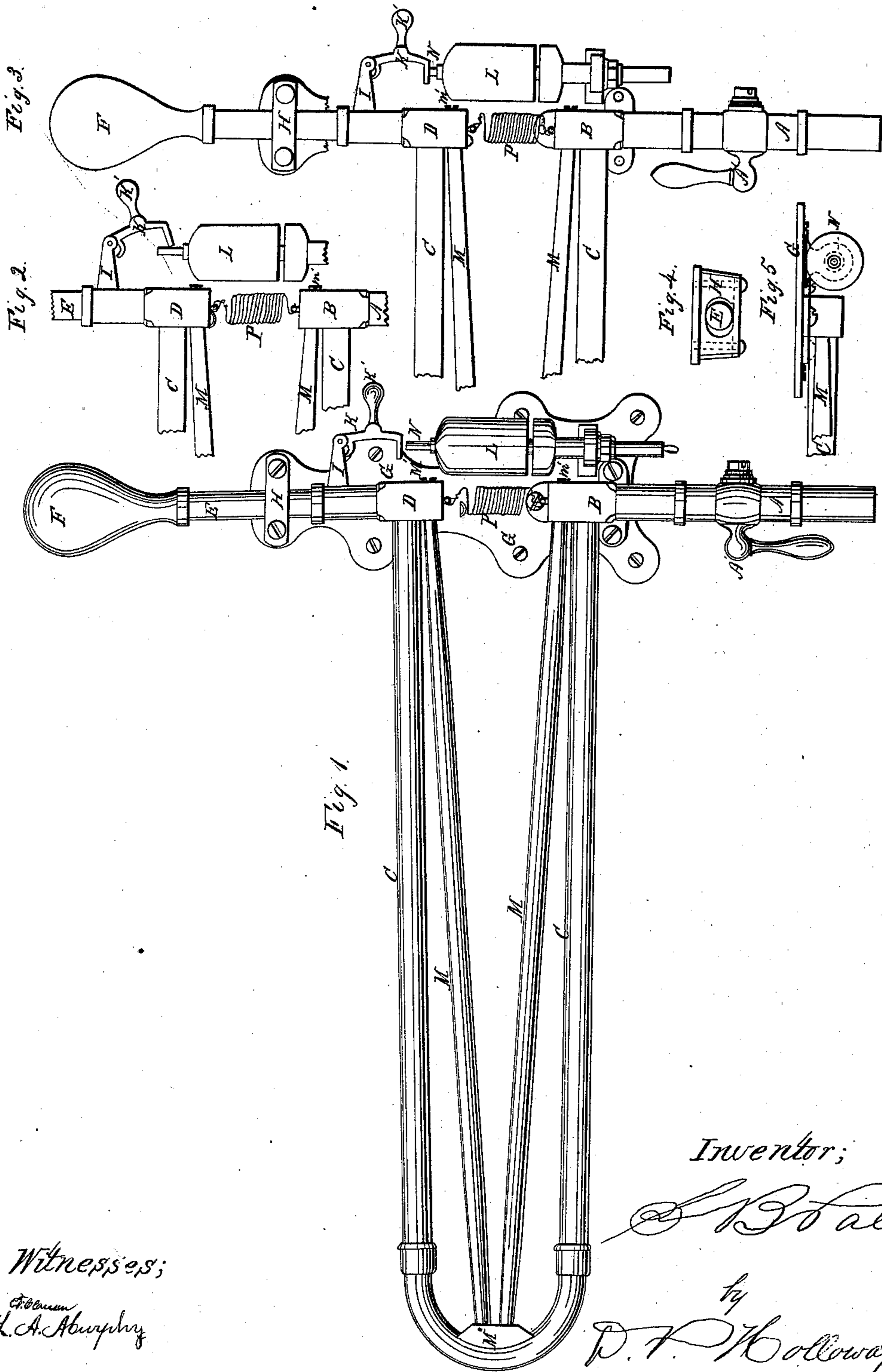


*S. B. Palmer,*  
*Steam-Boiler Indicator.*

*No 62,150.*

*Patented Feb. 19, 1867.*



*Witnesses;*  
*L. A. Aburphy*

*Inventor;*

*S. B. Palmer*

*by*  
*D. F. Holloway*

# United States Patent Office.

STEWART B. PALMER, OF SYRACUSE, NEW YORK.

*Letters Patent No. 62,150, dated February 19, 1867.*

## IMPROVEMENT IN LOW-WATER ALARM FOR STEAM GENERATORS.

*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, STEWART B. PALMER, of Syracuse, in the county of Onondaga, and State of New York, have invented a new and useful Alarm for Indicating the Failure of a Proper Supply of Water in Steam Generators; and I do declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation.

Figure 2 is a side elevation, showing the whistle-valve released, and the arms contracted.

Figure 3 is an elevator, showing the whistle in action.

Figure 4 is a plan of the yoke confining the upper pipe.

Figure 5 is a plan view of the whistle.

In the several figures the same letters are employed in the designation of identical parts.

My invention consists in a tube or series of tubes, in part of their length nearly horizontal, leading into the steam generator and terminating at the low-water line, so arranged that when the water is above the end of the tube the tube shall be filled with water, which, escaping on the fall of the water below the low-water line, will admit the steam into the tube, creating thereby an agitation which will produce a crackling noise sufficient to call attention to the state of water in the generator; second, in so arranging a tube or series of tubes opening at the low-water line of a steam generator that the expansion caused by the admission of the steam into the tube, on the escape of the water therefrom, when the water in the generator falls below its mouth, will actuate a steam whistle or other alarm by certain devices hereinafter set forth; third, in the particular arrangement of parts by which these results are attained.

The following description will enable a person skilled in the art to construct and apply my invention.

A is a pipe leading within the boiler and terminating at the low-water line. It is closed by the stop-cock A'. The elbow B on the end of said pipe receives the bent tube C, the arms of which are nearly horizontal, but inclined slightly in the direction in which the water will flow in returning towards the boiler. The form of this tube is not essential; it may be in one piece or in several pieces united by elbows. The upper end of the tube is connected with the elbow D, terminating in the pipe E, the upper end of which is in the air-chamber F. These several parts are attached by bolts to the plate G. The pipe E passes through a collar, H, the opening of which is large enough to permit the pipe to play back and forth with the movement of the tube C. When the steam is raised in the generator it will force the water into the series of connected pipes, compressing the air in the chamber F according to the degree of pressure. This water remaining stationary will assume the temperature of the adjacent atmosphere, and so remain unless the water in the generator falls below the low-water line, when it will instantly begin to flow out of the pipe and the steam to press in to occupy its place. This steam will pass over the surface of the water in the horizontal portions of pipe C, and by its condensation and the change in the temperature will produce a violent crackling noise, familiar in the pipes in buildings heated with steam, and sufficient under ordinary circumstances to call attention to the state of water in the generator. In cases where a louder alarm is necessary or advisable, I add to the parts already described the following: the pipe C is so bent that its tension inclines to bring together the elbows B and D, or a spiral spring, P, is placed between them, the tension of which draws them towards one another. They are held apart by the iron or steel brace-rods M, which rest against the bearing *m''*, at the other end against set-screws *m'* in the recesses in the elbows B and D. When the steam enters the pipe C, on the fall of water in the generator below the low-water line, the pipe becoming heated is expanded so that the brace-rods M will no longer rest against and retain in place the elbows B and D, which will be drawn together by the tension of the spring. The arm I projecting from the pipe E or elbow D suspends the hinged click K, which, with the descent of the elbow D presses upon and opens the valve N of the steam whistle L, to which the steam from the boiler enters at O. The whistle would continue to sound as long as the elbow D is drawn down, but it may be disengaged, as shown in fig. 2, allowing the valve stem to rise, and when the contraction of the pipe C has raised the elbow D sufficiently, the click will fall into its natural position, as shown in fig. 1, by the weight of the projecting ball *k'*.

An alarm bell or other device may be substituted for the steam whistle, as the particular kind of alarm forms no part of my invention, which relates to the devices for actuating an alarm, not to the alarm itself.

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

1. In combination with a steam generator, the pipes A, C, and E, connected and arranged to operate substantially as set forth.

2. In combination with the bent pipe C, and elbows B and D, I claim the rods M, substantially as and for the purpose set forth.

3. The combination of the arm I, attached to the elbow D or pipe E, click K, and valve stem N of the steam whistle L, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEWART B. PALMER.

Witnesses:

M. H. WESTCOTT,

J. HUNT.