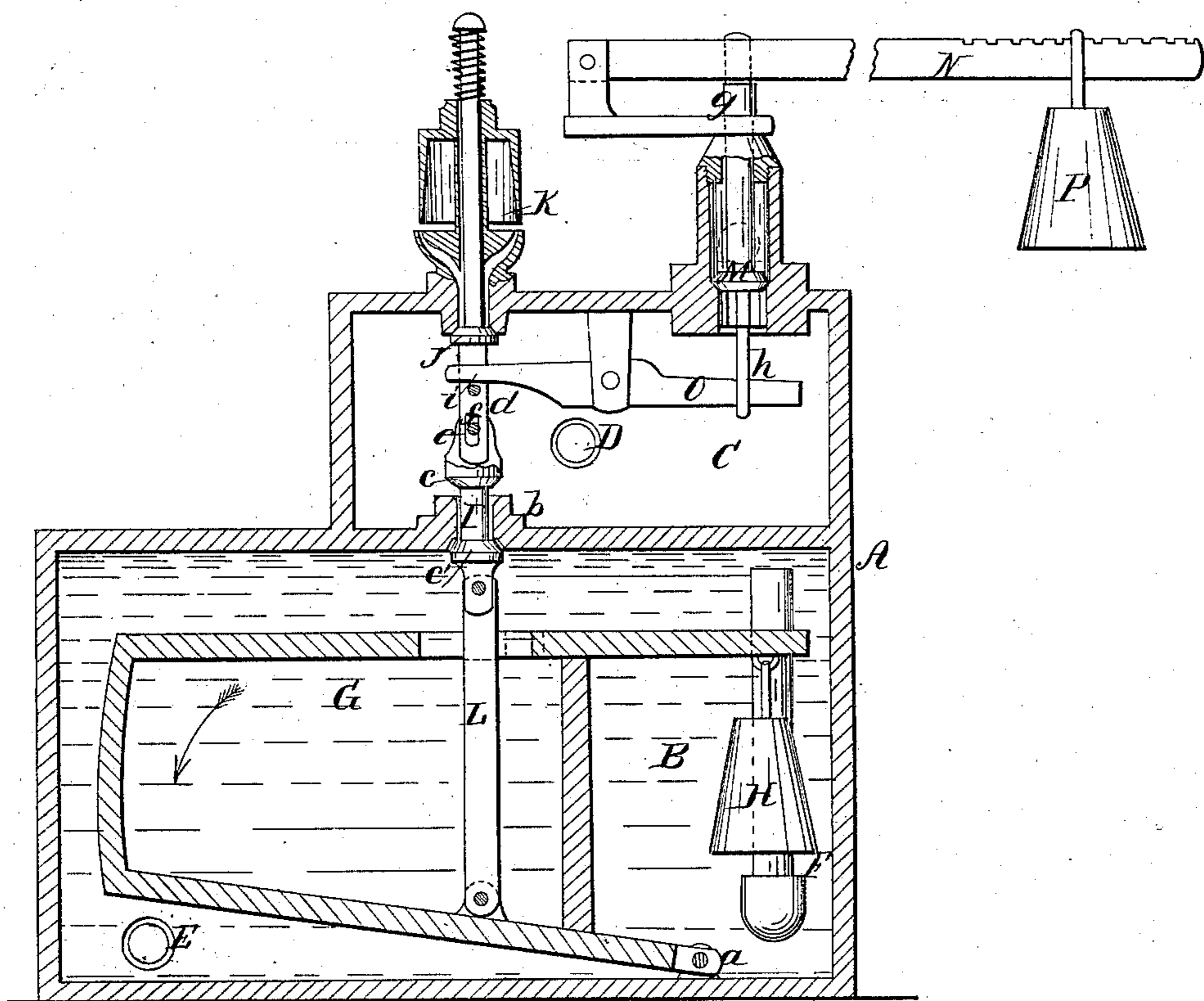


D. McFarland,
Steam-Boiler Indicator.
No 79,673. Patented July 7, 1868.



Witnesses;
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United States Patent Office.

DAVID McFARLAND, OF NEW YORK, N. Y., ASSIGNOR TO JOHN JOHNSON^T,
OF SAME PLACE.

Letters Patent No. 79,673, dated July 7, 1868.

IMPROVEMENT IN LOW-WATER DETECTOR AND STEAM-PRESSURE ALARM.

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, DAVID McFARLAND, of the city, county, and State of New York, have invented a new and useful Low-Water Detector and Steam-Pressure Alarm; 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 drawing, forming a part of this specification.

This invention relates to a new and simple device to be connected with a steam-boiler for sounding an alarm when the steam within the boiler exceeds a certain pressure, and also for sounding an alarm when the water descends to a certain level.

In the accompanying drawing an elevation of my invention is shown, the side of the box or case nearest the eye being removed.

A represents a box or case having two compartments, B C, B being placed below the other, C, and B considerably larger than C, as shown clearly in the drawing.

The upper and smaller compartment, C, communicates, by means of a pipe, D, with the steam-boiler above the level of the water therein, and the lower and larger compartment, B, communicates with the steam-boiler below the water-level, by means of pipes E F, the pipe E communicating with B near its bottom, while F communicates with it somewhat higher up, and extends upward in B to within a short distance of its top, as shown in the drawing.

Within the compartment B there is placed a box, G, which is fitted on a rod or shaft, *a*, at the bottom of B, and is counterpoised by a weight, H, when the compartment B is filled with water from the boiler. This box G has openings in its top, one or more, so that it will be filled when B is filled; the box G having no discharge-apertures, as it is designed to have it contain water permanently.

I is a sliding rod, which passes through a stuffing-box, *b*, in the partition between B and C, and has shoulders, *c c'*, upon it, to limit its movement; and J is the valve of a steam-whistle, K, the stem *d* of said valve being connected to the rod I by a pin, *e*, which passes through an oblong slot, *f*, in the stem *d*, and admits of a certain length of movement of the stem independent of the rod I, as will be fully understood by referring to the drawing.

The lower end of the rod I is pivoted to a bar, L, the lower end of which is pivoted to the upper surface of the bottom of the box G.

M represents an ordinary safety-valve, N being the loaded beam, which bears upon the upper end of the valve-stem *g*. The valve M has a pendent loop, *h*, attached, through which one end of a lever, O, in the compartment C, passes, the opposite end of said lever bearing upon a pin, *i*, which passes through the stem *d*.

The operation is as follows:

The compartment B, where the pipe E is below the water-level in the boiler, is filled with water, and the box G is also filled with water from B, and the buoyancy of the box, in connection with the weight H, causes the box to remain in a state of equipoise so long as B remains filled with water. The box G, while thus equi-poised, keeps the valve J of the steam-whistle K in a closed state, as will be fully understood by referring to the drawing.

The compartment C is, of course, filled with steam from the boiler, and by adjusting the weight P on the beam N according to the steam-pressure required in the boiler, the valve M will not be raised by the pressure of steam in C until the required pressure is exceeded, and when this occurs, and the valve M is raised, the lever O is at the same time actuated, the stem *d*, and consequently the valve J, are forced down, and the whistle or alarm sounded.

This movement of the valve J of the whistle, independent of the rod I, is allowed in consequence of the pin *e*, which connects the stem *d* to rod I, passing through the oblong slot *f* in *d*.

Thus it will be seen that whenever the steam-pressure in the boiler exceeds the required standard, the whistle or alarm will be sounded simultaneously with the opening of the safety-valve.

The evaporation of the water in the boiler below the proper level is indicated as follows: As before stated, when the lower orifice of pipe F is below the water-level in the boiler, (the other pipe, E, always being below it,) the compartment B will be filled with water, owing to the pressure of the steam on the surface of the water in the boiler, and the box G will be in a state of equipoise, and the whistle or alarm-valve J kept closed. When, however, the water in the boiler descends below the lower orifice of pipe F, the steam will rush up through the latter into compartment B, and the water in B immediately descends, passing through E into the boiler until the water-level in boiler is reached, when B will be nearly or quite emptied.

The box G will then, owing to the absence of the buoyant power of the water, tilt in the direction indicated by the arrow, and in so doing draw down or open the valve J, and the whistle or alarm will be sounded.

As the boiler is replenished with water, the compartment B will be again filled, and the box G buoyed up to close the valve J and keep it in a closed state.

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

1. The tilting-box G, fitted within a compartment, B, which communicates with the steam-boiler below the water-level by pipes E F, and is connected with the valve J of a steam-whistle or alarm, K, all arranged to operate in the manner substantially as and for the purpose described.

2. The safety-valve M, connected with the valve J of the steam-whistle or alarm by means of the lever O and the stem d of valve J, arranged within a steam-compartment, C, as shown, to admit of a movement of said valve independent of the rod I and box G, and the simultaneous opening of the safety-valve M and whistle or alarm-valve J, when the steam within the boiler exceeds a certain desired pressure.

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Witnesses:

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