M. S. VOSBURGH.

Low-Water Detectors for Steam-Boilers.

No. 134,499. Patented Dec. 31, 1872.

Fig. I

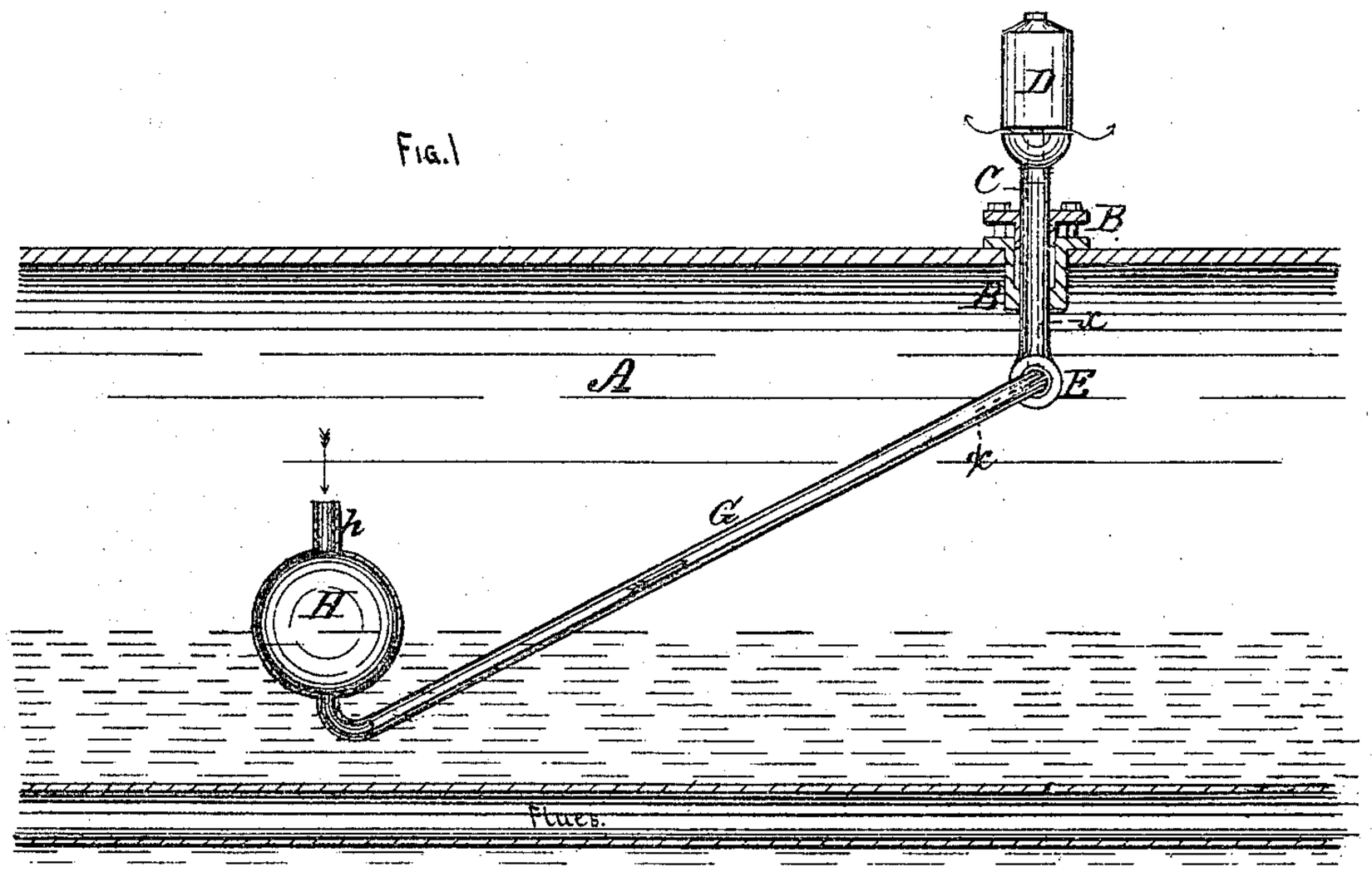


Fig. II

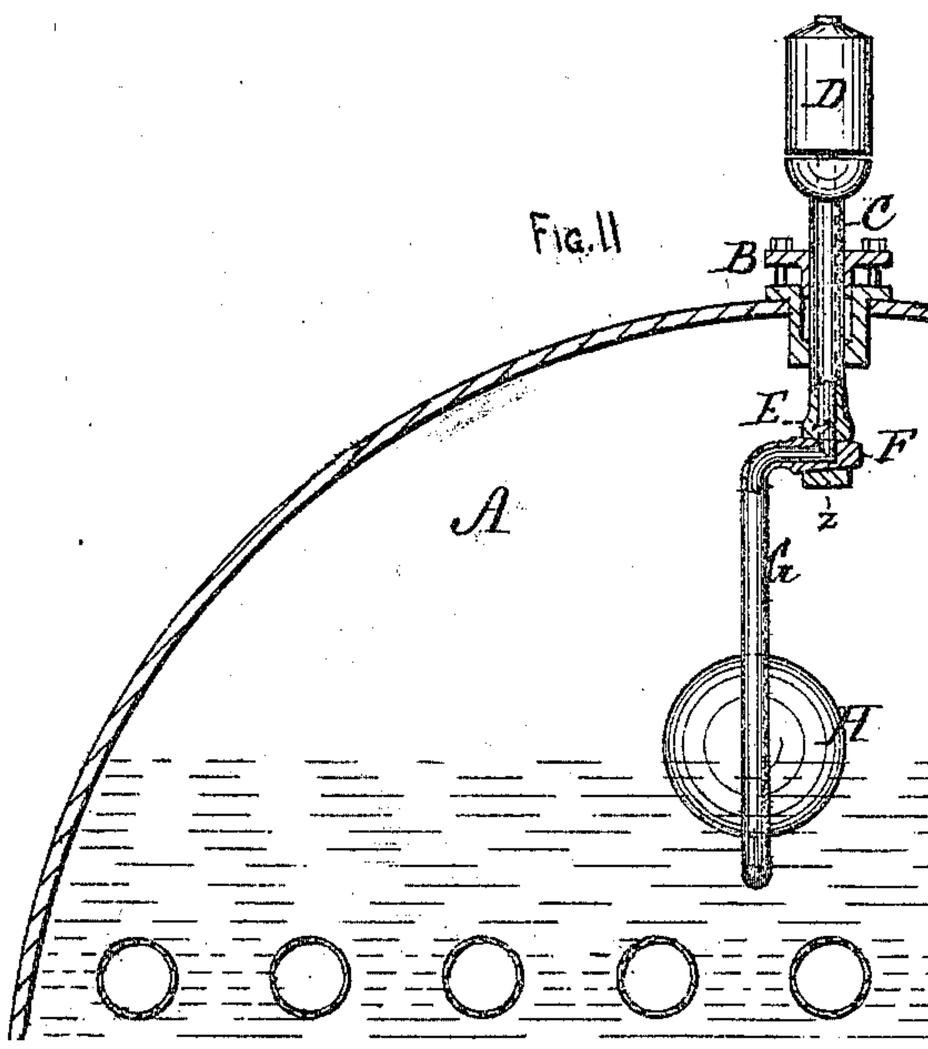
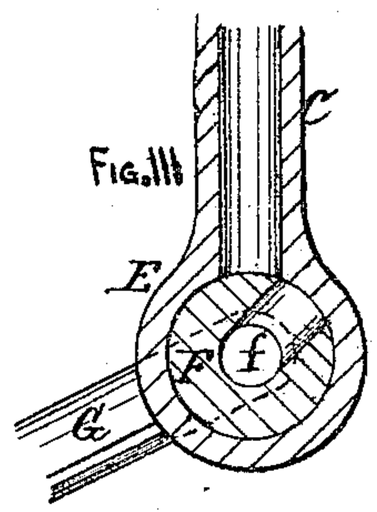


Fig. III



Witnesses.

F. L. Gardner

John R. Young

Inventor

M. S. Vosburgh, by

Prindle and Co., his Attys

UNITED STATES PATENT OFFICE.

MARTIN S. VOSBURGH, OF ATTICA, NEW YORK.

IMPROVEMENT IN LOW-WATER DETECTORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **134,499**, dated December 31, 1872.

To all whom it may concern:

Be it known that I, MARTIN S. VOSBURGH, of Attica, in the county of Wyoming and in the State of New York, have invented certain new and useful Improvements in Low-Water Detectors; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a vertical longitudinal section of a boiler containing my improved apparatus; Fig. 2 is a cross-section of the same with a portion of said apparatus removed upon line *x x* of Fig. 1; and Fig. 3 is an enlarged section of the connecting-cock on line *z z* of Fig. 2.

Letters of like name and kind refer to like parts in each of the figures.

In the use of low-water signals in which the apparatus is operated by means of a float that rests upon and rises and falls with the water it is found that the float soon becomes waterlogged and useless, when made of wood or other porous material, while if made of metal and filled with air the pressure within the boiler soon causes it to collapse, or, by forcing water into its interior, destroys its buoyancy and usefulness.

To remedy this difficulty is the main object of my invention; and it consists principally in a low-water alarm for steam-boilers, a hollow float provided at its upper side with an opening which commnnicates at all times with the steam-space, and at its lower side with an opening placed in communication with the open air, when said float is connected with suitable operative mechanism and so arranged that the weight of water leaking or dashing into its interior shall operate said mechanism and cause said water to be automatically discharged into the open air, substantially as and for the purpose hereinafter specified. It consists, further, in the device as a whole, when constructed and arranged substantially as and for the purpose hereinafter set forth.

In the annexed drawing, A represents a boiler provided at its upper side with an opening in which is placed a stuffing-box, B, of usual construction. Passing downward through the stuffing-box B is a pipe, C, upon the upper end of which is secured a steam-whistle, D, while upon its lower end is attached the barrel E of an ordinary cock. The plug F of the cock E is provided with an opening, *f*, which extends longitudinally inward from its largest end to a point in a line with the center of the pipe C and from thence passes radially outward, as shown in Figs. 2 and 3. Attached to or upon the large end of the plug F is a pipe, G, which, making a short curve, extends outward and downward in a line at a right angle to said plug, and at its opposite end curves upward, and has attached thereto a hollow spherical ball or float, H, constructed of or from thin sheet metal, and provided at its upper side with a short pipe, *h*. The relative positions of the pipe G and the radial opening *f* within the plug being arranged so as to cause said opening to come opposite to the solid portion of its barrel when the float rests upon the water and the latter has the desired height within the boiler and to overlap the opening *e* within said barrel when said water falls below the level required, the device is complete, and operates as follows:

As the water falls within the boiler the float moving with it turns the plug and opens communication (through the pipes C, G, and *h*, and the float) between the interior of the boiler and the whistle, and by means of the escaping steam causes the latter to sound a sufficient alarm to attract the attention of the attendant. Upon forcing water into the boiler so as to raise the level of that contained therein the float is raised, and, by turning the plug in an opposite direction, closes the passage through the cock and arrests the alarm.

In the event of the entrance of water to the interior of the float, either by leakage or from foaming, its weight will cause said float to sink until the cock is opened, when the pressure of the steam operating through the pipe *h* will cause said water to be instantly expelled through the pipe C, by which means the buoyancy of said float will be restored, and, rising upon the water, it will close the cock once more.

When it is desired to vary the height of water at which the alarm will sound, the pipe C is raised or lowered within its stuffing-box, the change in the alarm level of the water being exactly equal to the elevation or depression of said pipe.

By means of the hereinbefore-described con-

struction the durability of the float is insured, the pressure within and without being equal, and all liability to derangement from leakage or foaming is avoided, while as a whole the device is effective and certain in its operation, and, from the simplicity of its parts, can be furnished at a comparatively low cost.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In a low-water alarm for steam-boilers, a hollow float provided at its upper side with an opening which communicates at all times with the steam-space, and at its lower side with an opening placed in communication with the open air, when said float is connected with suitable operative mechanism, and so arranged that the weight of water leaking or dashing into its interior shall operate said mechanism and cause said water to be automatically discharged into the open air, substantially as and for the purpose specified.

2. The pipes C, G, and *h*, the whistle D, the cock E and F, and the float H, when constructed, as shown, and combined with each other and with the boiler A, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of November, 1872.

M. S. VOSBURGH.

Witnesses:
GEO. S. PRINDLE,
EDM. F. BROWN.