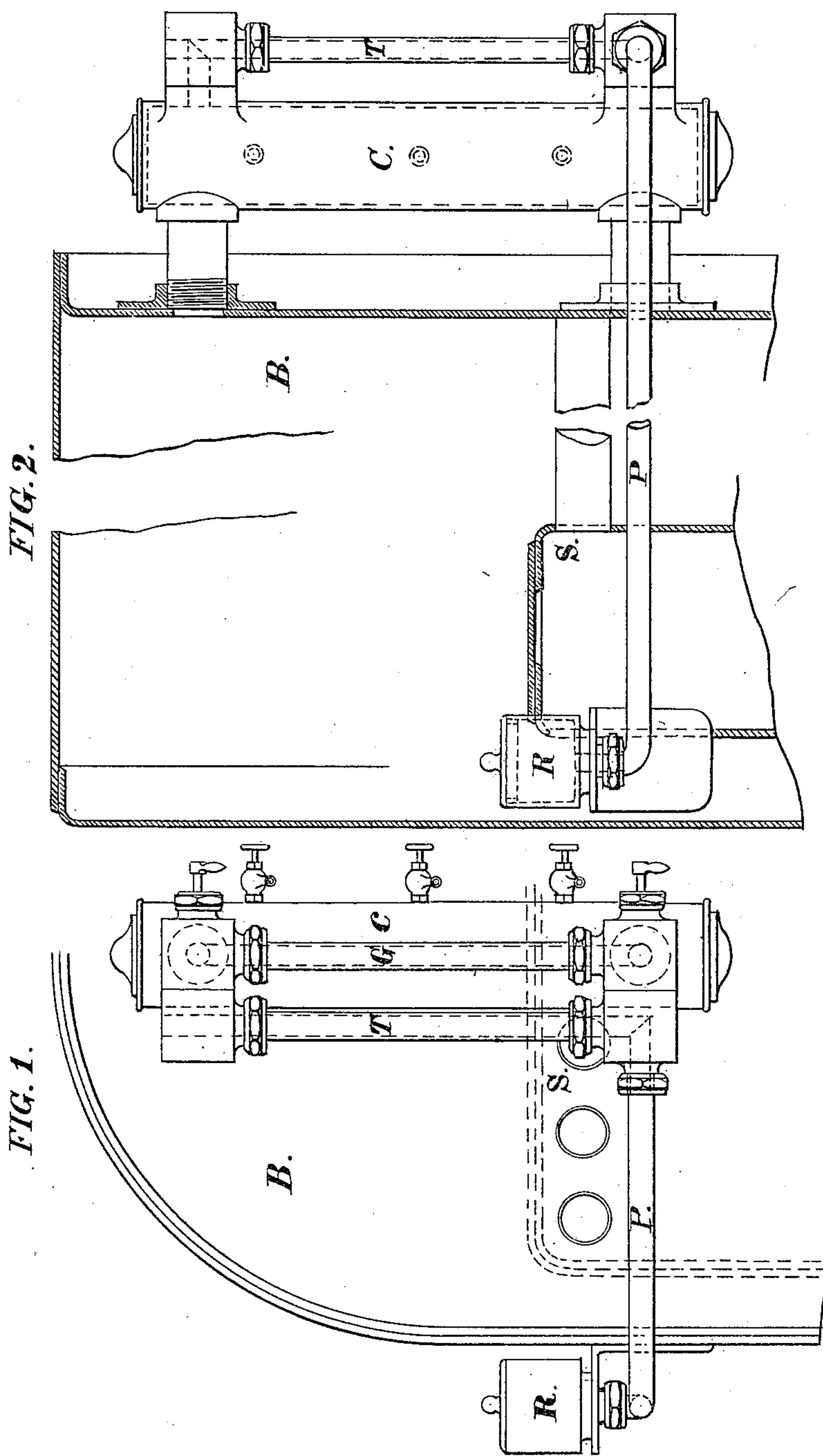


A. H. ABLE.
Water Gage for Marine Boilers.

No. 230,849.

Patented Aug. 10, 1880.



WITNESSES:

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AUGUSTUS H. ABLE, OF PHILADELPHIA, PENNSYLVANIA.

WATER-GAGE FOR MARINE BOILERS.

SPECIFICATION forming part of Letters Patent No. 230,849, dated August 10, 1880.

Application filed February 18, 1880.

To all whom it may concern:

Be it known that I, AUGUSTUS HENRY ABLE, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Water-Gages for Marine Boilers, of which the following is a specification.

My invention relates to a reservoir or cup for holding a fluid communicating with a glass tube-gage for indicating the height of the highest heating or fire surface of a marine boiler when a ship has a list or is heeled over under a press of canvas. This gage is to be used in combination with the glass water-gages now in common use on marine boilers.

Heretofore an ordinary glass tube has been used to indicate the height of the water in marine boilers. When a steamship is heeled over or deviates from her upright position the heating-surfaces of her boilers assume a position due to the heel of the ship, while the surface of the water within them remains parallel to the horizon. Under these conditions the outboard heating-surfaces of the boilers on the "weather side" is raised and has less water over them than when the ship is on an even keel. The "water-tender," being anxious to keep his heating-surface well covered with water, puts on the "feed," but has nothing to guide him except his judgment as to the height of the water required, and to be on the safe side frequently carries the water higher in the boiler than is necessary, causing the boilers to foam and carry water over into the cylinder of the engines and endangering their safety.

The object of my invention is to provide a glass gage by which the relative position of the highest heating-surface and the height of the water-level within the boiler may be seen at a glance.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a view embodying my invention, and Fig. 2 is a side elevation.

G shows a glass water-gage connected with the water-gage-cock cylinder C, attached to the front of the boiler B. The glass water-gage G and the water-gage-cock cylinder C are in communication with the water and steam space of the boiler B, and show the height of the water-level within it, and are such as are now in general use for that purpose.

T is a glass tube placed adjacent to G or on

a level with it. The upper end of the glass tube T is open to the atmosphere, and the lower end communicates through the small pipe P with the reservoir or cup R, to be filled with either mercury or oil or some other suitable fluid. The reservoir or cup R is placed outside of the boiler, at the outboard end, at the height of the highest heating-surface S.

The reservoir or cup R is so proportioned that the area of its cross-section will be greatly in excess of the area of the cross-section of the bore of the glass tube T, the bore of which may be made as small as one-eighth ($\frac{1}{8}$) of one inch in diameter.

The operation of the device is as follows: The reservoir or cup R being filled with mercury, oil, or some other suitable fluid to the height it is desired to maintain the water over the highest heating-surface S, when the ship heels the reservoir or cup R is carried up with the outboard end of the boilers on the weather side. The area of the cross-section of the reservoir or cup R being so much greater than the area of the cross-section of the glass tube T, the liquid will rise and fall in the glass tube T and reservoir or cup R in an inverse ratio of the area of their respective cross-sections, thus making but a little fall of the fluid in the reservoir or cup R, while it rises to the maximum height in the glass tube T.

The level of the fluid in the reservoir or cup R with reference to the highest heating-surface S being practically constant, and the height of the fluid in the glass tube T being on a level with the fluid in the reservoir or cup R, it furnishes a true guide for the height of the water to be maintained in the glass water-gage G communicating with the steam and water space of the boiler B.

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

The reservoir or cup R for holding a fluid, communicating through the pipe P with the glass tube T, placed adjacent or on a level with and to be used in combination with the glass water-gage G, communicating with the water and steam space of the boiler B, as substantially set forth.

A. H. ABLE. [L. S.]

Witnesses:

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