A. H. ANTHONY.

FLOAT VALVE.

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1,287,174.

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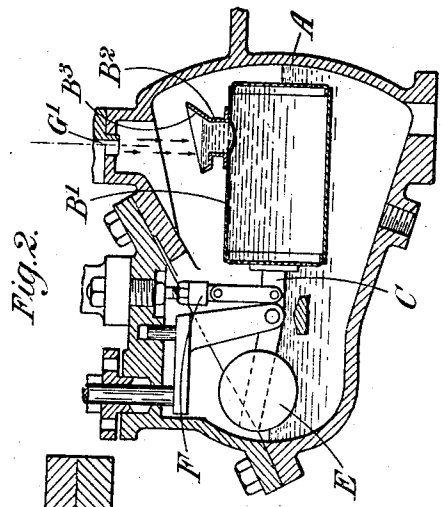


Fig. 2.

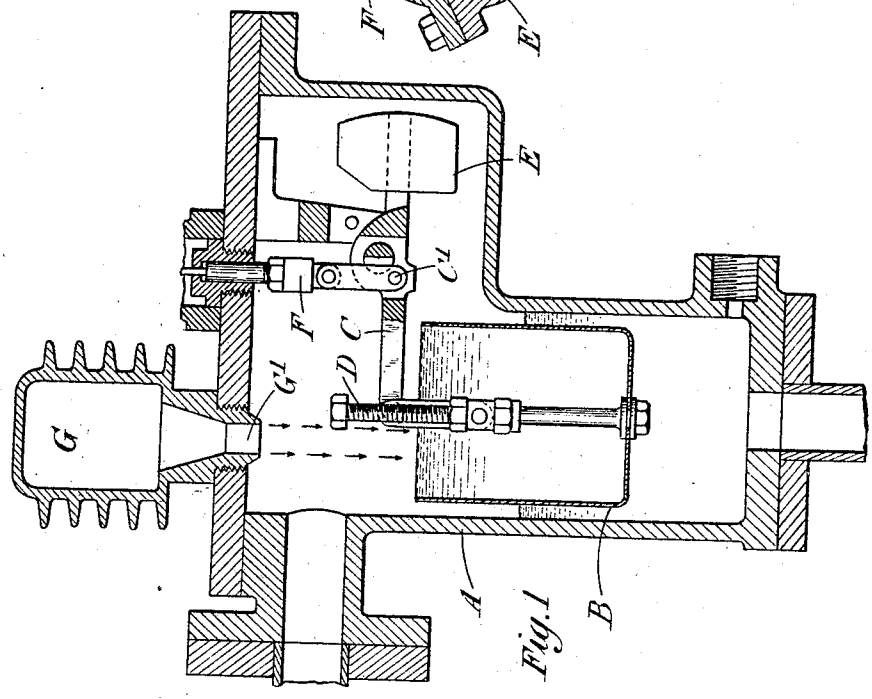


Fig. 1.

Witnesses

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FLOAT-VALVE.

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To all whom it may concern:

Be it known that I, ALFRED HYMAN ANTHONY, a subject of the King of England, and a resident of Colchester, Essex, England, have invented certain new and useful Improvements in Float-Valves, of which the following is a specification.

This invention relates to boiler-feed float apparatus of the kind in which a float buoyed up by water and exposed to the steam at boiler pressure in a vessel, is arranged to operate or control some device automatically by variation of the level of the liquid in the vessel, which said device determines the feed to the boiler.

Difficulty has arisen heretofore, when apparatus of this type is exposed to the high temperature and pressure of a steam boiler, owing to such floats becoming sooner or later water-logged. The consequent loss of buoyancy destroys the adjustment upon which their proper functioning depends, whether the water-logging be complete or partial.

The object of the present invention is to avoid the trouble arising from water-logging by employing, in the type of apparatus referred to, an open float, that is to say, a bucket-like or open-mouthed float. An open float is not broadly new, particularly in steam traps, but the present invention is limited to the use of an open float for boiler feed apparatus in which the float is only partly, never completely, submerged, and needs to respond to such small changes of level as are permissible in best marine practice—for example, a change of, say, half an inch.

According to the present invention, in float apparatus of the kind defined, an open and partly balanced unsubmerged float is combined with means to condense some steam from the boiler and automatically deliver it as water continuously, or with regularity into the open and unsubmerged mouth of the float.

This invention provides, moreover, a construction of the said open-mouthed float in which the mouth is made wide; the object in providing this wide mouth is to enable the float, when employed to control the feed of a marine boiler, to spill some of its liquid contents when the ship is rolling heavily. By this means the float becomes more buoyant and cuts off the feed supply when the water level is lower than would be the case if the float were fully charged with liquid. The level of water in the boiler thus, when the ship is in a heavy sea-way, is automatically kept slightly lower than it is when the ship is steady.

Where the result just above described, as obtained by spilling part of the liquid content of the float, is undesired, this invention provides a container with a trunk for the purpose of keeping the container full of liquid and confining variations of the level of the liquid in the container to the trunk itself.

In the accompanying drawings—

Figure 1 is a vertical central section through a vessel fitted with a float-device according to this invention for controlling the supply of feed-water to a boiler, and

Fig. 2 is a similar view of an alternative construction.

A vessel A, as seen in Fig. 1, is provided to constitute the float chamber and contains a float B suspended upon a lever C pivoted at C^1. The float consists of an open bucket with parallel sides secured to one end of the lever C by an adjusting screw D by which its distance from the lever may be adjusted and finally fixed. At the other end of the lever is a balance weight E, and an arm F connects the lever to a valve which serves to control the feed to the boiler, the connections being such that when the float end of the lever is depressed feed water is admitted to the boiler and when that end rises the feed is cut off.

The bucket B is pivotally suspended from the arm C so that its mouth automatically remains horizontal. Above the bucket is a condenser G secured in the roof of the chamber A, the condenser being in the form of a domed vessel, whose mouth G^1 is downwardly directed and communicates with the interior of the chamber A. The condenser is provided with radiating gills so as to be sufficiently air-cooled to condense steam which passes into it. The mouth G^1 of the condenser is so placed that the condensed steam drips from the condenser into the bucket. The bucket, the proportions of the pivoted lever, and the counter-balance, are so chosen that the bucket when full of water is balanced by its counter-weight when it is about half immersed. It is normally kept full by the drip of condensed steam from the condenser, but in a heavy sea-way the bucket will spill some of its liquid content

and will therefore be balanced by the counter-weight when it is less immersed than normally, and will thus keep the level of water in the boiler slightly lower than ordinarily. The counter-weight is preferably not immersed.

Where the above-described action in which the bucket spills some of its water in a heavy sea-way, is not desired the construction shown in Fig. 2 may be adopted. In this construction the bucket or container B, which constitutes the float, is covered in with a water-tight cover B^1 provided, however, with a trunk B^2 rising vertically from it. The trunk B^2 is of small diameter compared with the diameter of the bucket and is provided with a flared mouth B^3, having the upper edge of its wall sloping, that is to say inclined, to a horizontal line. The bucket in this construction is not pivotally secured to the lever C carrying the counter-weight, but is rigidly secured thereto. If used for a marine boiler, this float or bucket will not be subject to such variation in its action from spilling in a heavy sea-way as will that described with reference to Fig. 1. The effect of the trunk and mouth is to restrict the variation more than if the bucket had a wide mouth.

A special condenser may be dispensed with if a long steam pipe be employed to the float-chamber and its inlet so arranged that the condensation within the pipe drips into the float. Instead of an air-cooled, a water-cooled condenser may be employed and the cooling may conveniently be effected, when the feed is controlled in the well-known manner by a device which depends upon the leakage of water past a balancing piston, by using this leakage water as the cooling water for the float condenser.

Obviously, the open-bucket type will serve for land purposes, and since it is cheaper than the type that is closed and provided with a trunk, the open type is to be preferred for land work.

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

1. In a float-valve for boiler feed apparatus in which the float is exposed to steam at boiler pressure, the combination of an open float so mounted and partly balanced as to be always partly immersed but never completely submerged, of means to condense steam from the boiler and deliver it automatically as water into the said open float.

2. In a float-valve for boiler feed apparatus in which the float is exposed to steam at boiler pressure, the combination of an open float so mounted and partly balanced as to be always partly immersed but never completely submerged of a chamber provided with radiating gills and closed except for a downwardly directed mouth opening into the float-containing chamber at a point over the mouth of the float, substantially as set forth.

3. In a float-valve for boiler feed apparatus in which the float is exposed to steam at boiler pressure, the combination with a cylindrical bucket constituting the float so mounted and partly balanced as to be always partly immersed but never completely submerged, of means to continuously condense steam from the boiler and deliver the water of condensation into the said open float, substantially as set forth.

4. A boiler feed device comprising a chamber, a connection between the water space of the boiler and said chamber, a second connection between the chamber and the steam space of the boiler, a pivotal float member mounted in the chamber partially balanced so as to always be partly immersed but never completely submerged, and a steam condenser connected to said chamber above the open mouth of the float, the mouth of the condenser being immediately above the mouth of the float to deliver the water of condensation from the condenser to the float; substantially as described.

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

ALFRED HYMAN ANTHONY.

Witnesses:

S. T. Rodgers,

Harold H. Simmons.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."