No. 895,817. PATENTED AUG. 11, 1908.

H. D. TWOMBLY.

AUTOMATIC BOILER FEED.

APPLICATION FILED SEPT. 17, 1907.

Fig. 1.

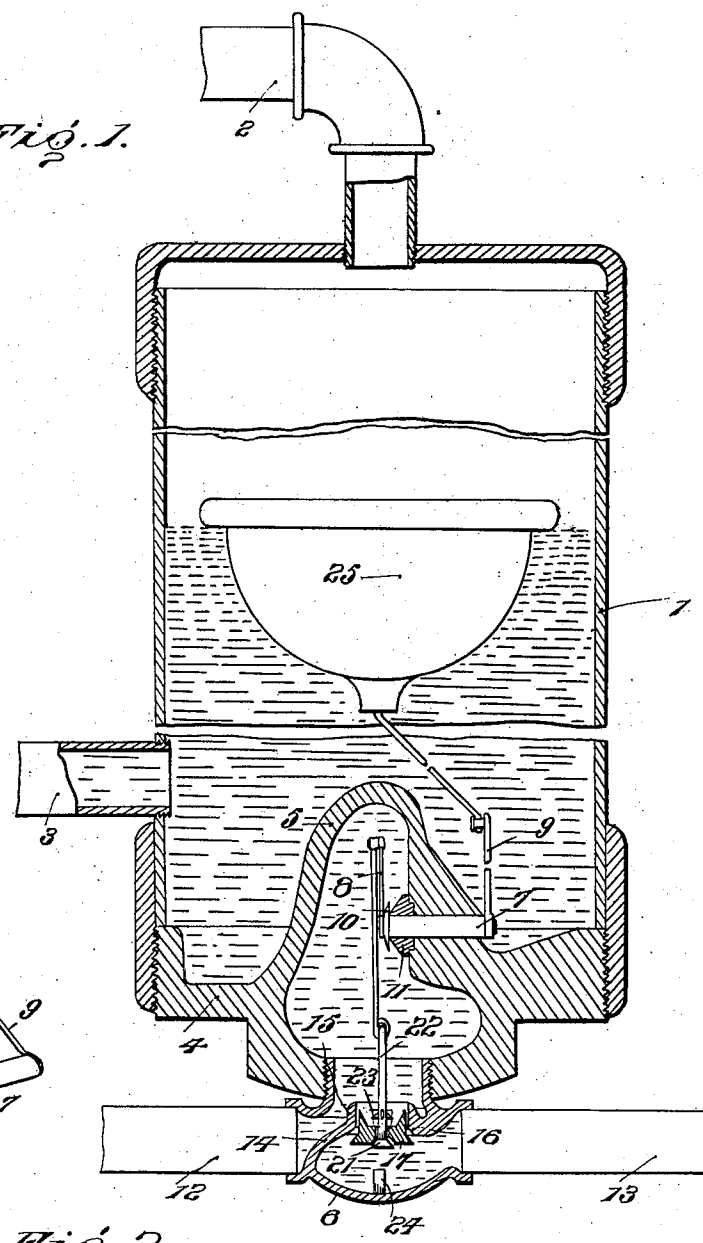
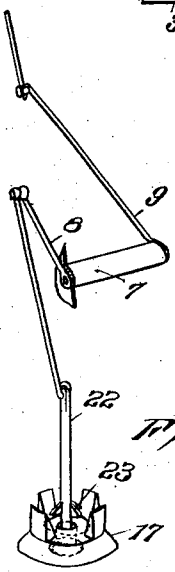


Fig. 2.



Witnesses

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AUTOMATIC BOILER-FEED.

No. 895,817. Specification of Letters Patent. Patented Aug. 11, 1908.

Application filed September 17, 1907. Serial No. 393,297.

To all whom it may concern:

Be it known that I, HARRY DENNY TWOMBLY, citizen of the United States, residing at Sourlake, in the county of Hardin and State of Texas, have invented certain new and useful Improvements in Automatic Boiler-Feeds, of which the following is a specification.

This invention appertains to means for supplying steam boilers with water so as to prevent either over-feeding or deficiency in supply with dangerous results, the means being automatic and controlled solely by the change of level of the water in the boiler.

The feeder comprises in its organization a cylinder or receptacle having connection at different levels with, respectively, the steam space and the water space of the boiler, a float arranged within the cylinder or receptacle and controlled by the change of level of the water therein, and a valve mechanism actuated by movements of the float to control the supply of water to the boiler as the exigency may require, according to the movement of the float.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical sectional view of the boiler feeder embodying the invention, the float and valve being in full lines; and, Fig. 2 is a detail view in perspective of the valve and adjunctive parts.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The cylinder or receptacle 1 may be of any capacity, construction and shape, and is adapted to have its upper portion connected to the steam space of the boiler by means of a pipe 2 and its lower portion connected with the water space of the boiler by means of a pipe 3. A base 4 fitted to the lower end of the cylinder or receptacle 1 is provided with a chamber 5 and a valve casing 6, the two being preferably separately formed and connected by means of screw threads. A rock shaft 7 is fitted in one wall of the chamber 5 and is provided at opposite ends with arms 8 and 9, the latter being arranged to operate in the cylinder or receptacle 1 and the arm 8 located within the chamber 5 and being considerably shorter than the arm 9. The rock shaft 7, in addition to its rotary movements, is adapted to have a limited longitudinal movement and is provided at or near one end with a valve or outer flange 10 adapted to obtain a bearing against a seat 11 fitted in a recess of the wall in which the rock shaft 7 is mounted. Pressure within the chamber 5 serves to hold the valve 10 in contact with the seat 11 so as to prevent escaping of any fluid from the chamber 5 into the cylinder 1.

The valve casing 6 is provided with opposite coupling ends to which pipes 12 and 13 are attached, the pipe 12 having connection with the water space of the boiler to be fed, and the pipe 13 leading from a pump or other means for supplying water under pressure to be introduced into the boiler. The valve casing 6 is provided with the usual inner diaphragm or partition 14 having a central opening surrounded by a tubular extension 15 provided at one end with a valve seat 16. A valve 17 is adapted to close upward against the seat 16 and is provided with lugs 18 forming guides arranged to operate in the tubular extension 15 so as to guide the valve 17 in its reciprocating movements. The valve 17 is provided with a central opening 19 having a valve seat 20 at its lower end for coöperation with a valve 21 adapted to or carried by a stem 22 arranged to operate in the opening 19 and provided a short distance from the valve 21 with lugs 23 forming stops to limit the downward movement of the valve 21 and to engage with the valve 17 and effect unseating thereof in the continued descent of the float as the valve of the water in the boiler and in the cylinder or receptacle 1 descends. A stop 24 projected upward from the bottom of the valve casing 6 is adapted to limit the unseating or downward movement of the valves 21 and 17.

A float 25 arranged within the cylinder or receptacle 1 is connected by means of a link 26 with the arm 9 so as to effect a rocking of the shaft 7 and a reciprocating movement of the valves 21 and 17 as the float rises and falls incident to the change of level of water in the boiler and cylinder. The several parts are so proportioned and arranged that when the device is coupled to a boiler to be fed thereby and when the level of the water is at a given point, the valves 17 and 21 are closed. It is to be understood that the level of the water in the boiler and in the cylinder or receptacle 1 is the same, as the water level

lowers by reason of the consumption of the water, the float 25 correspondingly descends or lowers and causes the shaft 7 to rock, with the result that the stem 22 is pushed downward and opens the valve 21, and a short while thereafter unseats the valve 17 by the stops 23 coming in contact with said valve. When the valve 17 is unseated, the water from the pump or other source of supply passes through pipe 13, valve casing 6, and pipe 12 into the boiler, and when the level of the water in the boiler is established, the float 25 rises and causes rotation of the shaft 7 in an opposite direction, with the result that the stem 22 is moved upward and effects a seating of the valves 21 and 17, thereby shutting off the supply of water to the boiler.

The valve 21 acts in the capacity of a pilot or equalizer, and being of comparatively small area is readily opened against pressure from the pipe 13 so that water may pass from the pipe 13 into the chamber 15 and thereby equalize the pressure upon both sides of the valve 17, thereby admitting of said valve 17 opening readily upon a continued descent of the float 25. If the valve 21 were not provided, the float would necessarily have to overcome the pressure of the water against the valve 17 and this would necessitate the provision of a float of comparatively large displacement. The provision of the pilot or equalizing valve 21 enables a float of comparatively small displacement to be successfully employed with the result that the device is of compact arrangement and enables it to be located in a comparatively small space.

Having thus described the invention, what is claimed as new is:

1. In combination, a receptacle provided with an isolated chamber and a valve casing in connection with said chamber, a rock shaft mounted in a wall of the chamber and extending through said wall, a valve at or near the end of the rock shaft extended into the said chamber and adapted to close against a seat provided upon the wall in which said rock shaft is mounted, a float arranged to operate in said receptacle and having connection with the opposite end of the rock shaft, and a valve arranged in the valve casing and having connection with the opposite end of said rock shaft, the connecting means being located in the aforementioned chamber.

2. In combination, a receptacle provided at its lower end with a base having a chamber and a valve casing, said receptacle being designed for connection with, respectively, the water and steam spaces of a boiler, a rock shaft mounted in the wall of said chamber and provided with a valve to close against a seat applied to said wall and surrounding the opening in which the rock shaft is mounted, arms projecting from opposite ends of the rock shaft, the one extending into the receptacle and the other into said chamber, the arm arranged to operate in the receptacle being longer than the arm located in the said chamber, a float located within the receptacle and having connection with the long arm of the rock shaft, a main valve adapted to close against a seat provided within said valve casing and having an opening therethrough, an equalizing valve for closing the opening of the main valve, a stem projected from the equalizing valve and provided with a stop, and connecting means between said valve stem and the short arm of the rock shaft.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY DENNY TWOMBLY. [L. S.]

Witnesses:

J. E. MURRAY,

M. M. TWOMBLY.