

No. 699,150.

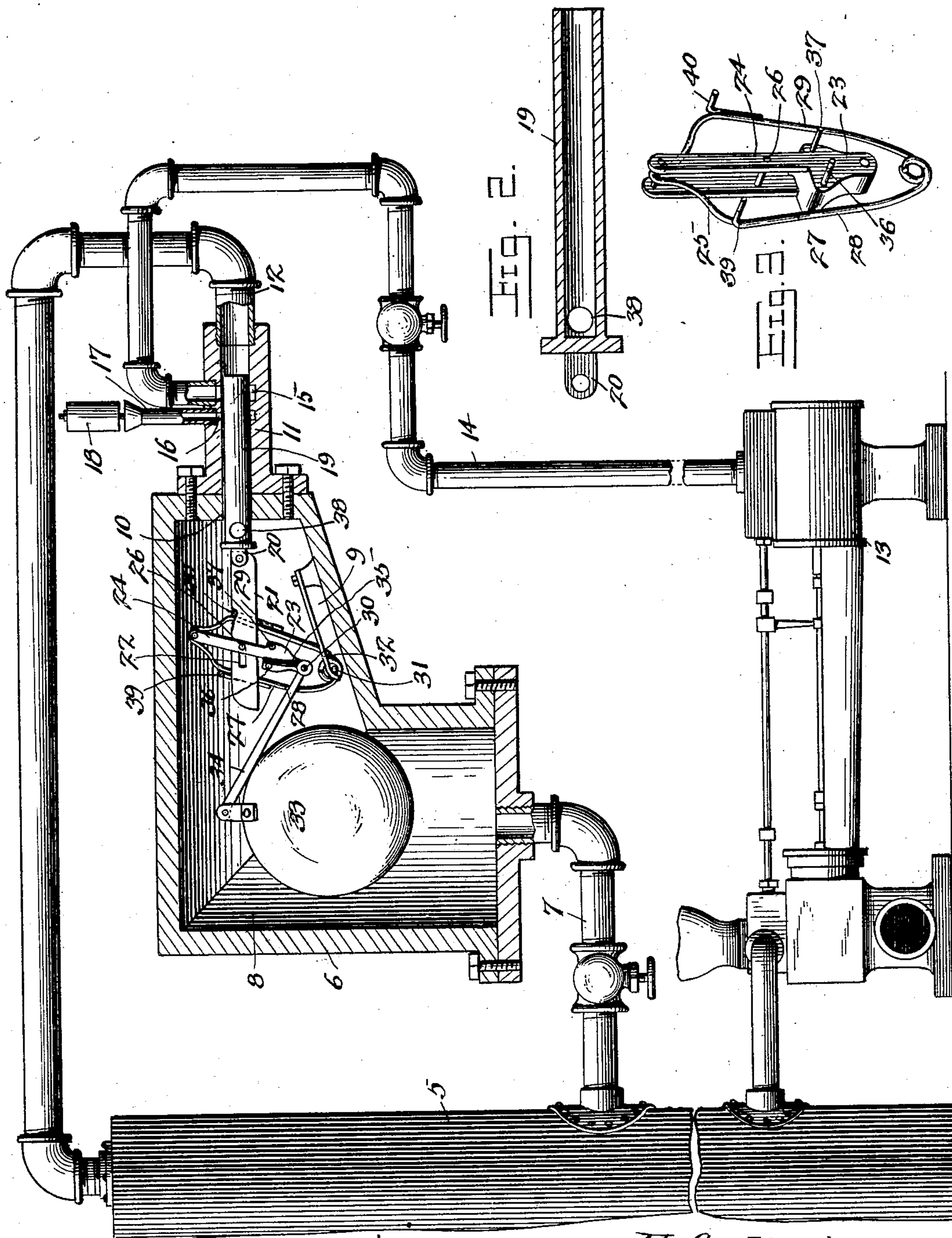
Patented May 6, 1902.

H. COOK.

BOILER FEED REGULATING VALVE AND DEVICE FOR OPERATING SAME.

(Application filed Apr. 26, 1901.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

HOWARD COOK, OF VICKSBURG, MICHIGAN, ASSIGNOR OF TWO-THIRDS
TO ROSWELL P. SMITH AND WILLIAM W. TOOKER, OF VICKSBURG,
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BOILER-FEED-REGULATING VALVE AND DEVICE FOR OPERATING SAME.

SPECIFICATION forming part of Letters Patent No. 699,150, dated May 6, 1902.

Application filed April 26, 1901. Serial No. 57,592. (No model.)

To all whom it may concern:

Be it known that I, HOWARD COOK, a citizen of the United States, residing at Vicksburg, in the county of Kalamazoo and State of Michigan, have invented a new and useful Boiler-Feed-Regulating Valve and Device for Operating Same, of which the following is a specification.

This invention relates to boiler-feed regulators; and it has specific reference to the valve thereof, the object of the invention being to provide such a construction and arrangement of parts as will insure a quick operation of the valve to open up or cut off the steam-supply to the feed-pump when the boiler-water has dropped or raised to a given point.

A further object of the invention is to provide an arrangement controlled by the valve for sounding an alarm when the water in the boiler drops to the danger-point.

Other objects and advantages of the invention will be understood from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a view partly in elevation and partly in section and showing the invention as applied to a boiler and its feed-pump. Fig. 2 is a longitudinal sectional view of the valve. Fig. 3 is a perspective view of the rocker which directly operates the valve.

Referring now to the drawings, there is shown a boiler 5, which may be of any specific type, and with which is connected the float-chamber 6 through the medium of a pipe 7 at the lower end thereof, the chamber including a vertical portion 8 and a horizontal portion 9, which extends in a direction preferably away from the boiler, although this is not essential, as will be understood. The outer end of the horizontal portion 9 has an opening 10 therein, with which registers the bore of a tubular valve-seat 11, attached to the end of the chamber and having a pipe 12 attached to its outer end and connected with the boiler, this pipe being designed for supplying steam to the float-chamber against the upper surface of the water therein and to supply steam

to the alarm and to the pump-feed pipe at the proper times.

The feed-pump is shown at 13, and the pump-feed pipe 14 is connected with the valve-seat and leads directly from the port 15, which is in the form of an annular groove cut in the inner surface of the seat at a point spaced slightly from the end of the seat. A second and similar port 16 is formed in the valve-seat slightly in the rear of the port 15, and leading from this second port is a pipe 17, to which is connected a steam-whistle 18. Thus if the port 15 be uncovered steam from the pipe 12 will be fed to the pump to operate it, and if the port 16 be subsequently uncovered steam will be fed to the whistle to blow it.

To cover and uncover the ports 15 and 16, a tubular cylindrical valve 19 is provided and is fitted in the seat, so that when moved in one direction it covers first port 16 and then port 15, and when moved in an opposite direction it uncovers first port 15 and then port 16. When the valve is in position to cover both ports, it must prevent leakage of steam to the pump, so that the pump may not be heated and operation thereof prevented, and for this purpose the valve must be moved suddenly from closed position into position to uncover port 15. The sudden uncovering of port 16 is of course not necessary. To move the valve gradually until the port is about to be uncovered and then to give it its further movement suddenly, the following mechanism is provided: The valve is provided with spaced ears 20, between which is pivoted one end of a bar or plate 21, having a longitudinal slot 22, adjacent to its outer end, which projects through the horizontal portion of the float-chamber. A rocker is provided and consists of a base 23, having upwardly-directed arms 24 and 25, which lie at opposite sides of and extend above the bar 21, and through these arms is passed a pin 26, which engages with the slot 22 in the bar. Thus if the rocker be oscillated its pin will have a degree of lost motion with respect to the bar and will then engage the end of the slot to move the bar and therewith the valve.

In order that the rocker may be suddenly thrown after it has been moved from one side

to the other of its center of oscillation, a frame 27 is provided and comprises the parallel side portions 28 and 29, which are brought together at their upper ends, where they are
 5 pivoted to and between the ends of the arms of the rocker. The sides of the frame extend below the pivot 30 of the rocker, and at the bottom of the frame is a bar 31, with which
 10 is engaged a leaf-spring 32, secured to the bottom of the horizontally-extending portion of the chamber, and which spring tends to draw the frame downwardly. Thus when the
 15 rocker is moved to either side of its center of oscillation the spring through the medium of the frame draws the rocker suddenly to one side, so that the bar 21, and therewith the valve, is suddenly moved to open or to close the port 15.

To move the rocker from one side to the other of its center of oscillation, a float 33 is provided and is disposed in the valve-chamber, and this float is attached to one end of an angular lever 34, including the finger 35, which lies between the spaced pins 36 and 37
 25 on the base of the rocker, said lever being pivoted at its angle to the pivot of the rocker, and the spacing of the pins is such that when the finger presses one pin to move the rocker and the rocker has moved to its limit the
 30 other pin will be brought into contact with the finger or in close proximity thereto, so that when the float moves in an opposite direction it will reversely move the rocker.

The position of the float of course depends upon the height of the water in the float-chamber, and thus when the float sinks with the water the rocker is actuated to move the valve to uncover the port 15, so that steam may pass to the pump to actuate it to supply
 40 the boiler. The float will then rise, and when the water has reached the proper height the rocker will be reversely operated to cut off the steam-supply and stop the pump. If after the port 15 has been uncovered the
 45 pump fails to operate or for any other reason water is not fed to the boiler in sufficient quantity or at all, the float will drop still further, thus to impart added movement to the rocker to cause the same to actuate the valve
 50 to uncover the port 16, when steam will pass to the whistle to blow it.

In order that steam may pass from one end of the valve to the other, so as not to hold it against movement and to permit of steam-pressure on the surface of the water in the float-chamber, the valve is formed tubular, as above stated, and through the end thereof in the float-chamber is formed a passage 38, through which steam may pass from the valve
 60 into the float-chamber.

In order that the valve may not move beyond its positions to cover and uncover the port 15 when moved suddenly by the rocker, the sides of the frame 27 are provided with the fingers 39 and 40, and the finger 39 is positioned to lie in the path of the end of the bar 21 to form a stop therefor when the frame has moved to shift the valve to its open position, while the finger 40 is positioned to engage in a notch 41 in the bar when the frame has been moved to shift the valve through the medium of the rocker to closed position.

What is claimed is—

1. The combination with an open-ended valve-seat having spaced ports opening thereinto between its ends, and continued throughout the inner circumference of the seat, of a valve disposed slidably in the seat and adapted successively to cover both ports and to uncover them, said valve having a passage there-
 75 through and opening therefrom beyond the ports when the valve is in position to cover both ports.

2. The combination with a valve-seat having connections at both ends for supplying fluid-pressure thereto, said valve-seat having ports leading thereto between its ends and being continued at their inner ends, of a valve slidably disposed in the seat to cover and uncover the ports, said valve having a passage
 85 therethrough for conveying fluid under pressure from one to the other of said connections, a rocker connected with the valve and carrying spaced abutments, a float, and a lever carried by the float and having a pro-
 90 jection to engage the said abutments.

3. The combination with a valve-seat having a port therein, of a valve in the seat for opening and closing the port, a rocker pivoted for movement from one side to the other of its center of oscillation and operatively connected with the valve to move it into open and closed positions, a frame connected to the rocker above its pivot, a spring connected to the frame below the pivot of the rocker for
 105 holding the rocker yieldably at either side of its center of oscillation, a float-lever operatively connected with the rocker to move it over its center of oscillation, and stops carried by the frame for limiting the movement
 110 of the valve in either direction under the influence of said spring.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HOWARD COOK.

Witnesses:

JOSIAH ALLEN,
 JOEL SHICK.