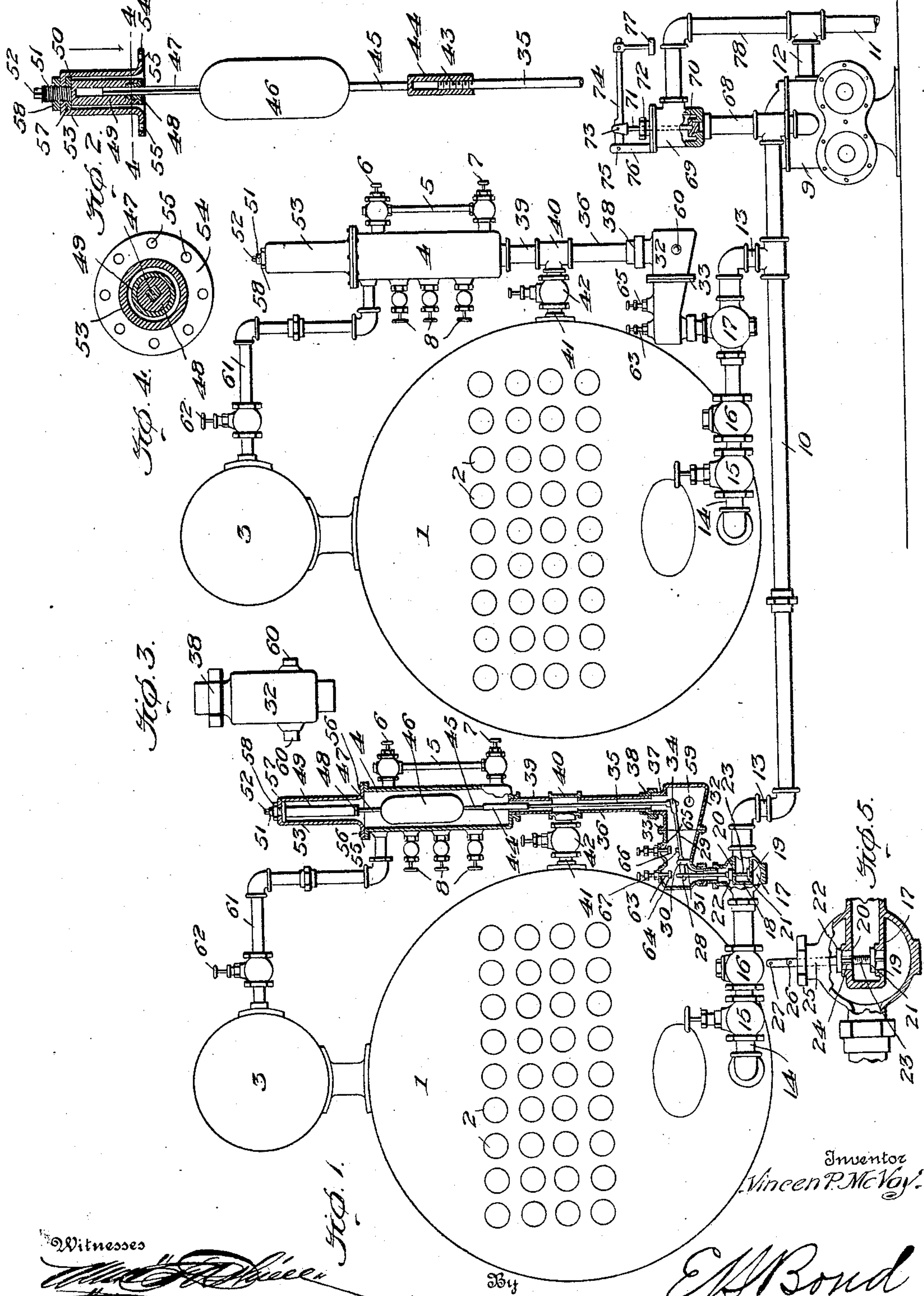


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BOILER FEEDER.
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Patented Dec. 28, 1909.

944,574.



Witnesses

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BOILER-FEEDER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VINCEN P. McVOY, a citizen of the United States of America, and resident of Mobile, in the county of Mobile and State of Alabama, have invented certain new and useful Improvements in Boiler-Feeders, of which the following is a specification.

This invention relates to certain new and useful improvements in boiler feeders, and it has for its objects among others to provide a simple and efficient automatic boiler feed applicable to boilers now in use or to any ordinary form of boiler without any material change in the boiler or its appurtenances.

A further object is to provide an attachment for insuring the automatic feed that can be applied to the usual water column and the usual feed pipe of the boiler.

A further object of the invention is to provide simple yet efficient means for adjusting the parts so as to regulate the height of the water level in the boiler, and also means whereby the valve controlling the feed to the boiler may be held in its open or its closed position when occasion may require.

Still a further object of the invention is to provide means whereby, when the valve or valves controlling the feed from the feed pipe to the boiler or boilers are closed, the pump will continue to operate, the water supplied thereto, instead of being forced through the discharge pipe to the boilers, will be returned to the suction and kept in circulation until such time as the water level in the boiler or boilers may drop sufficiently to cause the float to actuate the feed valve to open the same and allow the water from the pump to be discharged into the boiler with less pressure than required to keep such water in circulation through the pump and its connection with the supply.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an end view showing the in-

vention as applied to two boilers, the matter at the left being indicated in substantially a central vertical section. Fig. 2 is an enlarged detail of one of the floats and its connections, with parts shown in section. Fig. 3 is an enlarged detail in elevation of the valve casing hereinafter more particularly described. Fig. 4 is an enlarged cross section on the line 4—4 of Fig. 2, looking in the direction of the arrow. Fig. 5 is an enlarged sectional detail of the double valve and connections.

Like numerals of reference indicate like parts in the several views.

The invention is applicable to one or a plurality of boilers. In the present instance, I have chosen to show it as connected up with two boilers 1, 1 of any well-known or approved type, but it is to be understood that the invention is in no wise restricted in its use to any given number of boilers, it being equally applicable to one or to a dozen, more or less.

2 designates the tubes, 3 the steam dome, 4 the water column, 5 the water glass, 6 and 7 the ordinary valves therefor and 8 the gage cocks, all of well-known or any approved form of construction and operating in the usual way. My invention is applicable to this or any well-known form of boiler, as will soon be described.

9 is a feed pump of conventional form or otherwise, 10 being the discharge pipe therefrom leading to the pipes which feed the boilers and 11 is the suction pipe of the pump designed to be connected with any suitable source of supply, 12 being the branch connecting said pipe with the pump.

From the pipe 10 there is a connection to each boiler near the bottom by means of a branch 13 and 14, in the latter of which is the ordinary valve 15 and a check 16 of usual construction. The branch 13 empties into the enlarged regulating valve chamber 17, as seen in the sectional detail at the left of Fig. 1. Its inner end 18 is closed but in its bottom wall is an opening or port 19 and in the upper wall an opening or port 20. These ports are adapted to be simultaneously opened or closed by valves 21 and 22 respectively, the one being seated within the branch and the other fitted to a seat upon the outside thereof. In order to facilitate

insertion and removal of these valves, the lower valve has a threaded stem 23 which engages a threaded opening 24 in the upper valve, this detachable connection being disposed within the end of the branch 13. These valves are of like area, the valves themselves being of any well-known material and form of construction.

The valve 22 has an upwardly projecting stem 25, to which is jointed, at 26, a link 27, the upper end of which has pivotally connected therewith, as at 28, a substantially horizontal arm 29 fulcrumed, at 30, on a suitable standard or support 31 within the casing 32, as seen at the left of Fig. 1. This casing is made in sections, the two sections being flanged, as shown at 33, and secured in any suitable manner, as by bolts, to form a water-tight joint. It is to be noted that this arm or lever 29 is fulcrumed considerably to one side of its center, the end of the longer arm being pivotally connected, as at 34, with the vertical rod or stem 35, which passes upward through the pipe 36 which is detachably connected with a boss or the like 37 on the outer section of the casing 32, by means of a coupling 38. This pipe or tube is shown in sections, the upper portion 39 being connected with the lower portion by an ordinary T-coupling 40, with which is connected an equalizing pipe 41 having connection with the boiler and provided with an equalizing valve 42 of well-known construction and for the usual purpose.

The upper end of the rod 35 is screw-threaded, as shown at 43, said screw-threaded end having threaded engagement with a sleeve 14 carried by the lower end of the stem 45 connected to the float 46. Projecting from the upper end of the float 46 is a stem or rod 47, which is polygonal in cross section so as to hold the float against turning, but allowing it to reciprocate vertically. This polygonal portion 47 is received within the correspondingly shaped bore of a screw gland 48 which has threaded engagement with a tube 49 shouldered at its upper end, as seen at 50. Projecting beyond the shouldered portion is a screw 51, the upper end of which may be made polygonal, as shown at 52, to receive a wrench, or it may be adapted to be turned in any other manner. The tube 49 is loosely received within a casing 53, flanged, as at 54, and having openings 55 in the flange for the reception of screws or other means 56 by which it is secured upon the top of the water column.

57 is a gasket or washer, preferably of lead or analogous metallic substance. This gasket surrounds the screw 51 and is interposed between the shoulder 50 and the inner wall of the outer end of the casing 53. A nut 58 is employed upon the outside of the casing and engaging the screw and serving

as a jam nut for drawing up the gasket, and insuring a tight joint.

The stem 25 may be guided in any suitable manner, a suitable guide being indicated at the left of Fig. 1.

The casing 32 is provided with suitable openings 59, closed by suitable means or closures 60, said openings being for the purpose of permitting the assemblage of the arm or lever 29 and the parts connected therewith, that is, the pivots connecting the ends of said lever with the valve stem and with the rod depending from the float. The float, as will be understood, is disposed within the water column, as seen in the sectional detail at the left of Fig. 1, and the water column is connected with the steam dome by suitable piping 61 in which is interposed a valve 62 in the usual manner and for the usual purpose.

63 is a screw stem or rod adjustably mounted in the upper side of the casing 32 in line with the upper end of the link 27, having preferably an enlarged lower end, as seen at 64. This screw stem is designed for the purpose of being screwed down when necessary to engage the upper end of said link and hold the valves 20 and 21 tightly to their sides when it is desired to cut off the boiler from the supply, as, for instance, when the fire is banked over night or to cut out any particular boiler.

65 is a similar stem having an enlarged lower end 66 arranged in vertical alinement with the arm or lever 29 and adapted to engage a teat or projection 67 on said arm or lever to limit the upward movement thereof to force the lever down and consequently the valves 21 and 22 upward and hold the latter from their seats, so as to permit of ingress of water to the boiler to increase the water level therein for the purpose of maintaining sufficient water to start the boiler in the morning without adjustment of the regulating device.

Referring now to the pump and its connections, it will be observed that there is a pipe 68 connected with the discharge pipe from the pump and leading to a chamber 69, the communication with which is controlled by a valve 70 carried by a stem 71 working through suitable stuffing box 72, said stem being pivotally connected, as at 73, with an arm 74 pivoted at 75 on a suitable upright or standard 76 and upon its free end carrying an adjustable weight 77. 78 is a pipe connecting the chamber 69 with the suction pipe 12.

With the parts constructed and arranged substantially as hereinbefore described and connected up with a boiler or boilers, as illustrated in Fig. 1, the operation is as follows:—The stems 63 and 65 being in the position indicated in Fig. 1 and the valves opened and the feed pump started, water is

drawn in through the suction pipes 11 and 12 and out through the pipe 10 (it being understood that the boilers have been previously filled to their mean water line, and the valves 20 and 21 being held open, more or less, through the medium of the float and its connections) and through the branches 13 and the ports 18 and 19 and branch 14 to the boiler. After this, the flow of water to the boiler or boilers is automatically regulated by the position of the float in the water column. When the pump has increased the height of the water in the boilers sufficiently to cause the float to rise and close the valves 20 and 21, the water can no longer pass out through the pipe 10 but is forced upward through the pipe 68, overcoming the pressure of the valve 70, opening the latter and allowing the water to pass through the pipe 78 and back again to the pump, through the pipe 12, thus keeping up a constant circulation until the water in the boiler drops to such a point as to cause the float 46 to open the valves 20 and 21 which will then automatically cause the valve 70 to close and the water flows in through the suction pipes 11 and 12 to the pump and out through the pipe 10 to the boiler or boilers as before. The valves 20 and 21, being of the same area, are balanced and, under ordinary conditions, the valve 70 remains closed, but, when the valves 20 and 21 are closed, then the pressure is sufficiently increased to cause the opening or raising of the valve 70 so that the water goes out through the pipe 68 and back to the pump and so on. It is to be understood that any one or more of the boilers may be shut off without affecting the operation of the others and that this control is entirely automatic.

When it is desired to vary the water line of the boiler and to cause the valves 20 and 21 to open sooner or later, the jam nut 58 on the screw 51 is loosened and said screw then turned up or down in one direction or the other, which will cause a shortening or lengthening of the connection between the rod 35 and the tubular member 44 and, when the parts are in the desired adjusted position, they are there held by tightening up the jam nut 58, it being understood that the polygonal portion 47 of the stem of the valve is held against turning in its socket in the gland 48.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What is claimed as new is:—

1. In a boiler feeder, the combination with a boiler and the water column, of a float in said water column, balanced valves controlling the flow of water to the boiler, pivotally connected connections between the float and the valves, one of the members thereof being pivotally mounted, and means ad-

justable for engagement with the pivotally mounted member for holding said valves in their open position.

2. In a boiler feeder, the combination with a boiler and a water column, of a float in said water column, balanced valves controlling the flow of water to the boiler, a vertical stem carrying said valves, a pivotally mounted member pivotally connected at one end with said stem and at the other end with a vertical member connected with the float, and adjustable means engageable with said stem for holding said valves in their closed position and for limiting the movement of their stem.

3. In a boiler feeder, the combination with a boiler and a water column, of a float in said water column, balanced valves controlling the flow of water to the boiler, a stem carrying both of said valves, a horizontally disposed pivoted member pivotally connected at one end with said stem and at the other end with a stem connected with the float, adjustable means for engagement with said pivoted member upon one side of its pivot for holding said valves open, and adjustable means disposed upon the opposite side of said pivot for engaging the valve stem and holding the valves closed.

4. In a boiler feeder, the combination with the water column, the boiler and the feed pipe therefor, of a float in the water column, balanced valves controlled by said float to control the flow of water to the boiler, and means embodying a pivoted member connected with the valve stem and an adjustable rod connecting said pivoted member with the float for varying the time of movement of said valves.

5. In a boiler feeder, the combination with the water column, the boiler and the feed pipe therefor, of a float in the water column, balanced valves for controlling the flow of water through the feed pipe to the boiler, a pivoted support for said valves connected with the float, means for varying the time of movement of the valves, and means adjustable for engagement with said pivoted support for holding the valves open.

6. In a boiler feeder, the combination with the water column, the boiler and the feed pipe therefor, of a float in the water column, balanced valves for controlling the flow of water through the feed pipe to the boiler, a pivoted support for said valves connected with the float, means for varying the time of movement of the valves, means adjustable for engagement with said pivoted support for holding the valves open, and means adjustable for direct engagement with the valve stem for holding said valves closed when desired.

7. In a boiler feeder, a boiler, a feed pipe therefor, a water column, balanced valves controlling the flow through the feed pipe, a

float in the water column, a stem for the valves, a stem for the float, and an intermediate pivoted member pivotally connected with said stems and adjustable means disposed upon opposite sides of the pivot of said member for holding the valves either open or closed.

8. In a boiler feeder, a boiler, a feed pipe therefor, a water column, balanced valves controlling the flow through the feed pipe, a float in the water column, a stem for the valves, a stem for the float, an intermediate pivoted member pivotally connected with said stems, and adjustable means adjacent the pivot of said intermediate member for engaging the stem of the valves to hold them closed.

9. In a boiler feeder, a boiler, a feed pipe therefor, a water column, balanced valves controlling the flow through the feed pipe, a float in the water column, a stem for the valves, a stem for the float, an intermediate pivoted member pivotally connected with said stems, and adjustable means adjacent the pivot of said intermediate member for engaging said pivoted member to hold the valves open.

10. In a boiler feeder, a boiler, a feed pipe therefor, a water column, balanced valves controlling the flow through the feed pipe, a float in the water column, a stem for the valves, a stem for the float, an intermediate pivoted member pivotally connected with said stems, adjustable means adjacent the

pivot of said intermediate member for engaging the stem of the valves to hold them closed, and adjustable means adjacent the pivot of said intermediate member for engaging said pivoted member to hold the valves open.

11. In a boiler feeder, a feed pipe, valves controlling the same, a jointed stem for the valves, a pivoted lever connected with said stem, a water column, a float within the same, an adjustable connection between the float and lever, a casing mounted on the water column, a polygonal stem on the float, and means carried by said casing operatively connected with said polygonal stem.

12. In a boiler feeder, a feed pipe, valves controlling the same, a jointed stem for the valves, a pivoted lever connected with said stem, a water column, a float within the same, an adjustable connection between the float and lever, a casing mounted on the water column, a polygonal stem on the float, means carried by said casing operatively connected with said polygonal stem, and means within said casing between a shoulder on said first-named means and the outer end of the casing for insuring a water-tight joint.

Signed by me at Washington, District of Columbia, this 5th day of February, 1909.

VINCEN P. McVOY.

Witnesses:

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