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W. LOUDON.

BOILER FEED REGULATING MECHANISM.

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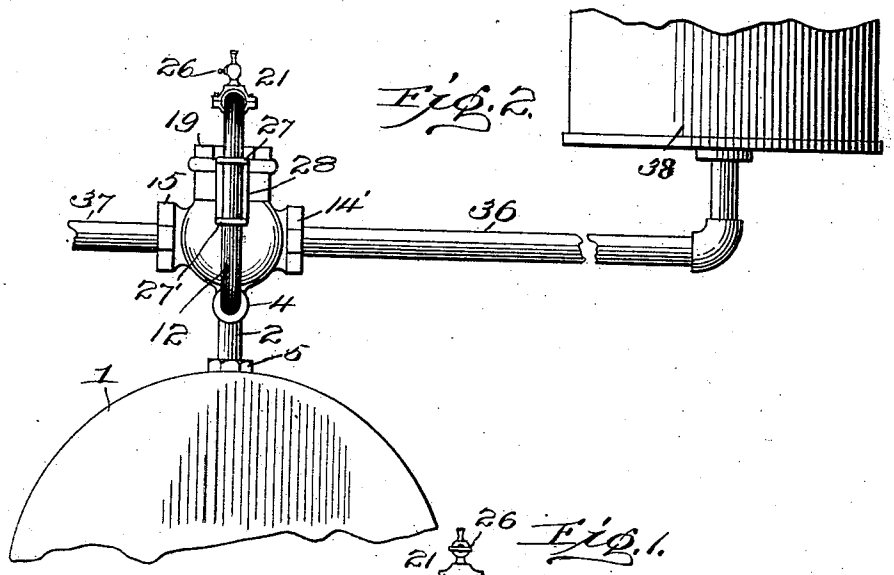

Fig. 2.

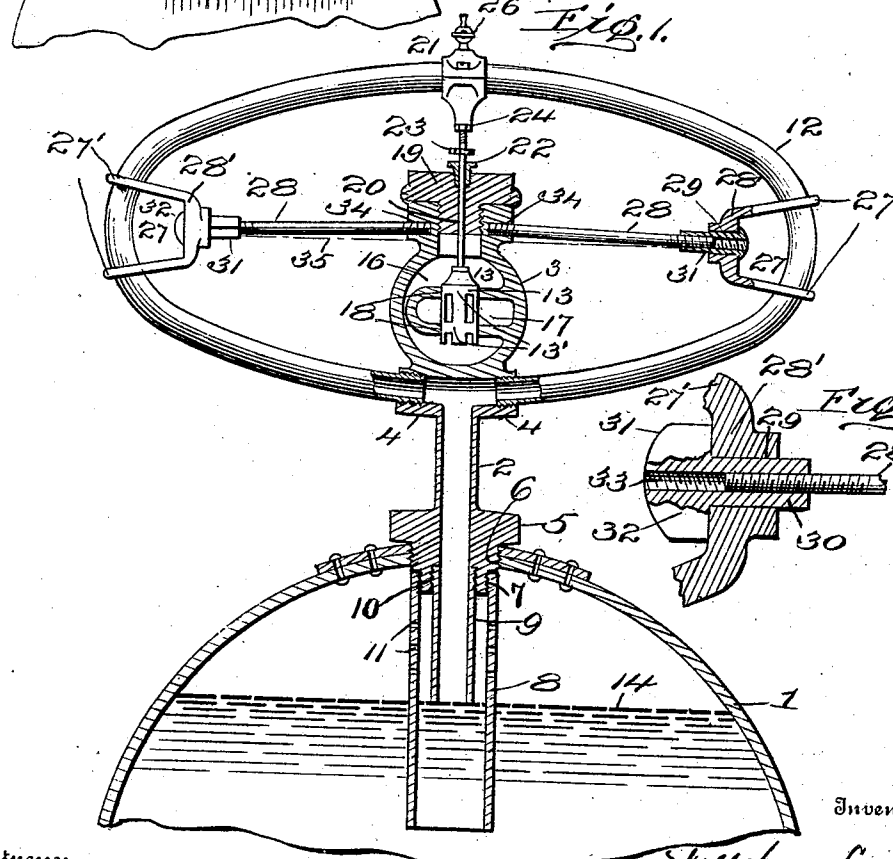

Fig. 1.

Fig. 3.

Witnesses

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BOILER-FEED-REGULATING MECHANISM.

No. 848,476. Specification of Letters Patent. Patented March 26, 1907.

Application filed March 1, 1906. Serial No. 303,724.

To all whom it may concern:

Be it known that I, WILLIAM LOUDON, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Boiler-Feed-Regulating Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in valve-actuating means whereby steam or any liquid may be automatically supplied to a pump or motor or water may be supplied to a boiler.

The object of the invention is the provision of means for facilitating the supplying of water to a boiler or steam or liquid to a motor, the liquid being under pressure.

With this and other objects in view the invention consists of certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is transverse fragmentary view of a boiler, showing the preferred structure of the feed-water-regulating mechanism secured thereto, said mechanism being shown partly in section. Fig. 2 is a view in end elevation of the structure depicted in Fig. 1 and showing a fragmentary view of a tank coöperating therewith. Fig. 3 is a longitudinal sectional view of one of the nuts which are employed for connecting the yokes to the stay-rods.

Referring to the drawings by numerals, 1 designates a boiler of any ordinary type, upon which is secured a regulating mechanism constructed in accordance with the present invention.

The feed-water-regulating mechanism comprises a hollow base portion 2, which is integral with a valve-casing 3. Diametrically opposite hollow extensions 4 4 are formed upon the base portion 2 below valve-casing 3. A polygonal extension 5 is formed integral upon the lower part of the base portion 2 and is threaded at 6. The base portion 2 is threaded at 7, and upon its threaded portion a removable hollow member or tubing 8 is secured. An inner hollow member or tubing 9 is threaded, as at 10, thereby permitting said member to be secured within a part of the base portion 2. The outer or primary member 8 is provided with apertures 11. The primary member 8 is of sufficient length to at all times have its lower end submerged in the water contained in the boiler; but the inner or auxiliary member 9 is of less length than the primary member 8, for the reason that through the medium of this pipe the lower end of the primary member 8 is always submerged in the water of the boiler. While the water outside of the primary member 8 may be disturbed, the water within said member 8 will be undisturbed, and therefore obviating the possibility of the regulating mechanism being operated when water is not required to be supplied to the boiler, as it will be seen that if the liquid was disturbed or rolling, as is often the case with the liquid in marine boilers on vessels, the lower end of the auxiliary member 9 would be uncovered and permit the steam to pass up into the elliptical expansible tubing 12 and operate the valve 13 when, perhaps, it was not necessary. When the water line or column 14 in the boiler 1 falls below the lower end of the tubular auxiliary member 9, steam contained between the outer surface of said member 9 and the inner surface of the tubular primary member 8 will be permitted to pass into the member 9. Steam is contained between the two tubular or hollow members 8 and 9 by means of the apertures or perforations 11 of member 8.

The elliptical tubular member 12 is preferably positioned horizontally. The ends of the tubing 12 are provided with right and left screw-threaded surfaces, which are adapted to be positioned within the similarly-constructed internal surface of the hollow extensions 4 4 of the base portion or member 2 by threading the base portion and valve-casing upon the ends of said expansible tubing.

The valve-casing 3 is integral with the base portion 2 and is provided with an extension 14′, having an inlet-opening, and with an extension 15, having an outlet-opening. The inlet-opening communicates with the compartment 16 of the valve-casing 3, while the outlet-opening communicates with the compartment 17 of said casing. The valve-casing is provided with a double valve-seat 18 18, which is adapted to receive the two members 13′ 13′, constituting the valve 13. A removable cap 19 is threaded into the casing 3. The cap 19 is provided with an aperture, through which extends the valve-stem 20. The valve-stem is secured to the valve 13 at

one end and is adjustably secured to a yoke or depending sectional member 21, which is carried by the expansible tubing 12 above the valve-casing 3. It will be noted that the member 21 is positioned upon the highest part of the expansible tubing or member 12. A stuffing-box 22 is positioned upon the cap 19 for preventing the escape of liquid or steam which might be contained in the compartment 16 of the casing 3. The stem 20 is provided with an integral polygonal extension 23 for facilitating the adjustment of the valve 13. The adjustment of the valve 13 is desired when the same is not properly seated in the valve-casing 3. A jam-nut 24 is positioned upon the threaded portion of the valve-stem 20 and is normally engaging the lower section of the yoke member 21. It will be obvious that the jam-nut 24 locks the valve-stem 20 in an adjusted position. It is to be noted that the upper end of the valve-stem 20 is threaded into the lower section of the yoke 21. By reason of this threaded structure the valve-stem 20 may be removed from the yoke or adjusted longitudinally thereof.

A vent-valve 26 is carried by the yoke 21, whereby the interior of the expansible tubing may be placed in direct communication with the outer atmosphere by imparting rotary movement to the valve member of said valve 26. It will be noted that this valve is employed for permitting the escape of atmosphere contained in the expansible tubing, as it is a fact that often superfluous atmosphere is contained in said tubing, which if not allowed to escape would affect the operation of the mechanism.

The valve 13 is provided with depending legs or ribs constituting guides for positively directing the members 13′ 13′ to a seated position. After the mechanism has been secured upon the boiler it may be found that the valve 13 is not properly seated within the casing, and therefore such contingency is anticipated in the adjustable structure of the valve through the medium of the stem 20, polygonal extension 23, and jam-nut 24.

In diametrically opposite positions upon the elliptical expansible member or tubing 12 there are positioned yokes 27 27, and the yokes 27 are positioned upon the narrowest portions of the ellipse and connected to the valve-casing 3 by means of adjustable stay-rods 28. Each yoke is provided with substantially parallel portions 27′, which are connected at one of their ends by an integral base portion 28′. The base portion 28′ of each yoke 27 is provided with an aperture 29, within which is positioned the polygonal shank 30 of nut 31, Fig. 3. The aperture 29 is of sufficient diameter to permit the polygonal shank 30 of the nut 31 to freely revolve therein. The shank 30 is integral with a head 32. An aperture 33 is formed in the nut 31 and extends longitudinally the entire length of the shank and head. Upon referring to Fig. 1 it will be noted that both ends of each rod 23 is threaded, whereby one end may be threaded into one of the threaded recesses 34 of the valve-casing 3 and its opposite end may be threaded into the internally-threaded aperture 33 of one of the nuts 31. By reason of the tubular structure of the nuts 31 any tool—as, for instance, an ordinary monkey-wrench—may be employed for gripping or clamping the polygonal shanks 30 of the nuts 31 outside of the yokes for tightening the stay-rods by turning said nuts, and thereby threading the rods into said nuts or, if it is desired, the rods may be loosened in the same manner. The stay-rods 28 are slanted slightly upward toward the valve-casing 3, thereby placing the rods at a slight angle to a horizontal plane, as indicated by dotted line 35. By slightly slanting stay-rods 28 upward a slight expansion of the tubular member 12 will move the valve 13 from off its seat a considerable distance, as substantially all of the expansion of the tubing 12 is upward, for the stay-rods and yokes 28 and 27, respectively, will not permit the tubing 12 to expand laterally. Said rods will be drawn upward against the outer ends of the elliptical tubing.

36 is an inlet-pipe, and 37 an outlet-pipe. In the drawings the inlet-pipe 36 is preferably connected to a tank 38. If it is desired, water in tank 38 may run through the valve-casing to the boiler or the inlet-pipe 36 may be connected to the boiler in such manner as to permit steam to pass through the valve-casing to operate a pump that feeds or supplies the water to the boiler. It is immaterial or optional with the operator as to which method is adopted. It will also be noted that the mechanism may be employed for actuating a motor, as the liquid under pressure may pass from the inlet-pipe 16 into the valve-casing and out through the pipe 37 to a motor.

While the mechanism is generally used on top of the boiler-shell, it is also as well adapted to the top of the water column of boilers, particularly in such cases as have not sufficient space above the boiler. The mechanism may be employed to govern the flow of water into boilers where no pump is used, but the flow comes direct from gravity-pressure.

In operation when the water in the boiler gets below the lower end of the pipe 9 steam will pass up into the elliptical spring-tubes and cause the same to expand. In expanding the tube 12 reciprocates the rod 20, and consequently operates the valve 13 and permits water to flow into the boiler. After the water has filled the boiler sufficiently the steam is cut off from the pipe 9 by the water closing the end thereof, and the pipe 12 will

in consequence slightly collapse or return to its normal position and close the valve 13 through the action of the rod 20.

What I claim is—

1. In a mechanism of the class described, the combination with an expansible member of stay-rods connecting the major axis of said expansible member, said stay-rods being positioned at an incline to said axis, adjustable means connecting the outer ends of said stay-rods to said expansible member for adjusting the length of said rods, means connecting the inner ends of said stay-rods, and a valve connected to said expansible member and operated thereby.

2. In a mechanism of the class described, the combination with an expansible member, of stay-rods, means connecting said stay-rods near their outer ends to diametrically opposite portions of said expansible member, means connecting the said stay-rods near their inner ends, said stay-rods extending slightly upwardly from their outer to their inner ends, and valve means connected to said expansible member, the slanting position of said stay-rods causing considerable movement of said valve means relative to a slight expansion of the expansible member.

3. In a mechanism of the class described, the combination of a polygonal extension, a hollow base portion integral with said extension, a plurality of tubes connected to said extensions and extending into the boiler, a valve-casing integral with said base portion, expansible means carried by said valve-casing and base portion, a valve positioned within said valve-casing, and means connecting said valve to said expansible means.

4. In a mechanism of the class described, the combination of a hollow base portion, a valve-casing integral with and positioned above said base portion, hollow extensions extending upon opposite sides of and integral with said valve-casing, expansible means connected to said extensions, a valve positioned within said casing, and means connecting said valve to said expansible means.

5. A mechanism of the class described, comprising an elliptical expansible tube, upwardly-slanting connecting-rods secured to the widest portion of said expansible tube, valve means connected to said expansible tube, a hollow support secured to said expansible tube and connecting the said tube with the boiler, and reciprocating means connected to the narrowest part of said expansible tube for operating said valve.

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

WILLIAM LOUDON.

Witnesses:
G. WARD KEMP,
L. C. MASSIE.