

J. J. LAWLER.
BOILER PRESSURE REGULATOR.
APPLICATION FILED OCT. 5, 1910.

1,010,438.

Patented Dec. 5, 1911.

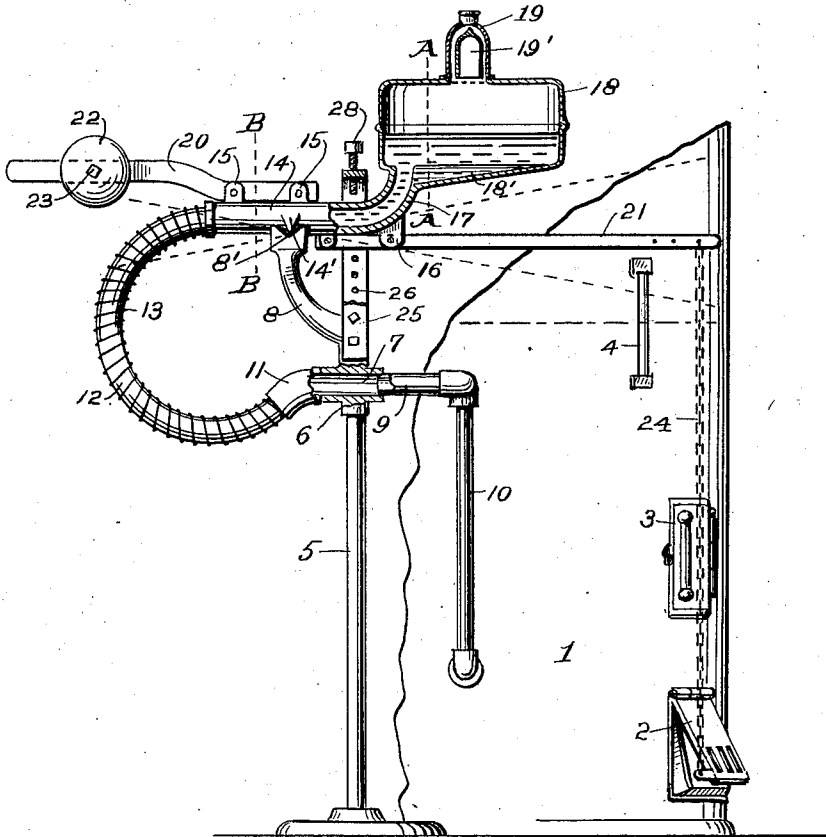


Fig. 1.

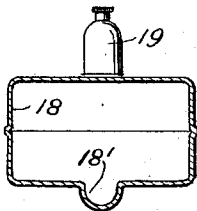


Fig. 3.

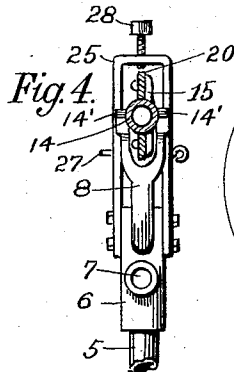


Fig. 4.

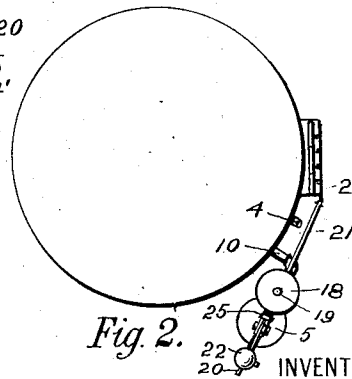


Fig. 2.

WITNESSES:

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JAMES J. LAWLER, OF PELHAM, NEW YORK.

BOILER-PRESSURE REGULATOR.

1,010,438.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed October 5, 1910. Serial No. 585,378.

To all whom it may concern:

Be it known that I, JAMES J. LAWLER, a citizen of the United States, and resident of Pelham, in the county of Westchester and State of New York, have invented certain new and useful Boiler-Pressure Regulators, of which the following is a specification.

This invention relates to an attachment for regulating the pressure in steam boilers used for heating purposes, working under a vapor or low pressure, and has for its objects to produce a regulator in a manner as hereinafter set forth, whereby a simple positive device is produced, which is directly and easily attached to a steam boiler, for automatically regulating the pressure in the same.

A further object of the invention is to produce such a regulator which permits of accurate adjustment by avoiding the use of any joints in the tilting means, so that the regulator is affected by the least change in pressure even when such pressure is so slight that it does not actuate a pressure gage.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described and illustrated in the accompanying drawings, wherein like reference characters denote corresponding parts in the several views.

Figure 1, is a side elevation partly in section, attached to a boiler, which is broken away for clearness of illustration. Fig. 2, is a diagrammatic plan view reduced in size, to show method of attaching to a boiler. Fig. 3 is a vertical sectional view of the tank on line A—A of Fig. 1, and Fig. 4 is a vertical sectional view of the balancing frame and fitting, on line B—B of Fig. 1.

The boiler, 1, has the usual ash pit door, 2, under the firing door, 3; a gage glass, 4, indicates the level of the water in the boiler, shown by dot and dash line. This description applies to the common type of boilers, regardless of interior construction, the only requirement being that the ash pit door be hung from the top to adapt it for my attachment.

The regulator is supported on an upright stand, 5, of a proper height to suit the boiler. The stand is surmounted by a cast fitting, 6, having a passage way, 7, and a bracket, 8, extending from the body. The

outer end of this bracket may be bifurcated, as shown in Fig. 4, and has a V notch 8', which affords a bearing for the tilting part of the apparatus, as will be more fully described. One end of the fitting, 6, has a pipe, 9, screwed into it, which pipe and connection, 10, are directly connected near the lower end of the boiler, so that the water contained in the boiler can flow freely through said pipe and connections, in either direction. Into the opposite end of the fitting, 6, an angle elbow, 11, is screwed, to which a flexible hose, 12, is attached, the hose being preferably "armored" or spirally wound with a wire, 13. The other end of the flexible hose is connected up with the tilting body, consisting of a tubular part, 14, having ears, 15, above and ears, 16, below the tubular part. On opposite sides of this tubular body are two V shaped projections, 14', the bottom edges of which rest in the bottom of the V shaped bearings, 8' on the bracket, 8. The tubular body on its free end curves upwardly into a rounding elbow, 17, upon which a tank, 18, is mounted. This tank is provided with a slanting gutter, 18', at the bottom, and is surmounted by an air valve, 19, of any preferred make, having a float, 19'.

A bar, 20, preferably having an offset is fastened to the ears, 15, above the tubular fitting, 14, and a straight bar, 21, is fastened to the ears, 16, below the fitting, as shown in Fig. 1. A ball weight, 22, is adjustably placed on the bar, 20, and when once adjusted is held in position by a set screw, 23. On the free end of the bar, 21, a chain, 24, is fastened and connected to the ash pit door near its lower edge. An iron strap, 25, is fastened upon the fitting, 6, in such a manner as to straddle the tubular body, 14, as shown in Fig. 4. In Fig. 1, the front part of this strap is broken away above the fastening point where it is bolted in place. A series of holes, 26, are drilled through both legs of the strap for the insertion of a pin, 27, to limit the downward movement of the bar, 21; the top or cross-piece of the strap is provided with a set screw, 28, which limits the upward movement of the tubular body, 14; the dotted lines, crossing each other at the bearing point on the bracket, 8, in Fig. 1, indicates the path traveled by the tilting body and the bars extending therefrom.

Such being the construction, the opera-

tion is as follows:—The tank being positioned at a height above the water level to correspond with the pressure it is desired to carry in the boiler, say one half a pound per square inch, or equal to a column of water fourteen inches high, the weight 22, is adjusted to exactly balance the weight of the bar 21, chain 24 and door 2 when open and there is no pressure in boiler. The sharp edge bearing at the tilting point affords a means of balancing the movable parts very accurately. When pressure in the boiler is created, the water, standing in the pipes, 10, and 12, being open to the air is forced up through the flexible hose into the tank, 18, and when a proper quantity has reached there, the weight of this water will tilt the movable part so that the door, 2, will be closed and the air supply to the fire checked. When the pressure in the boiler falls below the desired point, the water in the tank will drain back into the boiler, and when enough of it has been discharged from the tank, the weighted end becomes the heavier, and tilting in the reverse direction, the apparatus causes the draft door to open and admit air under the fire, whereby combustion is accelerated. This operation continues automatically as long as there is sufficient fire to generate pressure in the boiler. The tank is always open to the air, except when the water rises too high, in which case the float in the air valve will close and prevent any water from escaping. There are no valves, ground joints, or other fittings to prevent the free flow of the water or the free action of the tilting movement, and as the operation or tilting part of the apparatus is balanced on a knife edge, like a pair of beam scales, it is very sensitive to any variation in pressure and a very small quantity of boiler water operates it, the limit of movement in either direction being governed by the screw, 28, and pin 27.

What I claim is—

1. An attachment for steam boilers for regulating the pressure therein including a tilting member comprising a tubular fitting having transversely-extending V-shaped bearings, a tank communicating with one end of said tubular fitting, a flexible hose attached to the other end of said fitting, a bar connected to the lower portion of said fitting, a chain on the free end of said bar and connecting with the door of the boiler, a weighted bar attached to the upper portion of said fitting and adapted to counter-balance the combined weight of said tank, bar, chain and door, a stationary tubular fitting communicating with said flexible hose and provided with means for the reception of said bearings, thereby supporting said tilting member, and a pipe for establishing communication between said stationary tubular fitting and the boiler.

2. An attachment for steam boilers for regulating the pressure therein including a tilting member comprising a tubular fitting having transversely-extending V-shaped bearings, a tank communicating with one end of said tubular fitting, a flexible hose attached to the other end of said fitting, a bar connected to the lower portion of said fitting, a chain on the free end of said bar and connecting with the door of the boiler, a weighted bar attached to the upper portion of said fitting and adapted to counter-balance the combined weight of said tank, bar, chain and door, a stationary tubular fitting communicating with said flexible hose and provided with means for the reception of said bearings, thereby supporting said tilting member, a pipe for establishing communication between said stationary tubular fitting and the boiler, and means carried by said stationary tubular fitting for limiting the tilting movement of said tilting member.

3. An attachment for steam boilers for regulating the pressure therein including a tilting member comprising a tubular fitting having transversely-extending V-shaped bearings, a tank communicating with one end of said tubular fitting, a flexible hose attached to the other end of said fitting, a bar connected to the lower portion of said fitting, a chain on the free end of said bar and connecting with the door of the boiler, a weighted bar attached to the upper portion of said fitting and adapted to counter-balance the combined weight of said tank, bar, chain and door, a stationary tubular fitting communicating with said flexible hose and provided with means for the reception of said bearings, thereby supporting said tilting member, a pipe for establishing communication between said stationary tubular fitting and the boiler, said tank having an opening communicating with the atmosphere, and a float valve within said tank for controlling said opening.

4. An attachment for steam boilers for regulating the pressure therein including a tilting member comprising a tubular fitting having transversely-extending V-shaped bearings, a tank communicating with one end of said tubular fitting, a flexible hose attached to the other end of said fitting, a bar connected to the lower portion of said fitting, a chain on the free end of said bar and connecting with the door of the boiler, a weighted bar attached to the upper portion of said fitting and adapted to counter-balance the combined weight of said tank, bar, chain and door, a stationary tubular fitting communicating with said flexible hose and provided with means for the reception of said bearings, thereby supporting said tilting member, a pipe for establishing communication between said stationary

tubular fitting in the boiler, means carried
by said stationary tubular fitting for limit-
ing the tilting movement of said tilting
member, said tank having an opening com-
municating with the atmosphere, and a float
5 valve within said tank for controlling said
opening.

Signed at New York in the county and
State of New York this 4th day of October
A. D. 1910.

JAMES J. LAWLER.

Witnesses:

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