

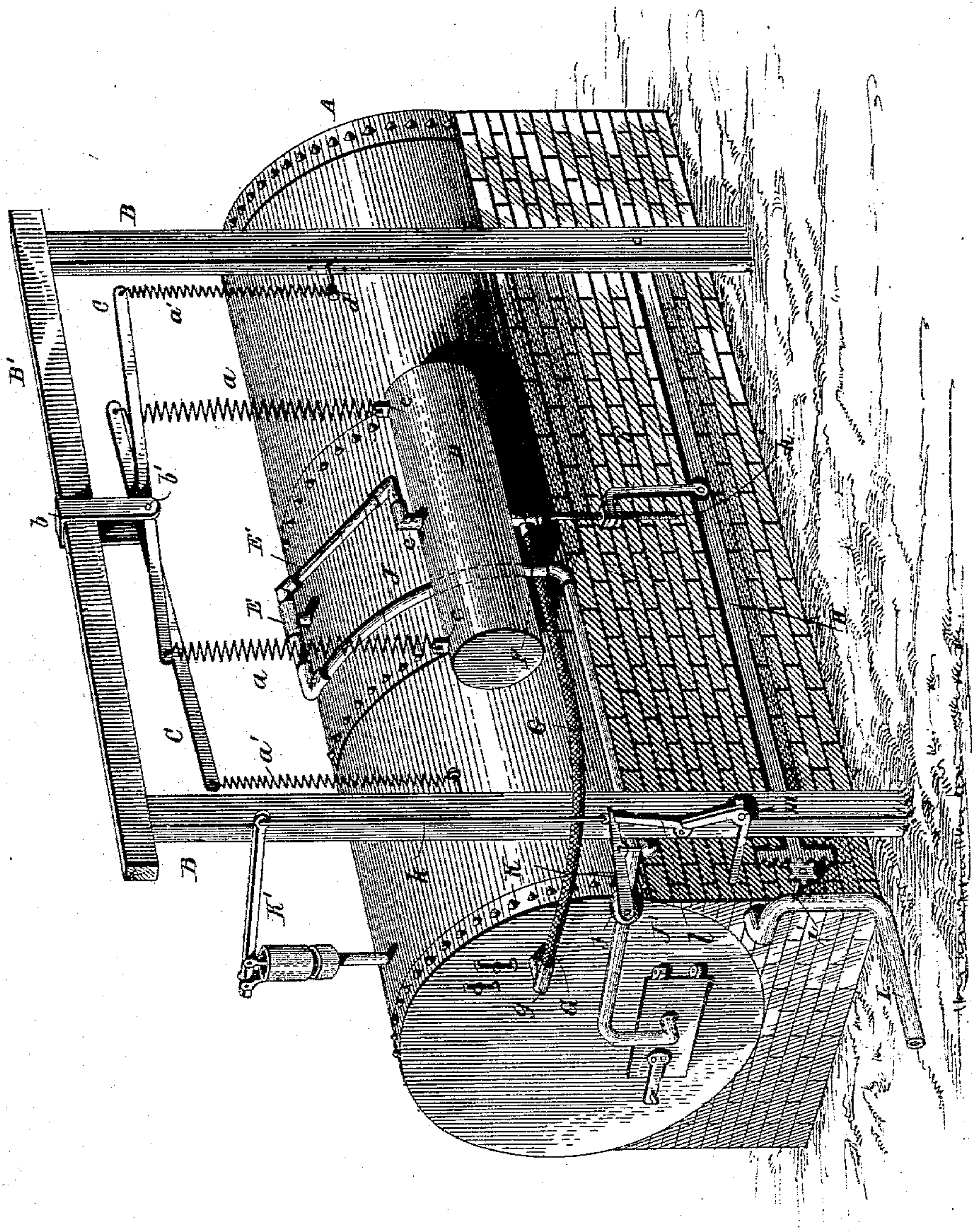
(No Model.)

B. H., A. R. & E. R. BLOOD.

BOILER FEED REGULATOR.

No. 356,676.

Patented Jan. 25, 1887.



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# UNITED STATES PATENT OFFICE.

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## BOILER-FEED REGULATOR.

SPECIFICATION forming part of Letters Patent No. 356,676, dated January 25, 1887.

Application filed September 30, 1886. Serial No. 214,949. (No model.)

*To all whom it may concern:*

Be it known that we, BYRANT H. BLOOD, ARTHUR R. BLOOD, and ERASTUS R. BLOOD, citizens of the United States of America, residing at Ludlow, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Boiler-Feed Regulators; and we 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, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which form a part of this specification.

Our invention relates to certain new and useful improvements in boiler attachments, or devices for keeping the boiler automatically supplied to a premeditated height with water.

Our invention consists in suspending adjacent to the boiler a receptacle or tank which is kept partly filled with water, and in providing said tank with connections whereby, when the tank is elevated, which is done automatically, a valve will be turned so as to admit water to the boiler; and our invention also consists in providing the attachment with means whereby, when the water becomes low in the boiler, an alarm will be sounded and steam ejected upon the fire, so as to extinguish the same.

Our invention also consists in the construction and combination of the parts, as will be hereinafter fully set forth, and specifically pointed out in the claims.

In the accompanying drawing, which illustrates our invention, we have shown the same by a perspective view, in which—

A refers to the boiler, which is mounted on a suitable base. Adjacent to one side of the boiler are located uprights B B, which are connected to each other at their upper ends by a cross-bar, B', from which depends a loop, b, which is provided with a transverse pivot, b', which serves as a support for the pivoted bars C C. These bars C C are each provided at one end with depending springs a a, which are attached at their lower ends to upwardly-projecting ears c c, attached to the upper edge of the movable receptacle or tank D. The ends of

the bars C C adjacent to the uprights B have attached thereto springs a', which are connected to the uprights B in any suitable manner, preferably by means of adjustable pins d, which may be inserted in different perforations in the edges of the uprights.

E refers to a short section of pipe which extends into the boiler, near the center thereof, and to which a pipe, E', is pivotally attached, so that the outer end adjacent to the receptacle D will be capable of a pivotal movement. The opposite end of this pipe is suitably coupled and attached to an elbow-joint, e, which is secured to the upper portion of the tank to admit steam. The bottom portion of the tank D is provided with an elbow or angular section of pipe, F, to which is attached a flexible connection or tube, G, the opposite end thereof being attached to a connection or pipe-joint, g, which enters the boiler below the normal level of the water, so that the water can flow from the boiler and partially fill the receptacle or tank D. From the under side of the coupling F depends a screw-threaded rod, h, which engages with a pivoted arm, h', which is adjustably secured thereto and to a lever, H, which is pivoted to one of the uprights B. The end of this lever H has formed thereon a rack-bar, which engages with a cog-wheel attached to the stem i of a valve for cutting off or letting on the water to the boiler, said valve being located in the supply-pipe I. The rod h, hereinbefore referred to, is provided above and below the bent end of the bar h' with nuts, so that the receptacle D may be adjusted properly with respect to the lever.

J refers to a pipe which extends from the coupling or joint E to the front portion of the boiler, the end terminating in the fire-box. This pipe J has located therein at a suitable point a valve, J', to the stem of which is attached a weighted arm or lever, K, the outer end of said lever being connected by a rod, k, to the arm k' of the steam-whistle. The lever K is supported in an almost horizontal position by a pivoted arm, l, which engages with the outer end thereof, and this arm is held in position by a pivoted crank-arm, m, which is pivoted to one of the uprights, the projecting arm thereof being in a line with the movement



of the rack-bar of the lever, so that the same will engage with the crank-arm and release the lever K when the lever H moves upwardly.

The operation of our invention, when constructed as hereinbefore described, is as follows: The water or fluid is admitted to the boiler through the pipe I, in the usual manner, said pipe being preferably provided with an inspirator or other means for forcing the water in the boiler when required. When the boiler has been sufficiently filled, it will enter the receptacle or tank D through the flexible pipe G, the level of the water in the boiler and tank being the same. When the fire is made up under the boiler, there will be an equal height of water in the tank D and the boiler. Should the water in the tank fall below the normal level it will lighten the tank D and will cause the same to be elevated by the action of the supporting-springs and the movable levers. This movement of the tank will elevate the lever H so as to cause the rack-bar thereon to turn the valve *v*, so as to admit water to the boiler through the supply-pipe. Should the level of the water fall suddenly from any cause the movement of the lever will open the valve, as hereinbefore described, and the end of the lever H in its upward movement will contact with the crank-arm *m*, so as to release the lever K, and allow the same to fall so as to admit steam from the boiler upon the fire, so as to extinguish the same. This movement will also cause the lever *k'* to fall and sound an alarm.

It will be noted that the devices hereinbefore described operate automatically.

The device hereinbefore described may be applied to oil-tanks and similar devices, as well as steam-boilers.

We claim—

1. In a device for automatically regulating the water-level in boilers, a tank suspended adjacent to the boiler and connected to the same below the water-level by a flexible connection and above the water-level by a movable pipe, said tank being supported by springs attached to same and to pivoted lever, the tank being connected to a lever for operating a valve in the supply-pipe, substantially as shown, and for the purpose set forth.

2. In combination with a boiler or receptacle, A, a tank, D, attached to a support by springs and pivoted levers, so that it will be elevated or depressed, according to the amount of liquid contained therein, pipes E' G, connecting said tank to the boiler, and a lever

connected to the movable tank D, for operating a valve located in the supply-pipe I, substantially as shown, and for the purpose set forth.

3. In a device for keeping the water in a steam-boiler at a certain height, a tank or receptacle, D, suspended by means of spiral springs, pipes pivotally connected and attached to the upper part of the boiler and upper portion of the tank, and a flexible tube or pipe connected to the boiler below the normal water-level and to the bottom portion of the tank D, and a pivoted lever attached to the underside of the tank and provided with a rack-bar for operating a valve in the supply-pipe, the parts being combined and organized substantially as shown, and for the purpose set forth.

4. In combination with a device for maintaining a normal water-level in steam-boilers, substantially as described, a pipe extending from the upper portion of the boiler to the fire-box, said pipe being provided with a valve, and means whereby said valve is automatically turned and an alarm sounded when the water falls below the normal level, substantially as shown, and for the purpose set forth.

5. In an automatic device for maintaining water at a level in steam-boilers and sounding an alarm and extinguishing the fire under the boiler when the water falls below the normal level, the combination of a tank or receptacle, D, connected at its upper and lower portions to the upper portion of the boiler and below the normal water-level of the same by flexible connections, springs for supporting said tank or receptacle, and a depending-bar attached to a lever for operating a stop-cock or valve in the supply-pipe, a steam-whistle and a steam-pipe which is attached to the upper portion of the boiler and terminates in the fire-box, and a crank-arm for supporting said lever in an elevated position, said crank-arm extending over the lever H so as to be actuated thereby, substantially as shown, and for the purpose set forth.

In testimony whereof we affix our signatures in presence of witnesses.

BYRANT H. BLOOD.  
ARTHUR R. BLOOD.  
ERASTUS R. BLOOD.

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