

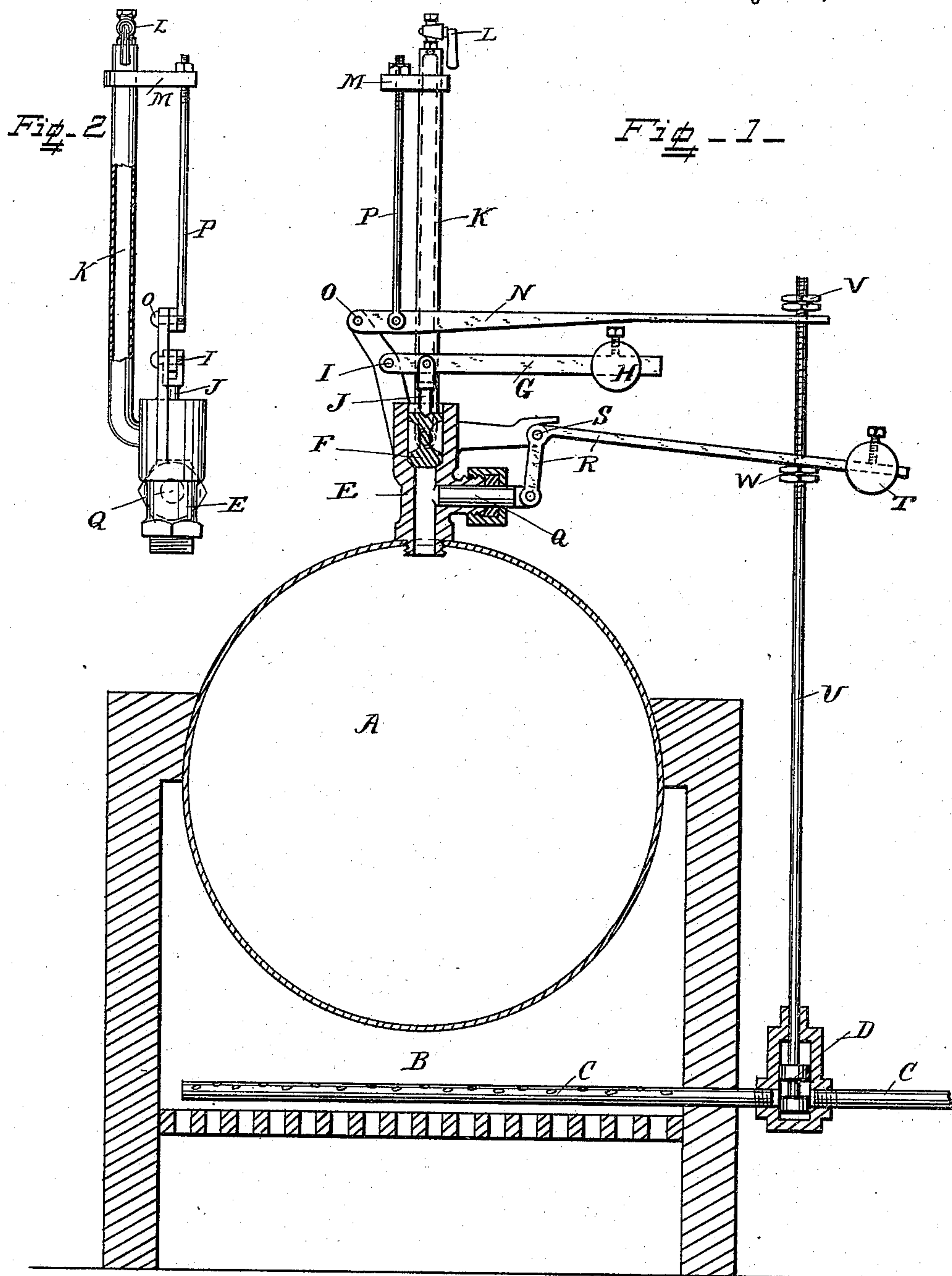
(No Model.)

G. E. BRETTELL.

AUTOMATIC FUEL REGULATOR FOR BOILERS.

No. 383,557.

Patented May 29, 1888.



Witnesses,

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AUTOMATIC FUEL-REGULATOR FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 383,557, dated May 29, 1888.

Application filed August 8, 1887. Serial No. 246,379. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. BRETTELL, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Apparatus for Regulating the Feed of Fuel to Steam-Boiler Furnaces; 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 apparatus for regulating the feed of fuel to the furnace of a steam-boiler; and it consists in the novel construction of the parts hereinafter fully described and claimed.

Figure 1 in the drawings shows a side view of the device, partly in section and attached to a steam-boiler. Fig. 2 is a side view of the device, taken at right angles to the position shown in Fig. 1, and showing the expansion-pipe partly in section.

A is the boiler, which may be of any approved construction, and B is the boiler-furnace, suitable for burning liquid, gaseous, or finely-pulverized fuel.

C is the fuel-supply pipe, and D is a valve, which is preferably a balanced valve, and which controls the feed of the fuel through the pipe into the furnace.

E is a valve-casing secured to the upper part of the boiler, and F is a valve, something like an ordinary safety-valve, which covers the hole in the casing and prevents the escape of steam when down on its seat.

G is a lever provided with the adjustable weight H. This lever is pivoted by the pin I to the casing, and is provided with the pivoted spindle J, which bears upon the valve.

K is the vertical brass expansion-pipe, the lower end of which is bent around and connected to the valve-casing above the valve, so that the steam may enter the said pipe when the valve is raised.

L is a small cock at the top of the pipe, forming an adjustable outlet for the steam and condensed water.

M is an arm secured to the upper end of the brass pipe.

N is a lever pivoted to the valve-casing by

the pin O, and P is a link which connects the arm M with the said lever.

Q is a plunger working steam-tight in the casing beneath the valve and in free communication with the steam-space of the boiler.

R is a bell-crank lever pivoted to the valve-casing by the pin S. The short arm of this lever is pivoted to the end of the plunger, and the long arm is provided with the adjustable weight T.

U is the spindle of the valve D, which regulates the feed of the fuel to the boiler-furnace. This spindle is provided with the adjustable tappets V and W, which are actuated by the levers N and R, respectively.

The operation of the device is as follows: The fuel is forced or is allowed to flow through the supply-pipe and its valve, and is burned in the boiler-furnace, generating steam within the boiler. When the pressure in the boiler reaches its maximum and it is required to diminish the supply of fuel, the valve F lifts and allows the steam to flow into the brass expansion-pipe. The steam condensing in the pipe is driven out at the cock at the top of it, and the heat of the steam expands the pipe lengthwise and raises the lever N by means of the link P. The free end of lever N raises the tappet V and partially or wholly closes the valve D, according to the adjustment of the tappet. When the supply of fuel is deficient and the pressure falls, the steam no longer supports the plunger Q against the downward pressure of the weight T. The said weight depresses the long arm of the bell-crank lever, which pushes down the tappet W and allows a more liberal supply of fuel to pass through the pipe to the boiler-furnace.

What I claim is—

1. The combination, with a steam-boiler and its furnace, of a valve connected to the boiler and rising when the steam exceeds a given pressure, a valve for supplying fuel to the boiler-furnace, and a metallic pipe connected to the said steam-valve at one end and having its other end connected to the fuel-supply-valve spindle, whereby the expansion of the said pipe will close the fuel-supply valve when steam is admitted to the said pipe, substantially as set forth.

2. The combination, with a steam-boiler and

its furnace, of a valve connected to the boiler and rising when the steam exceeds a given pressure, a valve for supplying fuel to the boiler-furnace, and a metallic pipe connected
5 to the said steam-valve at one end, and having its other end provided with an adjustable outlet for condensed water and connected to the fuel-supply-valve spindle, whereby the expansion of the said pipe will close the fuel-supply
10 valve when steam is admitted to the said pipe, substantially as set forth.

3. The combination, with a steam-boiler and its furnace, of a steam-valve casing connected to the boiler, the metallic expansion-pipe secured to the steam-valve casing, the weighted
15 steam-valve seated in the said casing below the lower open end of the said pipe, a lever pivoted to the casing and connected to the upper end of the expansion-pipe, a plunger working steam-tight within the casing below the
20 valve, a weighted bell-crank lever pivoted to the said casing and to the end of the plunger, and the valve for regulating the feed of the fuel, provided with a stem and actuated by
25 the free ends of the said levers, substantially as and for the purpose set forth.

4. The combination, with a steam-boiler and its furnace, of a steam-valve casing connected to the boiler, the metallic expansion-pipe se-

cured to the steam-valve casing, the weighted
30 steam-valve seated in the said casing below the lower open end of the said pipe, a lever pivoted to the casing and connected to the upper end of the expansion-pipe, a plunger working steam-tight within the casing below the
35 valve, a weighted bell-crank lever pivoted to the said casing and to the end of the plunger, the valve for regulating the feed of the fuel, provided with a stem, and the adjustable taps secured upon the said stem and actuated
40 by the free ends of the said levers, substantially as and for the purpose set forth.

5. The combination, with a steam-boiler and its furnace, of a valve for supplying fuel to the boiler-furnace, and a metallic pipe rigidly
45 supported at one end by the boiler and communicating with its steam-space, and having its other end connected to the fuel-supply-valve spindle, whereby the feed of the fuel will be regulated and proportioned by the expansion and contraction of the said pipe, substantially as set forth.
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In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. BRETTELL.

Witnesses:

GEO. R. HOAGLAND,
EDWARD WEBSTER.