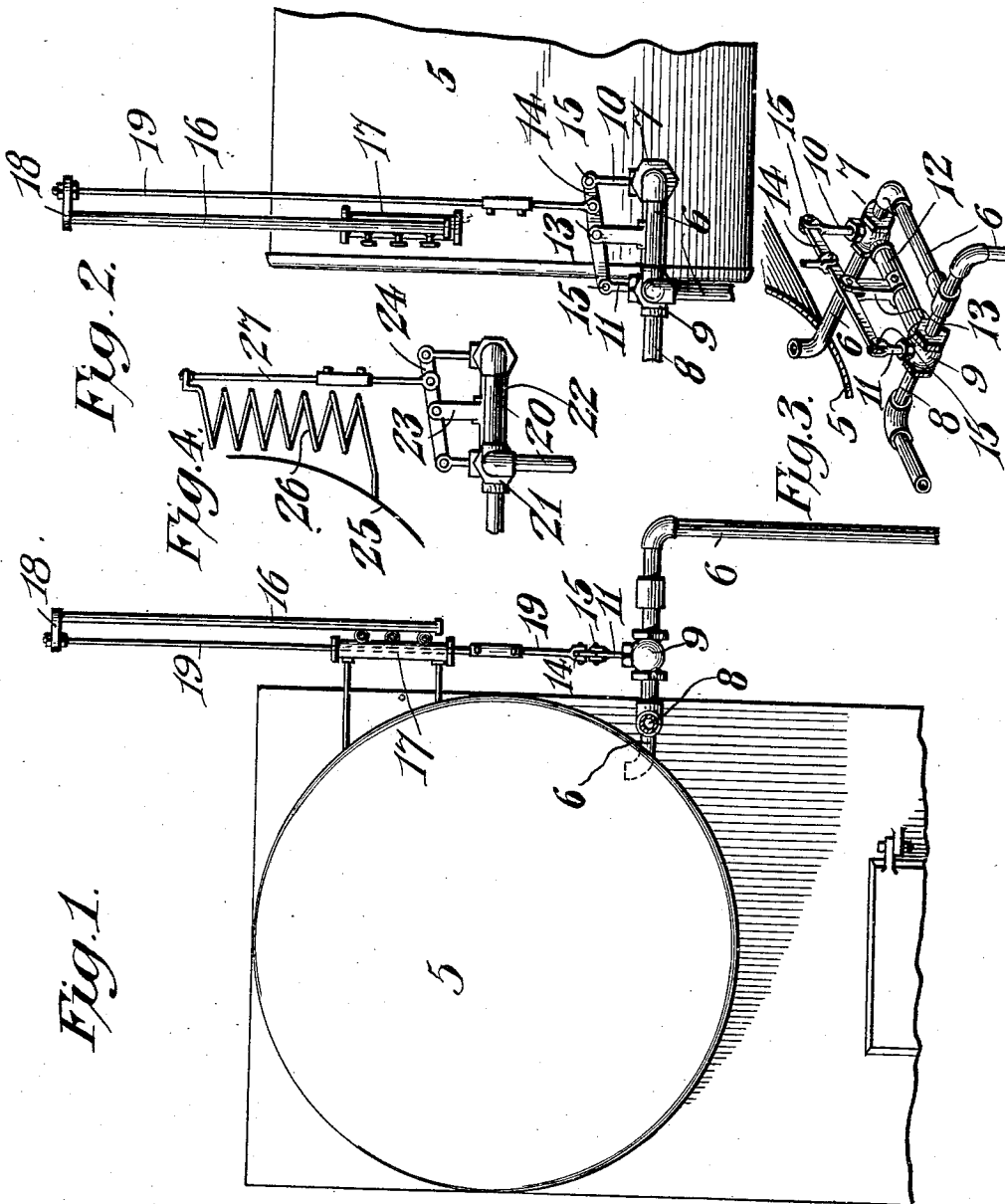


J. W. GIVEN & J. L. FOGG.
 FEED WATER REGULATOR.
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935,651.

Patented Oct. 5, 1909.



Witnesses
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UNITED STATES PATENT OFFICE.

JAMES W. GIVEN, OF SUTTON, AND JOHN L. FOGG, OF BEALLS MILLS, WEST VIRGINIA;
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FEED-WATER REGULATOR.

935,651.

Specification of Letters Patent.

Patented Oct. 5, 1909.

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To all whom it may concern:

Be it known that we, JAMES W. GIVEN and JOHN L. FOGG, citizens of the United States, residing at Sutton and Bealls Mills, in the counties of Braxton and Lewis, respectively, and State of West Virginia, have invented a new and useful Feed-Water Regulator for Boilers, of which the following is a specification.

The primary object of the present invention is to provide novel and exceedingly simple mechanism for automatically controlling the supply of feed water to a boiler, said mechanism being so arranged that when the water in the boiler falls below a certain level, a fresh supply will be admitted thereto, and as soon as the desired level has been established, such supply will be automatically cut off, thereby eliminating the danger incident to a boiler feed that is manually controlled.

Two practical embodiments of the invention are disclosed in the accompanying drawings, wherein:—

Figure 1 is an end elevation of a boiler showing one form of construction applied thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view of the valve mechanism and pipe system. Fig. 4 is a view of a slightly modified form of construction.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed in Figs. 1, 2 and 3, the boiler is designated by the reference numeral 5, and may be of any well known type. The usual feed pipe 6 leading from a pump, inspirator or other suitable mechanism is connected to the boiler 5, and has therein a valve casing 7. An overflow or waste pipe 8, leads from the pipe 6 in advance of the casing 7, and is also provided with a valve casing 9. Valves 10 and 11 are located respectively in the casings 7 and 9. A tie 12 connects the two valve casings, and a post 13 is supported on this tie. A lever 14, fulcrumed upon the post 13, has its ends connected as shown at 15 to the valves 10 and 11. An upstanding thermostatic pipe 16 has its lower end in communication with the boiler 5. In the present embodiment, this communication is obtained through the usual gage mechanism 17, though the pipe 16 may be directly connected to the boiler. The

upper end of the pipe 16 is closed and has an offset arm 18, to which is connected the upper end of a link that comprises relatively adjustable sections 19. The lower end of this link is connected to the lever 14, as shown. The operation of this structure is based on the well known fact that metal when in contact with steam will expand to a greater extent than when in contact with hot water. The lower end of the thermostatic pipe 16 is therefore disposed at the lowest limit of the water level desired in the boiler. Therefore as long as the lower end of said pipe 16 is covered, the said pipe will be in its contracted condition, in which case, the supply controlling valve 10 is closed, while the waste controlling valve 11 is opened. When the level of the water in the boiler falls below the lower end of the pipe 16, steam will enter said pipe, and cause the same to expand, thereby increasing its length. As a result, the supply controlling valve 10 will be opened, while the waste controlling valve 11 will be simultaneously closed. Water will consequently be supplied to the boiler and this supply will continue until the lower end of the thermostatic pipe 16 is again closed. When this occurs, the steam in the pipe 16 will condense, creating a partial vacuum that will cause the water to enter said pipe 16. The pipe therefore again contracts, closing the supply controlling valve and opening the waste controlling valve.

In Fig. 4, a slightly different embodiment of the invention is disclosed. The supply controlling valve in this embodiment is designated 20 and the waste controlling valve 21. The two valve casings are connected to a tie 22 having a post 23 on which is fulcrumed a lever 24 that is connected to the two valves. The boiler is shown at 24 and extending therefrom is a thermostatic pipe 26, which in this embodiment is coiled. The upper end of the pipe has a link connection 27 with the lever 24. It will be evident that this structure operates exactly the same as the above described embodiment, and has all the advantages.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction

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

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is:—

1. The combination with a steam boiler, of a tubular thermostat located exteriorly thereof but connected at its lower end to said boiler at the low-water level thereof, a feed pipe entering the boiler, a valve therein, a waste pipe leading from the feed pipe, a valve therein, a lever connected at one end to the feed pipe valve and at its other end connected to the waste pipe valve, and a rod connected to one end of the lever and at its other end to the thermostat, whereby when the thermostat expands the feed water valve shall be opened and the waste valve closed and when the thermostat contracts the feed water valve shall be closed and the waste valve opened.

2. The combination with a steam boiler, of a tubular thermostat located exteriorly thereof but connected at one end to the low-water level of the boiler, a feed pipe having an angularly bent portion, the end of the

feed pipe entering the boiler, a waste pipe connected to the feed pipe at the beginning of the angularly bent portion, said waste pipe running for a distance parallel with the feed pipe beyond the angularly bent portion, a valve in said waste pipe, a valve in the feed pipe directly opposite to the waste pipe, a tie pipe connecting the parallel portions of the feed pipe and the waste pipe and having an upwardly projecting standard thereon, a lever pivoted in the standard, connections at the opposite ends of said lever to the waste pipe valve and feed pipe valve respectively, and a connection from the end of said lever to the thermostat, whereby when the thermostat expands, the feed water valve shall be opened and the waste valve closed and when the thermostat contracts the feed water valve shall be closed and the waste valve opened.

In testimony, that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

JAMES W. GIVEN.

JOHN L. FOGG.

Witnesses:

J. R. GIVEN,

B. B. BOGGS.