

No. 645,925.

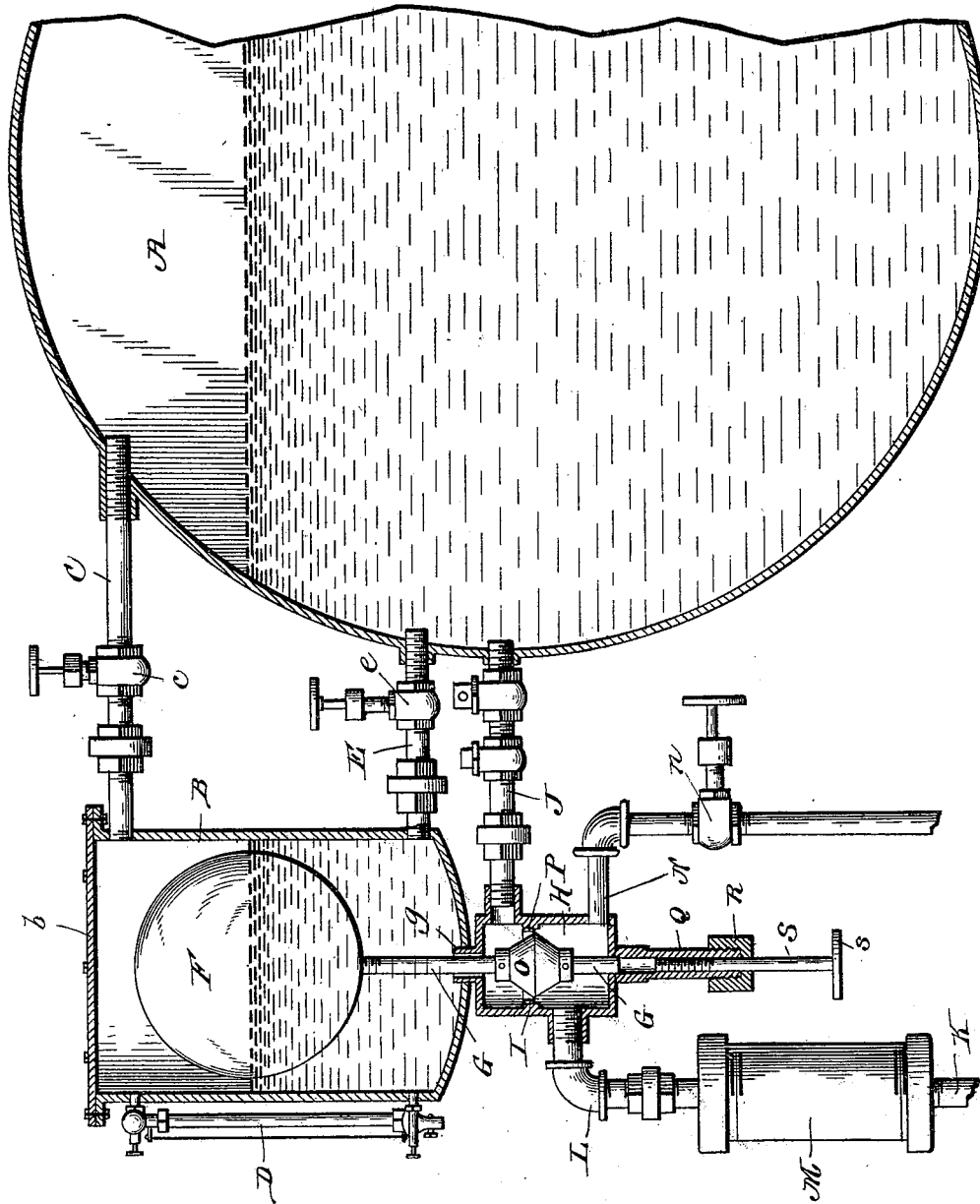
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FEED WATER REGULATOR.

(Application filed Aug. 21, 1899.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

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FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 645,925, dated March 20, 1900.

Application filed August 21, 1899. Serial No. 727,971. (No model.)

To all whom it may concern:

Be it known that we, THEODORE E. BISHOP, HENRY R. WHITNEY, and JOHN SLONIKER, citizens of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Feed-Water 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.

This invention relates to certain new and useful improvements in feed-water regulators of that class embodying a gage-chamber having water-gages thereon, a float contained within said chamber, and steam and water connections between said chamber and the boiler; and it has for its object, among others, to improve upon this class of devices to the end that better results may be attained without materially increasing the cost of production or affecting the simplicity of the device.

We provide a valve-chamber beneath the gage-chamber, and in this valve-chamber is disposed a double-faced or diamond-shaped valve carried by the stem of the float and adapted to be seated upon a seat in the said chamber. This seat is detachably supported, so that it may be readily removed for repairs or other purposes when necessary. A hand attachment is provided for the purpose of operation by hand when the device is not working automatically. The valve-chamber is connected with the water-space of the boiler and also has connected therewith a water-supply pipe, in which, between the pump and the regulator, is placed a chamber or larger section of pipe to prevent any jar or sudden pressure from the supply-pipe upon the regulator-valve in the valve-chamber. Connected with the lower end of the valve-chamber is a blow-out pipe by which the mud or sediment in the valve-chamber may be blown out when necessary and which may also be used to inject oil into the boiler by way of the valve-chamber and feed-water pipe leading to the boiler.

The device as herein illustrated and as hereinafter described may be used on a sin-

gle boiler, or it may be used with a series of boilers, and by placing one of the devices on each of the boilers and connecting them to a main water-supply pipe each and all of the boilers would maintain a regular and corresponding water-level, all being supplied from the one water-pipe and at the same time.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention in its preferable form is clearly illustrated in the accompanying drawing, which forms a part of this specification and in which is shown a substantially-central vertical section through the improvement as applied to a boiler, parts being shown in elevation and the boiler in section with a portion broken away.

In the said drawing, A designates a boiler, applied to which the invention is shown.

B designates the gage-chamber, the upper portion of which is connected, as by pipe C, with the steam-space of the boiler, the said pipe being provided with a suitable valve *c*. By means of this valve the admission of the steam from the steam-space of the boiler to the upper portion of the gage-chamber may be regulated.

D is the glass gage on the gage-chamber. This is of usual construction and for the ordinary purpose of such gages.

E is a pipe connecting the lower portion of the gage-chamber with the water-space of the boiler. It is provided with a suitable valve *e*.

F is a float within the gage-chamber. It is carried by the rod or stem G, which is free to move vertically through a suitable opening in the bottom of the gage-chamber—in this instance shown as working through the nipple or extension *g* of the valve-chamber, which is secured within an opening in the bottom of the gage-chamber, from which the said valve-chamber is suspended.

b is the cover to the gage-chamber, being detachably secured in position by screws, bolts, or other analogous means, so that it may be readily removed when required.

H is the valve-chamber. It may be supported in position below the gage-chamber in any suitable manner. In this instance it

is shown as provided with the nipple or extension *g* above referred to, which is held in the opening in the bottom of the gage-chamber. This valve-chamber is provided with a diaphragm *I*, which serves to divide the chamber into an upper and a lower compartment. The upper compartment of this chamber is connected by the pipe *J* with the water-space of the boiler, as shown, and suitable valves may be placed in this connection, if required.

K is a connection from a suitable pump or water-supply, and this is connected with the lower compartment of the valve-chamber by a pipe *L*. In this connection between the pump or the water-supply is a cylinder or an enlarged pipe-section *M*, through which the water must pass before entering the lower compartment of the valve-chamber, and this is provided for the purpose of preventing any sudden jar or pressure on the valve in the valve-chamber, which would tend to cause a too-sudden actuation of the valve.

N is a pipe connected with the lower portion of the valve-chamber and provided with a suitable cock or valve *n*, by means of which the mud or sediment from the chamber may be blown off when necessary. This valve and pipe may also be employed for the purpose of injecting oil into the boiler by way of the valve-chamber and the feed-water pipe leading from the said chamber to the boiler.

o is the valve in the valve-chamber. It is adjustably and detachably connected to the lower end of the stem *G* of the float and is shown as substantially diamond-shaped. It is adapted to be seated on a valve-seat *P*, which is detachably secured within an opening in the diaphragm *I*, so that it may be removed when necessary for repairs or otherwise. The stem of the float and also the stem of the valve is extended below the lower end of the valve and is guided in its movements in an opening in the bottom of the valve-chamber, as shown.

Q is a pipe depending from the lower end of the valve-chamber, being provided with a stuffing-box *R*, through which passes the rod *S*, which is screw-threaded and engages the threads upon the interior of the said pipe, so that it may be turned up when desired to actuate the valve by engagement with the lower end of the stem thereof. Normally this rod is screwed down, so that its upper end is

away from the lower end of the valve-stem, so that the latter is free to move to its limit without contacting with the upper end of the rod. The lower end of the rod is provided with a suitable handle or hand-wheel *s*, as shown, by means of which it may be turned when it is desired to operate the valve by hand.

The operation will be readily understood from the foregoing description when taken in connection with the annexed drawings, and a detailed description thereof does not seem necessary.

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

What is claimed as new is—

1. The combination with the float-chamber and its connections with the boiler, and the float in said chamber with its stem extended through an opening in the bottom thereof into a valve-chamber, of the valve-chamber having a partition or diaphragm dividing the same into an upper and a lower compartment, an outlet above the diaphragm and a water-supply below the said diaphragm, and a diamond-shaped valve disposed in the lower compartment and carried by a float attached to the valve-stem, as set forth.

2. The combination with the float-chamber and a float therein, of a valve-chamber with diaphragm and inlet and outlet upon opposite sides thereof, a blow-off pipe connected with the lower portion thereof, a connection with the boiler upon one side of said diaphragm, a connection with the water-supply upon the other side of said diaphragm, a pipe extending from the bottom of said chamber provided with a stuffing-box, a valve in the valve-chamber having its stem connected with the float, and a rod threaded in said pipe and arranged to extend within the valve-chamber to engage the valve-stem, as and for the purpose specified.

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

THEODORE E. BISHOP.
HENRY R. WHITNEY.
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Witnesses:

D. C. H. MUNSON,
HOWARD P. DEAN.