

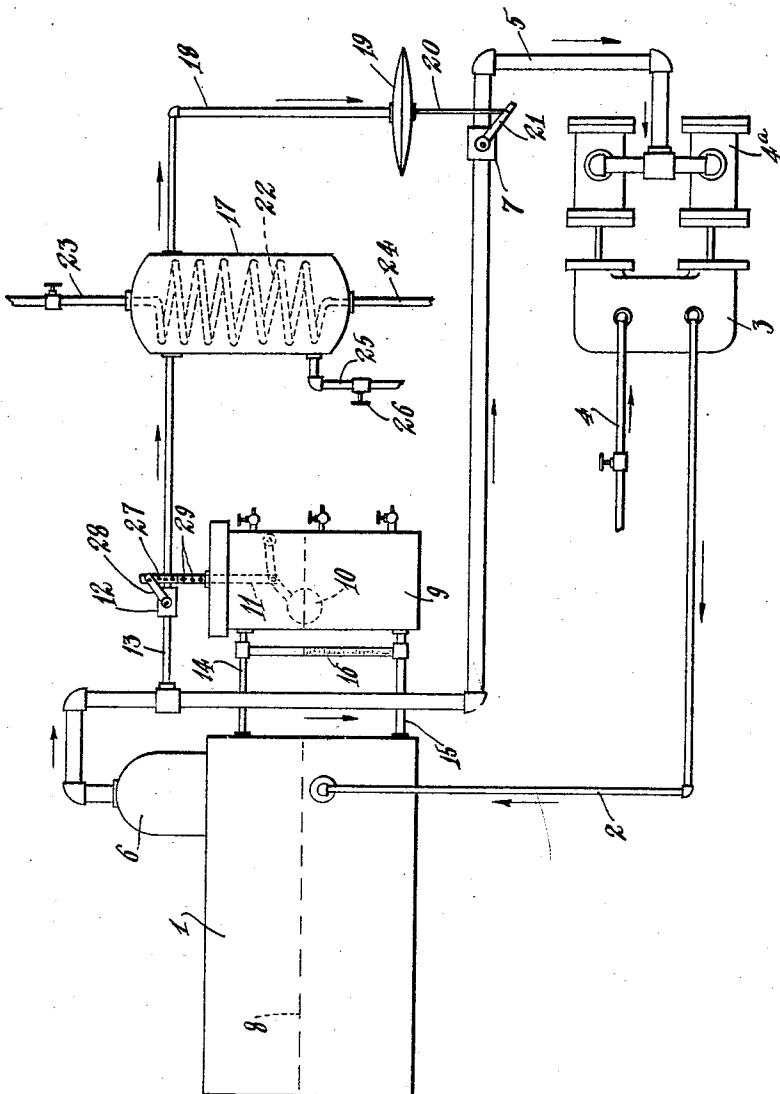
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BOILER CONTROL DEVICE

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UNITED STATES PATENT OFFICE

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BOILER CONTROL DEVICE

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This invention relates to boiler control devices, and is more particularly related to a device or attachment adapted for use in connection with boilers for automatically maintaining within the boiler a predetermined water level.

Many forms of automatic devices have been devised for use in automatically feeding water to boilers in order to maintain in the boiler a predetermined water level. These devices, however, have for the most part been unsatisfactory and not positive in operation, so as to require continual supervision.

In accordance with this invention an automatic device is provided which is operated by the steam created in the boiler to automatically open a valve to permit the water to flow into the boiler until the valve is operated by the raising of the water to this level to close off the steam supply to prevent further flowing of water into the boiler. In order to control the operation of this steam and reduce the pressure within the system so that the valve mounted in the flow line of water to the boiler may close when the water reaches a predetermined level, means are provided for condensing the steam to relieve the pressure practically at the instant that the water reaches the predetermined level.

In the accompanying drawing is diagrammatically illustrated one form of apparatus embodying this invention.

In the drawing, 1 illustrates a boiler which may be of any desired or preferred form. Connected with the boiler 1 is a pipe line 2 which leads to any suitable source of water under pressure, such, for example, as the pump 3 which pumps water from the supply main 4 through the pipe line 2 to the boiler 1. The pump 3 is connected with a steam engine 4a which is supplied with steam through a line 5 which connects with the head 6 of the boiler 1. Mounted within the line 5 is a valve 7.

Means are provided for actuating the valve 7 when the water level within the boiler 1 drops below a predetermined level, such as is indicated by the dotted line 8, and

which means are preferably of the following construction:

Connected with the boiler 1 is a float chamber 9 in which a float 10 is mounted. The float 10 is operably connected through a rod 11 with a valve 12 mounted in a pipe 13 which may be connected in the line 5 with the steam in the boiler 1. The float chamber 9 is connected by means of a pair of pipes 14 and 15 into upper and lower levels of the boiler 1, and a sight gauge 16 is connected across the pipes 14 and 15 so that the level in the boiler 1, sight gauge 16 and float chamber 9 will at all times be the same. The float 10 is connected by means of the rod 11 with the valve 12 so that when the water level within the float chamber 9 drops below a predetermined level, as indicated by the dotted line 8, the valve 12 is opened to permit steam to flow through the pipe 13 to a condenser 17. The condenser 17 is connected by means of a pipe line 18 with a valve 19 which is herein illustrated as of the diaphragm type. The valve 19 is connected by means of a rod 20 with the actuating lever 21 of the valve 7 so that when steam is admitted to the diaphragm valve 19, the valve 7 is actuated to permit steam to flow from the boiler head 6 through the line 5 to the steam engine 4a to set the same in operation to pump water from the supply main 4 through the pipe 2 to the boiler 1.

As soon as the pump 3 pumps sufficient water into the boiler 1 to raise the water level to the level indicated by the dotted line 8, the float valve 10 is raised to close the valve 12. The condenser 17 condenses the steam in the line 18 to relieve the pressure on the diaphragm valve 19, which then operates to close the valve 7. Without the condenser 17, the steam pressure would be maintained for a considerable period of time in the line 18 and within the diaphragm valve 19 to maintain the valve 7 open, permitting the engine 4a to operate to pump water into the boiler 1 above the desired level, as indicated by the line 8.

The condenser 17 may be of any suitable or desirable form and is herein illustrated as comprising a body into which the steam

is admitted and within which a coil 22 is mounted which is connected with a source of cold water by means of a pipe 23, so that cold water is continuously circulating through the condenser 17 and out the pipe 24, which may be connected with the sewer or otherwise disposed of. Means are provided for draining the condenser 17 at intervals, which means preferably comprise a draw-off tap 25 which is provided with a valve 26.

Means are provided for adjusting the position of the float 10 so as to permit variation of the water level within the boiler 1 as desired, which means may be of any desired or preferred form and are herein illustrated as comprising a link 27 which is pivotally secured to the operating lever 28 of the valve 12 and is adjustably secured to the rod 11 by means of bolts 29, by means of which the length of the connection between the float 10 and operating handle 28 of the valve 12 may be varied to regulate the position the float 10 will occupy to maintain the valve 12 closed.

Although I have herein illustrated a pump 3 for pumping the feed water into the boiler 1, it will be obvious that in a low pressure boiler where the water pressure in the main 4 exceeds the boiler pressure, the valve actuating means 19 may be connected directly with a valve mounted in the main 4 and that the main 4 may be connected directly with the boiler 1.

Having fully described the preferred embodiment of my invention, it is to be understood that I do not wish to be limited to the exact details herein set forth, which may obviously be varied without departing from the spirit of my invention, as will be apparent from the appended claims.

I claim:—

1. In a boiler control device, the combination of means for supplying water to a boiler, valve means operatively connected with the said supply means, means for operating said valve means, means connecting the valve means with steam in the boiler, means mounted in the said connecting means and operable when the level of water in the boiler falls below a predetermined point to admit steam to the valve means, and means operative when the water level in the boiler reaches a predetermined point for condensing the steam to reduce the pressure on the valve operating means to arrest the flow of water to the boiler.

2. In a boiler control device, the combination of means for supplying water to a boiler, valve means operatively connected with the said supply means, means connecting the valve means with the boiler, means mounted in the said connecting means and operable when the level of water in the boiler falls below a predetermined point to admit steam to the valve means, and a con-

denser mounted in the valve and boiler connecting means.

3. In a boiler control device, the combination of a boiler, means for supplying the boiler with water, automatic control means for the water supply means including a float chamber, a float mounted in the chamber, a valve operatively connected with the water supply means, a second valve, means connecting the second valve with the float mounted in the float chamber, the said second valve being mounted in a steam line connected with the boiler and with automatic actuating means adapted to actuate the said first valve when steam is admitted to the steam line, and a condenser mounted in the steam line.

4. In a device of the class described, the combination of a boiler, a boiler water supply line, a pump, means connecting the pump with the source of water supply, a steam line connecting the boiler with a motor for driving the pump, a valve mounted in the steam line, a float chamber connected with the boiler, automatic valve actuating means, means connecting the automatic valve actuating means with the valve, a steam line connecting the boiler with the automatic valve actuating means, a valve mounted in the latter steam line, a float mounted in the float chamber, means connecting the float with the last named valve for opening and closing said valve on variation of the water level in the boiler, and a condenser for condensing the steam in the last named steam line when the float controlled valve is closed.

5. In a device of the class described, the combination of a boiler, a boiler water supply line, a pump, means connecting the pump with the source of water supply, a steam line connecting the boiler with a motor for driving the pump, a valve mounted in the steam line, automatic valve actuating means, means connecting the automatic valve actuating means with the valve, a float chamber connected with the boiler, a float mounted in the float chamber, a steam valve actuated by said float, a steam line connecting said valve and said automatic valve actuating means, and a condenser for condensing the steam in the last-named steam line when the float controlled valve is closed.

6. In a device of the class described, the combination of a boiler, a boiler water supply line, a pump, a steam line from said boiler to said pump, a control valve mounted in said pump steam line, a means for automatically actuating said control valve, a float chamber connected with said boiler, a float operatively mounted in said float chamber, a steam valve actuated by said float, a steam line connecting said float actuated valve and said means for automatically actuating said control valve, and a con-

denser for condensing the steam in the last named steam line when the float actuated steam valve is closed whereby a predetermined water level is automatically maintained in said boiler.

5 Signed at Los Angeles, California, this 20th day of January, 1927.

ALBERT D. GRIFFIN.

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