

No. 683,251.

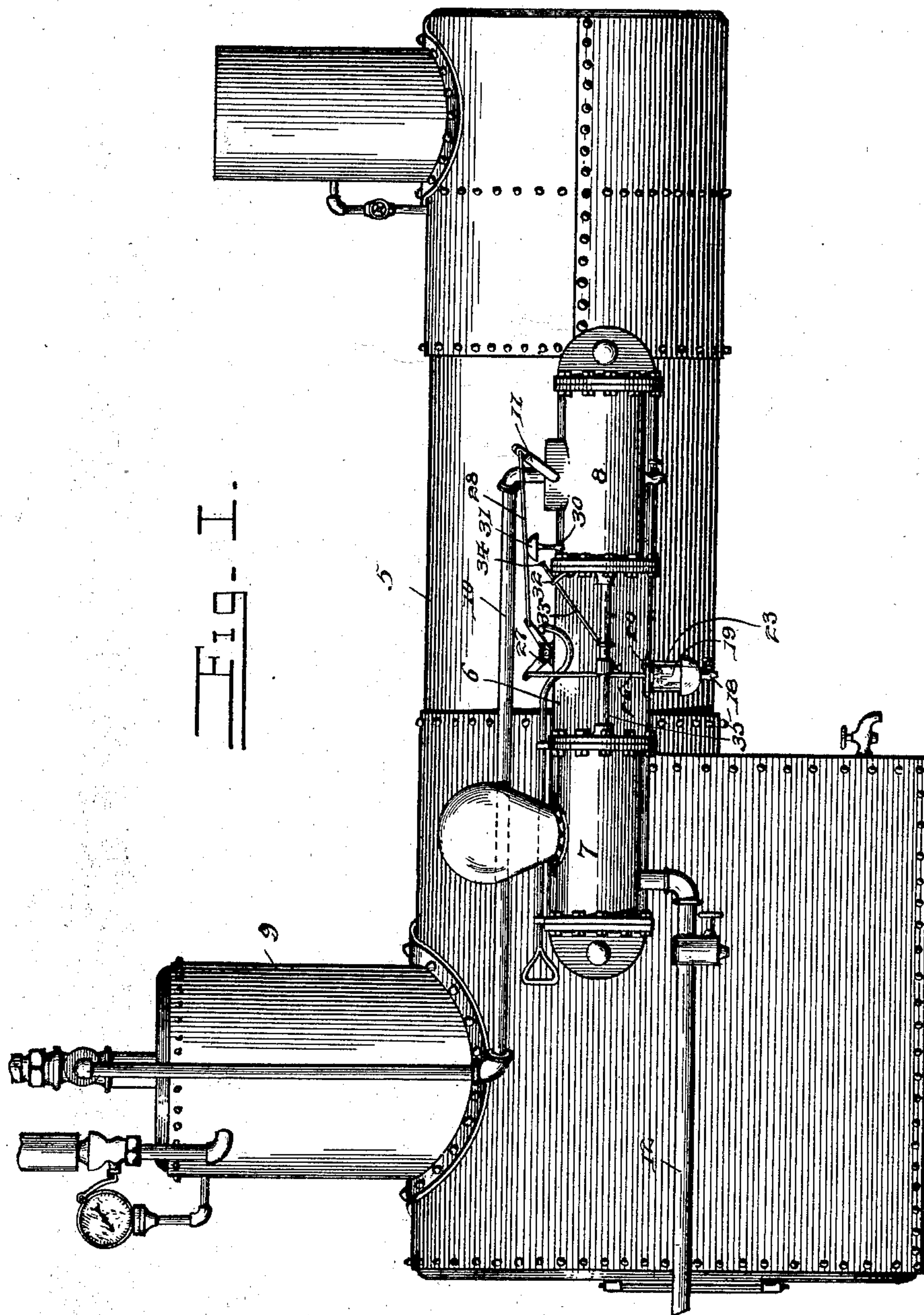
Patented Sept. 24, 1901.

C. B. CRABTREE.
FEED WATER REGULATOR AND ALARM.

(Application filed Apr. 13, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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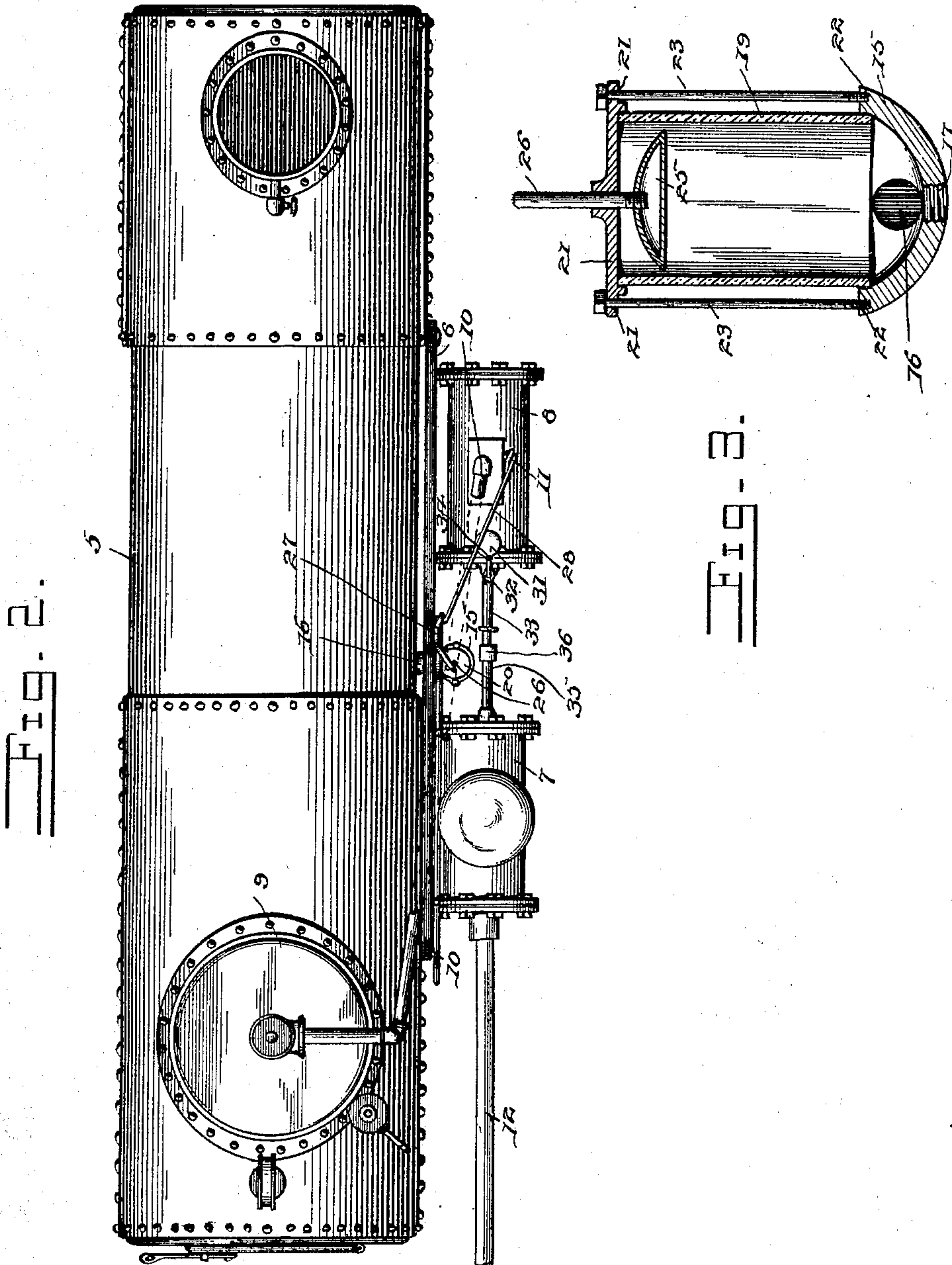
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UNITED STATES PATENT OFFICE.

CHARLES B. CRABTREE, OF MANCHESTER, ILLINOIS.

FEED-WATER REGULATOR AND ALARM.

SPECIFICATION forming part of Letters Patent No. 683,251, dated September 24, 1901.

Application filed April 13, 1901. Serial No. 55,708. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. CRABTREE, a citizen of the United States, residing at Manchester, in the county of Scott and State of Illinois, have invented a new and useful Feed-Water Regulator and Alarm, of which the following is a specification.

This invention relates to feed-water regulators and alarms designed for automatically regulating the supply of feed-water to a boiler and also for sounding an alarm when the feeding mechanism is thus brought into operation.

The object of the invention is to provide a simple and effective construction and arrangement in connection with a donkey-pump whereby when the water in the boiler is low the throttle of the pump will be opened and when the water has reached a certain height the throttle will be closed, and the pump will thus be started and stopped at the proper time.

A further object of the invention is to provide an alarm in connection with the donkey-pump and having operating mechanism which will be manipulated directly from the piston-rod of the pump.

In the drawings forming a portion of this specification and in which similar numerals of reference designate like and corresponding parts in the several views, Figure 1 is a side elevation showing a type of horizontal boiler with the mechanism of the present invention applied thereto. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is a vertical section of the float-box.

Referring now to the drawings, 5 represents a type of horizontal boiler, at one side of which is fixed a base-plate 6, supporting a donkey-pump comprising a water-cylinder 7 and a steam-cylinder 8, the latter having connection with the steam-dome 9 of the boiler through the medium of a supply-pipe 10, the supply of steam being regulated by a common form of oscillatory valve having an operating-lever 11 to open and close it. A suction-pipe 12 leads from any suitable water-supply to the cylinder 7 for supplying water thereto in the usual manner. In order to operate the throttle-valve of the pump under the influence of a rise and fall of the water in the boiler, a float mechanism is provided.

This float mechanism comprises a box, including a base 15, from one side of which leads a pipe 16, which communicates with the boiler, while an opening 17 is formed in the base and is provided with a waste-cock 18. Upon the base 15 is mounted a glass tube 19, the lower end of which is disposed within the inclosure of the base, and upon the upper end of the tube is placed a cap 20, having perforations 21, which align with threaded perforations 22 in the base and exteriorly of the tube 19. Passed through the perforations 21 and engaging the perforations 22 are screws 23, which act to clamp the cap firmly in place and hold the tube upon the base. Within the tube 19 is disposed a float 25, which may be of solid buoyant material or may be in the form of a hollow body, and connected with this float is a rod 26, passed outwardly through the cap 20. The outer end of the rod 26 is pivotally connected with one end of a bell-crank lever 27, pivoted upon an extension of the plate 6, and the opposite end of which lever is connected with the throttle-lever 11 through the medium of a connecting-rod 28. It will thus be seen that when the water is low in the boiler the float 25 will drop in the tube 19 and that when the water rises in the boiler the float will rise. This dropping of the float will act to rock the lever 27 in a direction to move the throttle-lever 11 and open the throttle-valve, while the upward movement of the float will rock the lever 27 in an opposite direction and will move the lever 11 to close the throttle, thus causing the pump to operate when the water runs low and to cut off the supply of water when the proper amount has been forced into the boiler. Mounted upon the cylinder 8 is an upright or bracket 30, having a gong 31 upon its upper end which is adapted to be sounded to indicate that the pump is in operation. In order to sound this gong, a guide-bracket 32 is attached to the head of the cylinder 8, and through this bracket is passed a reciprocatory rod 33, the upper end of which is provided with a clapper-head 34, while the lower end is bent to encircle the common piston-rod 35 of the cylinders 7 and 8. This end of the rod 33 which encircles the piston-rod is adapted to be struck by a block 36, adjustably mounted upon the piston-rod 35, whereby

it may be adjusted for proper operation. Thus as the rod 35 is reciprocated the rod 33 will be alternately pushed and released, with the result that it will be moved into and out of engagement with the gong 31, and will thus cause it to vibrate.

It will of course be understood that in practice any specific form of donkey-pump may be employed and that the apparatus described may be attached to a boiler of any style and for any purpose or may be operatively connected therewith without direct attachment.

To permit of operation of the pump-throttle by hand when desired, a rod 40 is slidably mounted in suitable guides on the cylinder 7 and the end thereof is bent around and to lie against the farther arm of the rocker 27, so that when the rod is pulled the rocker will be operated to open the pump-throttle and permit the pump to operate. This can be done without the engineer leaving his post.

In practice modifications of the specific construction shown may be made and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

What is claimed is—

1. The combination with a boiler, of a pump, a piston-rod forming part of the pump, a steam-supply between the boiler and pump and having a controlling-throttle, a float operated by the water in the boiler to open and close the throttle, an alarm, and means operatively connected to the piston-rod for operating said alarm.

2. The combination with a boiler, of a pump operatively connected thereto and adapted to feed to the boiler, a steam-supply leading from the boiler to the pump, a throttle in said steam-supply, a float-box connected with the boiler, a float therein, means for operatively

connecting the float and throttle, an alarm, a piston-rod forming part of the pump and a movable rod having one end disposed in operative relation to the alarm and its opposite end in operative relation to said piston-rod.

3. The combination with a boiler, of a transparent float-box having upper and lower connections with said boiler, a float in said box adapted to be raised and lowered by the water from the boiler, a feed-water pump having a discharge-pipe communicating with the boiler, a steam-pipe leading from the boiler to the pump, a throttle-valve controlling the steam-supply, mechanism operatively connecting the float to the throttle-valve, an alarm, and mechanism operatively connecting the piston-rod of the pump to said alarm.

4. The combination with a boiler, of a float-box connected therewith, a float in said box, a pump having as one of its elements a piston-rod 35, a discharge-pipe leading from the pump to the boiler, a steam-supply pipe leading from the boiler to the pump, a throttle controlling said steam-supply, a lever 11 on said throttle, bell-crank lever 27 pivoted to a fixed point and having its arms connected respectively to the float and to the lever 11, an alarm 31, a movable rod 33 for operating the same, said rod 33 being reciprocated by the piston-rod of the pump, and a hand-lever arranged for operative connection with the mechanism connecting the float and the throttle-valve, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES B. CRABTREE.

Witnesses:

J. A. MARSH,
LOUIS MARSH.