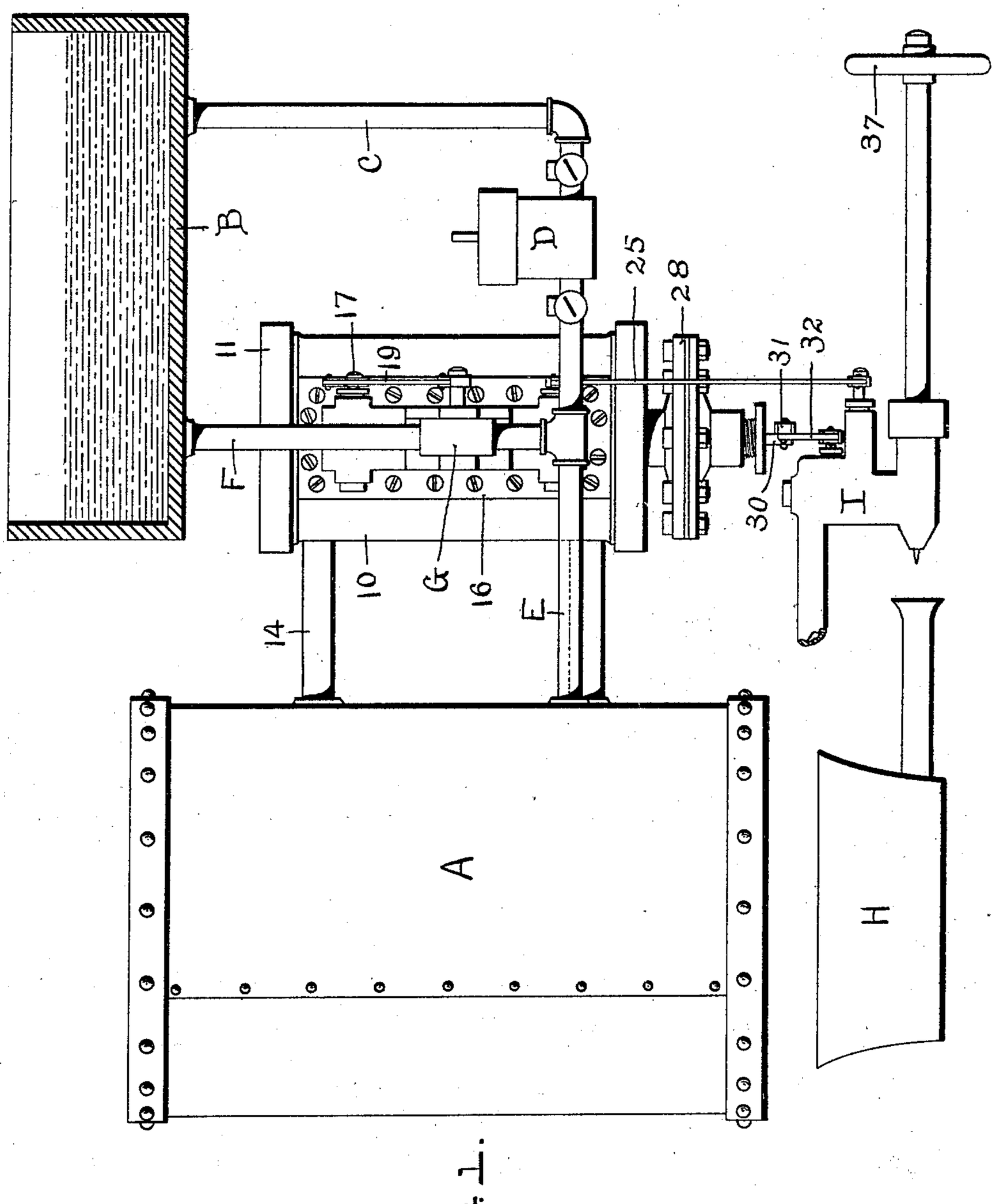
No. 671,598. Patented Apr. 9, 1901.

R. JANNEY.

AUTOMATIC REGULATOR FOR STEAM BOILERS.

(Application filed Dec. 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.



Witnesses;

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FIG. 3.

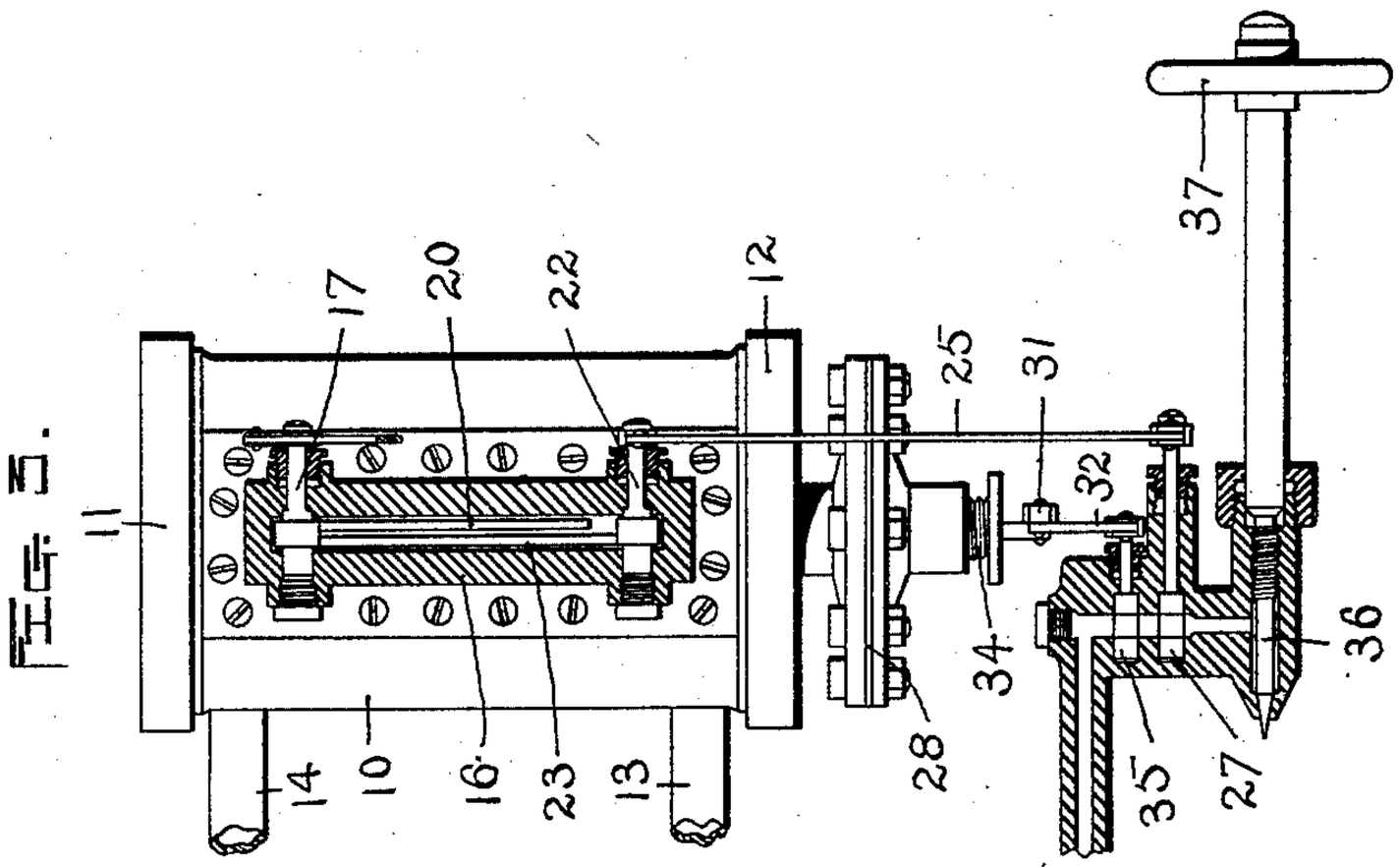
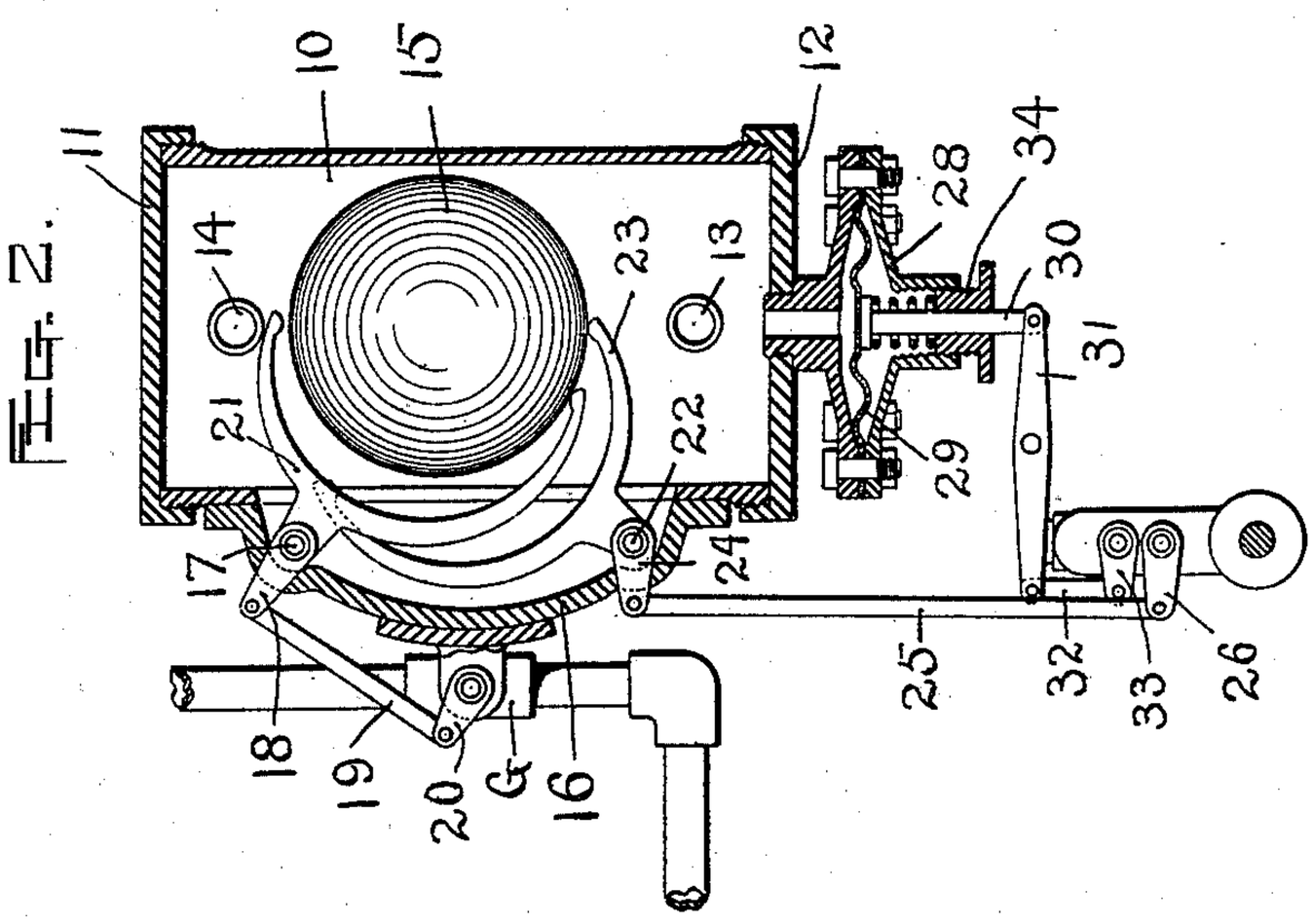


FIG. 2.



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UNITED STATES PATENT OFFICE.

REYNOLD JANNEY, OF KEENE, NEW HAMPSHIRE.

AUTOMATIC REGULATOR FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 671,598, dated April 9, 1901.

Application filed December 22, 1899. Serial No. 741,213. (No model.)

To all whom it may concern:

Be it known that I, REYNOLD JANNEY, a citizen of the United States, residing at Keene, in the county of Cheshire and State of New Hampshire, have invented a new and useful Automatic Regulator for Boilers, of which the following is a specification.

The object of my present invention is to provide a simple, efficient, inexpensive, and durable automatic regulator for steam-boilers.

An automatic boiler-regulator constructed according to my invention has been designed for use in connection with the steam-generator for a motor-vehicle; and the especial object of this invention is to provide a single automatic regulator which will shunt the water from the pump back into the feed-water tank when the water in the boiler rises above a desired level and which will cut off the fuel-supply when the water in the boiler falls below a desired level.

To these ends a boiler-regulator constructed according to this invention consists of the parts and combinations of parts, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a diagrammatic view of a boiler provided with an automatic regulator constructed according to this invention. Fig. 2 is a transverse sectional view of the automatic regulator, and Fig. 3 is a side view of the automatic regulator partially broken away.

An automatic regulator constructed according to this invention in its simplest form comprises a float, coöperating with which is a pair of contact-arms arranged to engage opposite sides of the float and to be turned thereby, so that the float may pass from between them, whereby the contact-arms will be operated by a short traverse of the float, but will not interfere with the continuation of the travel of the float after having been operated thereby.

Referring to the arrangement of parts illustrated in Fig. 1, A designates a boiler of any ordinary or approved construction. B designates the feed-water tank, and D designates a pump. The water from the feed-water tank B passes to the pump D through a pipe C and is normally forced into the boiler through the feed-pipe E. A shunt-pipe F returns from the feed-pipe E to the feed-water tank B, and located in the shunt-pipe F is a valve G, which is controlled by the automatic regulator, as hereinafter explained, so that while the valve G is closed the pump will continue to force water into the boiler A; but when the valve G is opened the water from the pump will be shunted back through the pipe F and returned to the feed-water tank B. Arranged below the boiler A is a gasolene or similar burner H, which may be supplied with fuel from a valve-casing I, the valve-casing I being provided with a hand-controlled valve and the other automatically-controlled valves for shutting off the supply of fuel when the water in the boiler falls below a desired level or when the pressure in the boiler rises above a desired limit.

The preferred construction of my automatic regulator is most clearly illustrated in Figs. 2 and 3. As shown in these figures, the regulator comprises a casing consisting of a cylindrical body portion 10, having top and bottom caps 11 and 12. Screwed onto the side of the cylindrical body portion 10 is a chambered casting or piece 16. The upper and lower ends of the body portion are connected to the boiler by pipes 14 and 13. Journaled in the upper part of the chambered casting 16 is a rock-shaft 17, which extends to the outside of the chambered casting, as shown most plainly in Fig. 3. Secured on the end of the rock-shaft 17 is a crank-arm 18, which is connected by a link 19 to operate the crank-arm 20, which controls the shunt-valve G. Secured on the rock-shaft 17 so as to project into the cylindrical body portion of the regulator is a pair of substantially caliper-shaped contact-arms 21. The caliper-shaped contact-arms 21 are arranged to engage opposite sides of a float-ball 15, and the caliper-shaped contact-arms are preferably mounted so that as the float-ball rises it will operate said contact-arms to open the shunt-valve G through the connection described. When the float-ball 15 falls, the caliper-shaped contact-arms 21 will be moved in the opposite direction to close the shunt-valve G, and as the float-ball continues to descend the parts are preferably arranged so that the caliper-shaped contact-arms 21 will be swung back into the cham-

bered casting 16, allowing the float-ball to pass from between said contact-arms. By means of this construction the shunt-valve G may be operated by a comparatively short traverse of the float-ball, and the contact-arms will not interfere with the continuation of the travel of the float after having been operated thereby. Journaled in the lower part of the chambered casting 16 and extending to the outside thereof, as shown in Fig. 3, is a second rock-shaft 22, having a crank-arm 24 connected by a link 25 to a crank-arm 26, which turns with a fuel-controlling valve 27. Secured on the rock-shaft 22 and extending into the cylindrical body portion 10 of the regulator is a second pair of caliper-shaped contact-arms 23, which are arranged to be operated by the float-ball 15 to close the valve 27 when the float-ball falls and to open said valve as the float-ball rises, the contact-arms 23 being shaped to be swung back into the chambered casting 16 as the float-ball rises, so that the float-ball may pass from between said contact-arms and so that said contact-arms will not interfere with the continuation of the upward travel of said float-ball. Connected to the lower part of the cylindrical body portion 10 is a diaphragm-casing 28, and mounted in the diaphragm-casing 28 is a flexible diaphragm 29, arranged to act on a plunger 30, which is pivotally connected to a lever 31, the opposite end of said lever 31 being connected by a link 32 to a crank-arm 33, which turns with a fuel-shut-off valve 35. The diaphragm 29 is normally supported by a coiled spring the tension of which may be adjusted by a threaded piece 34, so that by adjusting the tension of this spring the parts may be adjusted to cut off the fuel-supply when the pressure in the boiler rises above any desired limit.

In the use of an automatic regulator constructed according to this invention the rising of the float 15 will automatically open the shunt-valve G to shunt the water from the pump back to the feed-water tank when the water in the boiler rises above a desired level, and the falling of the float 15 will automatically shut off the fuel-supply from the burner when the water in the boiler falls below a desired level. At the same time, through an independent set of connections, the diaphragm 29 will act to shut off the fuel-supply when the pressure in the boiler rises above a desired limit.

By using a regulator of this construction in connection with the steam-generator of a motor-vehicle I am enabled to provide for the perfect and automatic control of the boiler, so that the entire attention of the person using the motor-vehicle may be given to other parts. I am aware, however, that certain features of my invention, as expressed in the broad claims at the end of this specification, may be employed to advantage in other locations besides in triple-acting boiler-regulators alone. For example, certain parts of the regulator herein illustrated may be omitted, and the remaining parts may still be used to advantage to perform one or more of the functions of the complete regulator. I do not desire, therefore, to be limited to the construction herein shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a regulator for steam-boilers, the combination of a float, and a pair of contact-arms coöperating with said float, said contact-arms being arranged to engage opposite sides of the float and to turn so that the float may pass from between them, whereby the contact-arms will be operated by a short traverse of the float, but will not interfere with the continuation of the travel of the float after having been operated thereby, substantially as described.

2. In a regulator for steam-boilers, the combination of a casing, pipes connecting the upper and lower part of the casing with the boiler, a float-ball mounted in the casing, a rock-shaft journaled in and extending to the outside of the casing, and a pair of caliper-shaped contact-arms carried by said rock-shaft and arranged to engage opposite sides of the float, and to be turned so that the float may pass from between them whereby the contact-arms will be operated by a short traverse of the float, but will not interfere with the continuation of the travel of the float after having been operated thereby, substantially as described.

3. In an automatic regulator for boilers, the combination of a casing, comprising a cylindrical body portion, and a chambered casting secured on the side of the cylindrical body portion, a float-ball mounted in the cylindrical body portion, and a pair of contact-arms coöperating with said float-ball, being arranged to be turned back into the chambered casting, so that the float-ball may pass from between them, whereby said contact-arms will be operated by the short traverse of the float, but will not interfere with the continuation of the travel of the float after having been operated thereby, substantially as described.

4. The combination of a boiler, a feed-water tank, a pump for forcing water from the feed-water tank into the boiler, a burner for heating the boiler, and a single automatic regulator comprising a casing, a float mounted in the casing, and two pairs of contact-arms arranged to engage opposite sides of the float, one pair of contact-arms being connected to shunt the water from the pump back into the tank when the water in the boiler rises above a desired level, and the other pair of contact-arms being connected to shut off the supply of fuel when the water falls below a desired level, substantially as described.

5. The combination of a boiler, a feed-water tank, a pump for forcing water from the tank into the boiler, a burner for heating the boiler, and a single automatic regulator comprising

a casing, a float-ball mounted in the casing, a rock-shaft journaled in, and extending to the outside of the casing, connections controlled by said rock-shaft for shunting the water from the pump back into the feed-water tank, a pair of contact-arms mounted on said rock-shaft to engage opposite sides of the float-ball, a second rock-shaft journaled in, and extending to the outside of the casing, connections controlled from said rock-shaft for shutting off the fuel-supply, and a second pair of contact-arms mounted in the second rock-shaft and arranged to engage opposite sides of the float-ball, said contact-arms being arranged to be turned back into the chambered casting to permit the float-ball to pass from between them, whereby said contact-arms will be operated by a short traverse of the float-ball, but will not interfere with the continuation of the travel of the float-ball after having been operated thereby, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

REYNOLD JANNEY.

Witnesses:
O. E. CAIN,
A. T. BATCHELDER.