

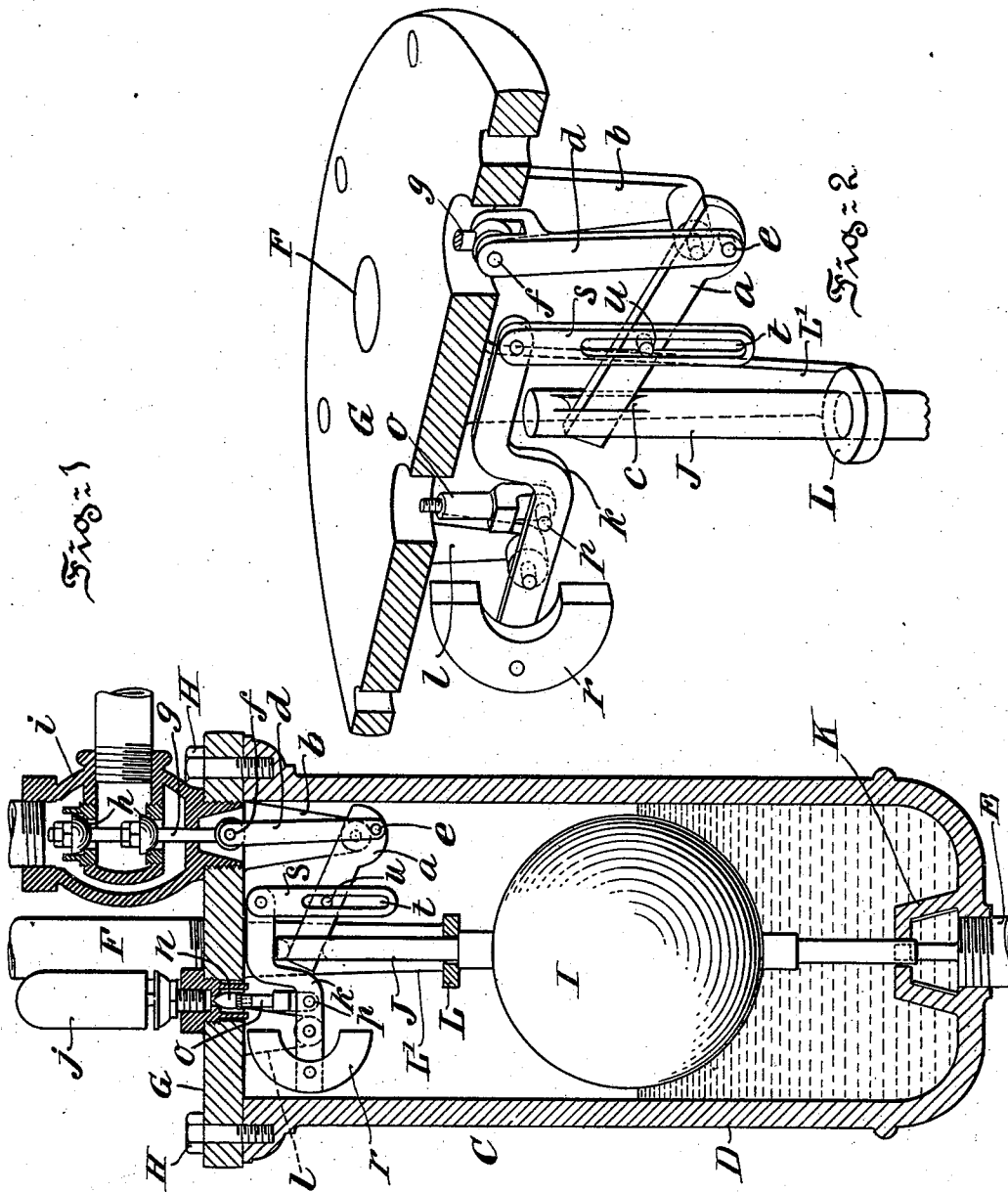
(No Model.)

2 Sheets—Sheet 1.

A. E. BURROWS & W. E. CLARK.
AUTOMATIC FEED WATER REGULATOR.

No. 574,861.

Patented Jan. 5, 1897.



Witnesses:

W. H. Schaefer
Craig Shields

Inventors

A. E. Burrows
W. E. Clark
by their attorney
Chas. A. Rutter

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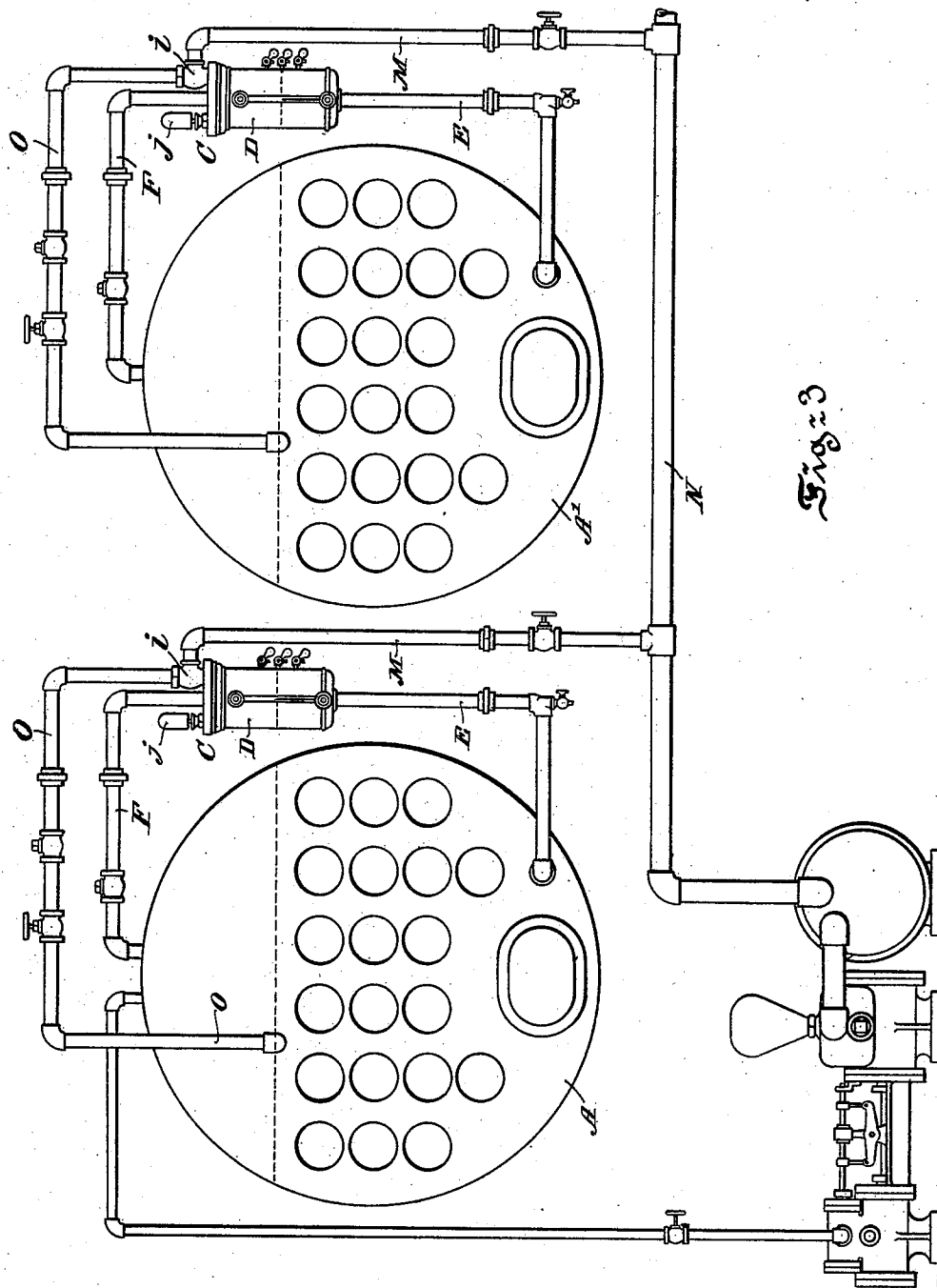


Fig. 3

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UNITED STATES PATENT OFFICE.

AMOS E. BURROWS AND WALTER E. CLARK, OF PICTURE ROCKS, PENNSYLVANIA, ASSIGNORS OF ONE-THIRD TO THE E. KEELER COMPANY, OF WILLIAMSPORT, PENNSYLVANIA.

AUTOMATIC FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 574,861, dated January 5, 1897.

Application filed February 28, 1896. Renewed November 17, 1896. Serial No. 612,527. (No model.)

To all whom it may concern:

Be it known that we, AMOS E. BURROWS and WALTER E. CLARK, citizens of the United States, and residents of Picture Rocks, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Feed-Water Regulators, of which the following is a specification.

Our invention relates to improvements in devices for automatically controlling the feed of water to steam-boilers; and the object of our invention is to furnish a device operated by the rising or falling of the water in a steam-boiler which will automatically and positively control the flow of water under pressure from a pump which is constantly in operation, or a stand-pipe, for instance, to the boiler in such manner that the water-level in the boiler will always remain practically at the same level.

In the accompanying drawings, forming part of this specification, and in which similar letters of reference indicate similar parts throughout the several views, Figure 1 is a central sectional elevation of our device for controlling the flow of water under pressure to a boiler; Fig. 2, a perspective view of part of the head or cover of the shell or case of our water-controlling device, showing the several operating-levers, &c., carried thereby; and Fig. 3, an end elevation of a battery of boilers fitted with our device and a common pump for supplying water thereto.

A A', Fig. 3, are steam-boilers; B, a pump which is in constant operation for supplying water to the boilers.

Instead of the pump B any other means may be used for supplying water under pressure to the boilers, a stand-pipe, a raised reservoir, or any other means; but for convenience we will describe our device in connection with a pump.

C is our device for controlling the flow of water to the boiler. This device consists of a shell or case D, the lower part of which is connected by means of a suitable pipe E with the water-space of the boiler, and the upper part of which is connected with the steam-space of the boiler by means of a suitable pipe

F. The pipe F preferably passes through a head G, which closes the upper part of shell D and which is secured thereto by means of bolts H, Fig. 1, or otherwise. The shell D is placed at the side or end of the boiler, and as this shell is connected with the steam and water spaces of the boiler the water in the former always stands at the same level as the water in the latter and any change of level of the water in the boiler is immediately followed by a corresponding change of the water in the shell.

I is a float within shell D; J, a stem carried by float I. This stem passes through guides K L, the former at the bottom of the shell, the latter preferably carried by a downwardly-projecting arm L', carried by the top plate or cover G. These guides insure a vertical movement of the float and stem.

a is a lever pivotally attached to a bracket b, carried by the cover G. The inner or free end of this lever is connected to the upper end of stem J, the stem J being preferably furnished with a slot c, (best shown in Fig. 2,) through which this lever passes. d is a link pivotally connected at e to lever a. The upper end of link d is pivotally connected at f to the lower end of the stem g of a balanced valve h, which is inclosed within a casing i, which is screwed into the cover G.

From the valve-casing i a water feed-pipe M passes down to the main feed-pipe from the pump or other water-supply, and from the upper part of this casing passes a pipe O, through which the water is fed to the boiler.

The operation of this part of the device is as follows: The water in the boiler and in the shell D falls, and with it float I and stem J, which draws down inner end of lever a, raising the link d and valve h, permitting the flow of water from the main pipe N through pipe M to the valve-casing i, from which it passes through pipe O to the boiler. As the water-level in the boiler rises it is followed by a corresponding rise of the water in the shell D, which lifts the float I, which lifts the inner end of the lever a, drawing down the outer end of this lever, the link d, the valve-stem g, and seating the valve h, thereby stopping the flow of water through this valve.

The opening of the valve *h* takes place whenever the level of the water in the boiler falls below a certain point and its closing as soon as the proper level is again established.

5 We prefer to use the balanced valve *h* for controlling the flow of water to the boiler, because a valve of this construction may be operated with less power than that of another construction. We do not desire, however, to
10 confine ourselves to this particular construction of valve.

In addition to the mechanism above described we have furnished the shell *D* with a low-water alarm, which is sounded in case
15 the above mechanism fails to act and the water in the boiler falls below a predetermined point.

j is a whistle which is screwed into the head *G*; *k*, a lever pivoted upon a bracket *l*, which is
20 carried by the head *G*. *n* is a valve controlling the admission of steam to the whistle. This valve is preferably of the plug pattern, as shown, and is carried on a stem *o*, which is pivotally attached to lever *k* at *p*.

25 *r* is a counterweight upon the outer end of lever *k*, which draws this end of this lever downward and normally keeps the valve *n* closed.

s is a link pivotally attached to the inner
30 end of lever *k*; *t*, a slot in this link; *u*, a pin carried by lever *a* and passing through slot *c*.

If the water-controlling devices fail to act and the water continues to fall, the pin *u* presently engages and lowers the link *s*, which
35 draws down the inner end of lever *k*, and the valve *n* is opened and the whistle sounded.

All the working parts of the device with the exception of the float and stem are carried by the head *G*, and if repairs or adjustments are to be made at any time they can
40 all be reached by simply removing the head from the shell.

The device may be used upon a single boiler or upon a battery of boilers. In the
45 latter case each boiler is fitted with one of our devices, each device receiving water from a common water-supply in which the water is under pressure.

Having thus described our invention, we
50 claim—

1. In a device for automatically controlling

the flow of water under pressure to a steam-boiler, in combination, a shell or case, a removable head closing the top of said shell or case, a connection leading from the bottom
55 of said shell or case to the water-space of a boiler, a connection leading from the top of said shell or case to the steam-space of a boiler, a valve-case and valve carried by said removable head, a connection leading
60 from said valve-case to a water-supply, a connection leading from said valve-case to the boiler, a float within said shell, a vertical stem carried by said float, a pivoted lever one end of which is adapted to be engaged and oper-
65 ated by said stem as said float rises and falls, and a link one end of which is pivotally connected to said lever and the other end of which is pivotally connected to the stem of the valve within the valve-casing carried by the
70 removable head of the shell or case.

2. In a device for automatically controlling the flow of water under pressure to a steam-boiler, in combination, a shell or case, a removable head carried by said shell or case,
75 a connection leading from the bottom of said shell or case to the water-space of the boiler, a connection leading from the top of said shell or case to the steam-space of the boiler, a valve-case carried by the removable head, a
80 balanced valve within said case, a connection leading from said valve-case to a water-supply, a connection leading from said valve-case to the boiler, a vertically-moving float within said shell, a vertical stem carried by said float,
85 a guide carried by the lower part of said shell for the lower part of said stem, a guide carried by said removable head for the upper part of said stem, a downwardly-extending bracket carried by said removable head, a lever pivoted to said bracket one end of which
90 is adapted to be engaged and operated by the upper part of said float-stem, and a link one end of which is pivotally attached to said lever and the other to the stem of the balanced
95 valve.

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