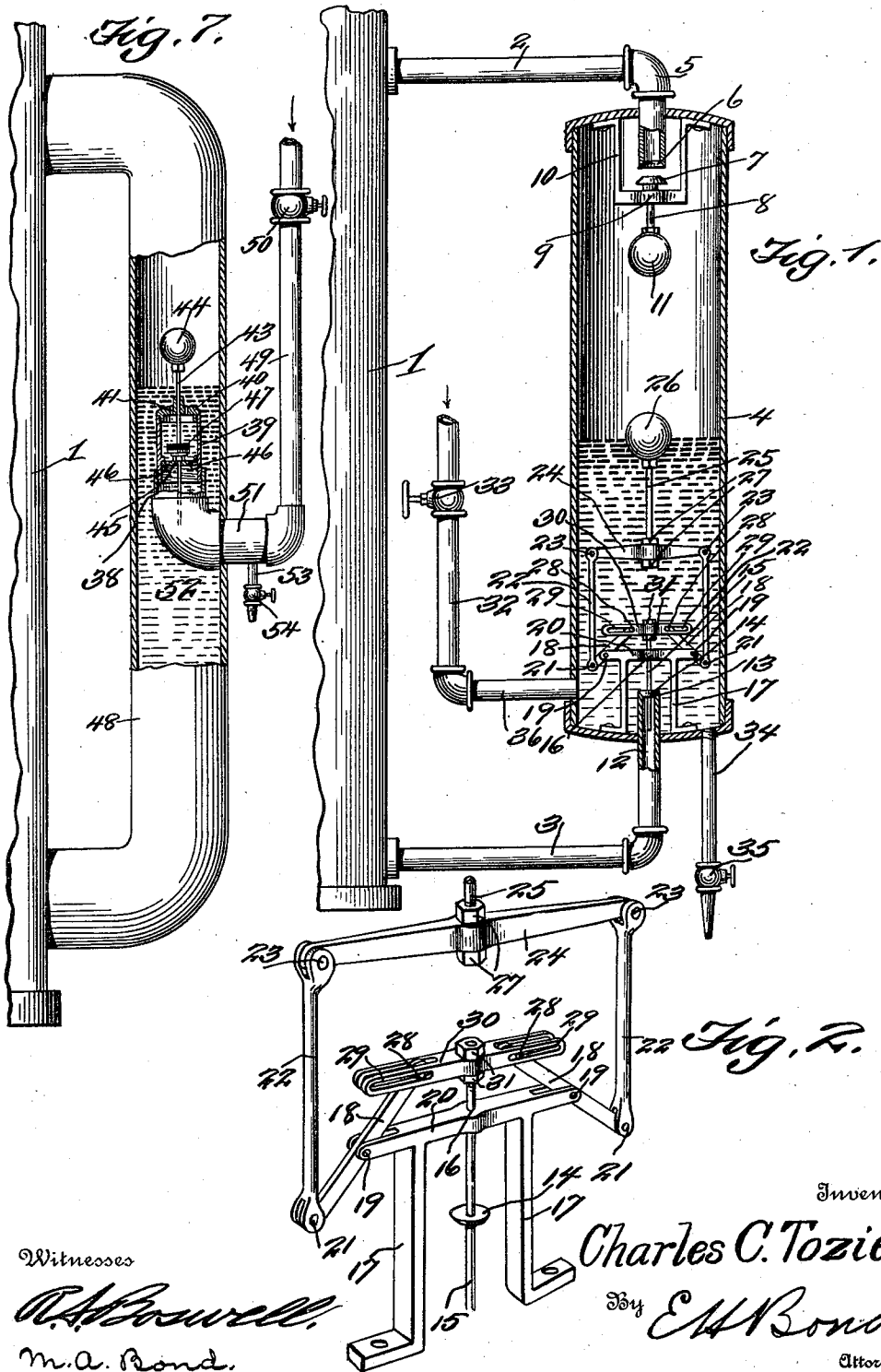


C. C. TOZIER.
 AUTOMATIC CUT-OFF FOR BOILER FEEDERS.
 APPLICATION FILED JAN. 10, 1911.

1,013,463.

Patented Jan. 2, 1912.

2 SHEETS—SHEET 1.



Witnesses

A. Bowell.
M. A. Bond.

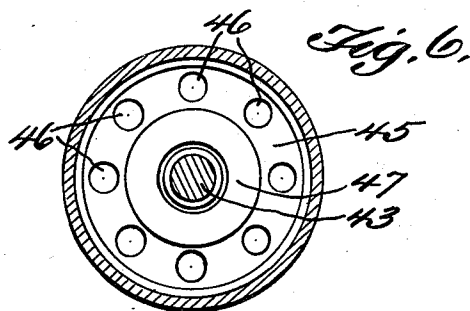
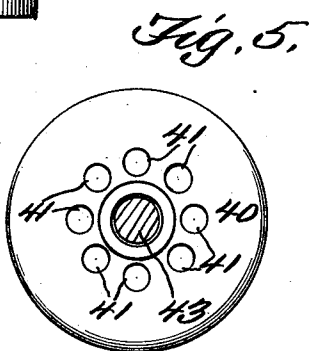
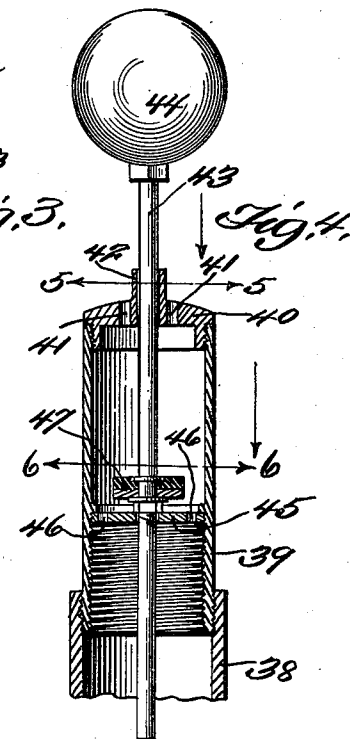
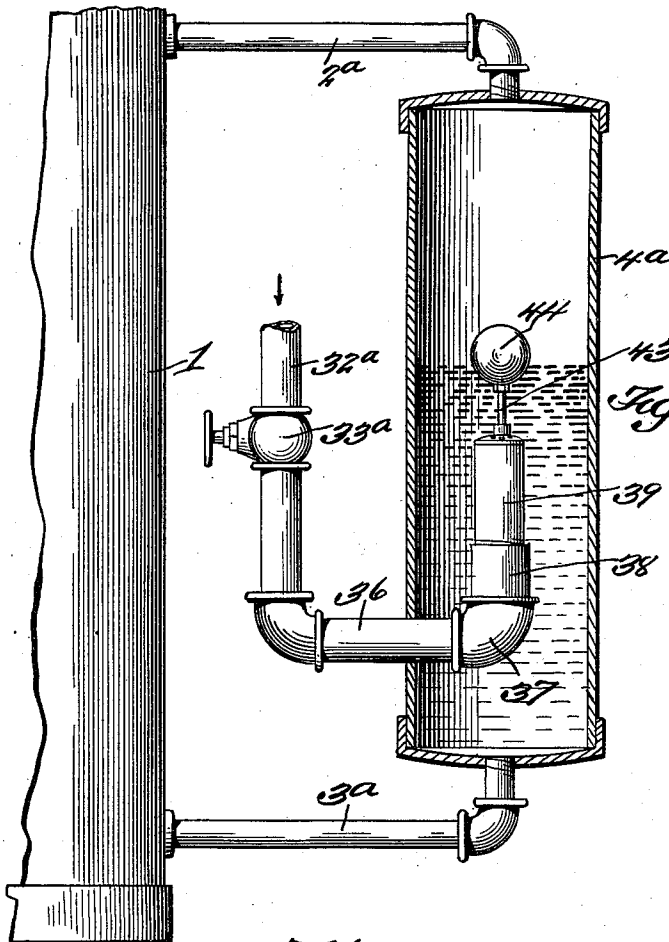
Inventor
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 Attorney

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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES C. TOZIER, OF SKOWHEGAN, MAINE.

AUTOMATIC CUT-OFF FOR BOILER-FEEDERS.

1,013,463.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed January 10, 1911. Serial No. 601,814.

To all whom it may concern:

Be it known that I, CHARLES C. TOZIER, a citizen of the United States of America, and resident of Skowhegan, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Automatic Cut-Offs for Boiler-Feeders, of which the following is a specification.

This invention relates to certain new and useful improvements in automatic cut-offs for boiler feed devices and it has for its objects among others to provide a simple yet efficient and durable automatic feed mechanism embodying means for automatically stopping the flow of water to the boiler at predetermined times.

The device may be set for any height of water in the boiler and will automatically control the flow when such height is reached.

I aim further at improvements in the details of construction whereby the best results are attained, and this with simple means, not liable to get out of order and readily repaired if occasion may require.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is capable of embodiment in a variety of forms, some of the most desirable of which I have herein illustrated. Such forms are clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a substantially central vertical section through my improvement with parts in elevation and portions broken away in order to better show the construction. Fig. 2 is an enlarged perspective detail of the valve controlling mechanism. Fig. 3 is a substantially central vertical section with parts in elevation, showing a modified form. Fig. 4 is an enlarged detail of the float and valve mechanism shown partly in elevation and partly in section. Fig. 5 is a transverse section on the line 5—5 of Fig. 4 looking in the direction of the arrow. Fig. 6 is a transverse section on the line 6—6 of Fig. 4 looking in the direction of the arrow. Fig. 7 is an elevation with portions broken away and parts in section, showing substantially another form of embodiment of the invention.

Like numerals of reference indicate like parts throughout the different views.

Referring to the drawings, 1 designates a

boiler, and, referring first to Fig. 1, 2 is a pipe connected with the steam spaces thereof and 3 a pipe connected with said boiler near the bottom.

4 is a cylinder and 5 a pipe connected with the pipe 2 and extending downward through the top of the cylinder 4 within the same and at its lower end provided with a valve seat 6. 7 is a valve carried by a valve stem 8 working through a guide 9 on the depending member 10, the lower end of this valve stem carrying a float 11. This valve controls the flow of steam through said pipe 2.

Extending up within the bottom of the cylinder 4 is a pipe 12 connected with the pipe 3 and having at its upper end a valve seat 13 against which is designed to be seated a valve 14 carried by a valve stem 15 guided by a suitable guide 16 on the bracket or the like 17 secured to the lower end of the cylinder.

18 are levers pivotally mounted at 19 intermediate their ends in the bifurcated ends of the cross bar 20 on the support 17, their outer ends being pivotally connected as at 23 with the ends of a bar 24 in which is adjustably supported a screw threaded rod 25 carrying at its upper end a float 26. Nuts 27 on this rod serve to adjust the float 26 up and down in order that the device may be set to act at any predetermined height of water in the boiler. The other ends of the levers 18 carry pins 28 which work in slots 29 of the bifurcated ends of the horizontal bar 30 adjustably connected with the upper end of the valve stem 15, as seen best in Fig. 2.

31 are nuts on the screw threaded stem 15 providing for the necessary adjustment of said stem and, consequently, of the valve 14 carried thereby.

32 is a pipe entering the lower end of the cylinder 4 and designed to be connected with any suitable source of water supply. It is provided with a suitable valve 33 whereby the flow of water may be controlled and entirely shut off when desired.

34 is a drain pipe secured in the lower head of the cylinder 4 and provided with a suitable valve 35 for obvious purposes.

In operation, as the float 26 rises it forces downward, by means of the links and levers and pivotal connections above described, the valve 14 until the latter is seated upon its seat, thus stopping the flow of water into the pipe 3 feeding the boiler. The water then

entering the cylinder 4 through the pipe 32 gradually fills the cylinder 4 and as it rises it acts upon the upper float 11 and forces the valve 7 to its seat 6, thus shutting off the steam and the steam pressure, holding the valve tightly to the seat and cutting off and preventing the flow into the boiler.

The construction above described, as well as the forms now to be described, constitute efficient means for preventing the flooding of boilers and radiators.

The improvement herein described is intended for use in connection with heating boilers where low pressure is carried, but in all cases the water supply must be greater than the boiler pressure.

The principle of the invention may be embodied in a structure employing but one float. Such a form is illustrated in Figs. 3, 4, 5 and 6. In this form the tank 4^a is connected at the upper end by pipe 2^a with the boiler and at the bottom by pipe 3^a. 32^a is the supply pipe to the tank, 33^a being a valve in such pipe. This pipe is connected at its lower end by the horizontal pipe 36, which extends through an opening in the side wall of the tank, with an elbow 37 within said tank, from which elbow rises the pipe 38, the upper end of which is internally screw threaded and into which is threaded the lower end of a cylinder 39. The upper end 40 of this cylinder is provided with a plurality of openings 41 about its center and rising from this top 40 is a nipple 42 which forms a guide for the upper end of the rod 43 which carries at its upper end a float 44, the lower end of the rod being guided in a plate 45 closing the lower end of the cylinder and provided with openings 46 near its periphery. On this rod 43 between the head 40 and the bottom plate 45 is a valve 47. In this form the inlet holes 46 are disposed outside of the periphery of the valve allowing the water to flow into the cylinder 39, through the pipe 32^a—36 and flowing out through the openings 41 in the top into the tank 4^a. As the water rises in the tank 4^a, the float 44 will rise and as the valve 47 reaches the top of the cylinder 39 it closes the said openings 41 and the pressure will thus be held until released by the operator. It will be noted that when both the bottom and top of the cylinder are closed nothing can enter the boiler and the pressure will keep both the top and bottom closed until released by the operator. The bottom plate 45 may be adjusted vertically within the cylinder 39, so that the device may operate any predetermined height of water. Substantially the same embodiment of the invention is shown in Fig. 7 except that the tank 48 has its ends connected directly with the boiler, as shown, and the pipe 49 has the valve 50 while the horizontal connection 51 between the pipe 49 and the elbow 52 has a

drain pipe 53 with a valve 54 for obvious purposes. In this construction the cylinder 39 with its openings and the rod 43 with its float 44 and valve 47 are the same as in the form shown in Figs. 3 and 4 and the operation is substantially the same.

From the above it will be seen that I have devised a simple and efficient construction for accomplishing the ends in view, and while the structural embodiments of the invention as hereinbefore disclosed are what I at the present time consider preferable, it is evident that the same is subject to changes, variations and modifications in detail, proportion, arrangement of parts etc., without departing from the spirit of the invention or sacrificing any of its advantages. I, therefore, do not wish to restrict myself to the particular construction, arrangement of parts, etc., as above described, but reserve the right to make such changes, variations and modifications as come properly within the scope of the protection prayed.

What is claimed as new is:—

1. In an automatic boiler feeder cut-off, a receptacle having connections at its opposite ends with a boiler, a source of supply to said receptacle, a vertically floatable valve controlling the outflow from said receptacle and a float and connections within said receptacle for controlling said valve.

2. In an automatic boiler feeder cut-off, a receptacle having connections at its opposite ends with a boiler, a source of supply to said receptacle, a valve controlling the outflow from said receptacle, a float and connections within said receptacle for controlling said valve, and a supplemental float actuated valve and loose pivotal connections between the same and the float for controlling the connection at the upper end of the receptacle.

3. In an automatic boiler feeder cut-off, a receptacle having connections at the top and bottom of the boiler, a supply pipe for said receptacle, a vertically floatable valve controlling the outflow from the receptacle, a stem for said valve, a float, a member carrying the float and pivoted loosely connected vertically floatable link and lever connections between the same and the said stem.

4. In an automatic boiler feeder cut-off, a receptacle having connections at the top and bottom with a boiler, a supply pipe to said receptacle, a valve controlling the outflow from the receptacle, a guide for the valve stem, a float, a member by which the same is carried, links pivoted to said member, pivotally mounted levers connected with said links, and connections between said levers and the valve stem.

5. In an automatic boiler feeder cut-off, a receptacle having connections at the top and bottom with a boiler, a supply pipe to said receptacle, a valve controlling the out-

flow from the receptacle, a guide for the valve stem, a float, a member by which the same is carried, links pivoted to said member, pivotally mounted levers connected with said links, and connections between said levers and the valve stem, said last-named connections being slidable.

6. In an automatic boiler feeder cut-off, a receptacle having connections at the top and bottom with a boiler, a supply pipe to said receptacle, a valve controlling the out-flow from said receptacle, a stem carrying the same, a support within the receptacle having a guide for the stem, levers pivotally mounted on said support, links pivotally connected with the outer ends of the levers, a float, a member carrying the same and pivotally connected with the links, and a member connected with the valve stem and having elongated slots, the said levers having pins working in said slots.

7. In an automatic boiler feeder cut-off, a receptacle having connections at the top and bottom with a boiler, a supply pipe to said receptacle, a valve controlling the out-flow from said receptacle, a stem carrying the same, a support within the receptacle having a guide for the stem, levers pivotally mounted on said support, links pivotally connected with the outer ends of the levers, a float, a member carrying the same and pivotally connected with said links, a member connected with the valve stem and having elongated slots, said levers having pins working in said slots, and a drain pipe for said receptacle.

Signed by me at Skowhegan Maine this sixth day of January 1911.

CHARLES C. TOZIER.

Witnesses:

RUPERT E. JACKSON,
VERA S. BUSSEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."