(No Model.)

W. C. ELLIS.

ANTI FREEZING, NON EXPLODING CUT-OFF FOR BATH BOILERS.

No. 332,387. Patented Dec. 15, 1885.

Fig. 1.

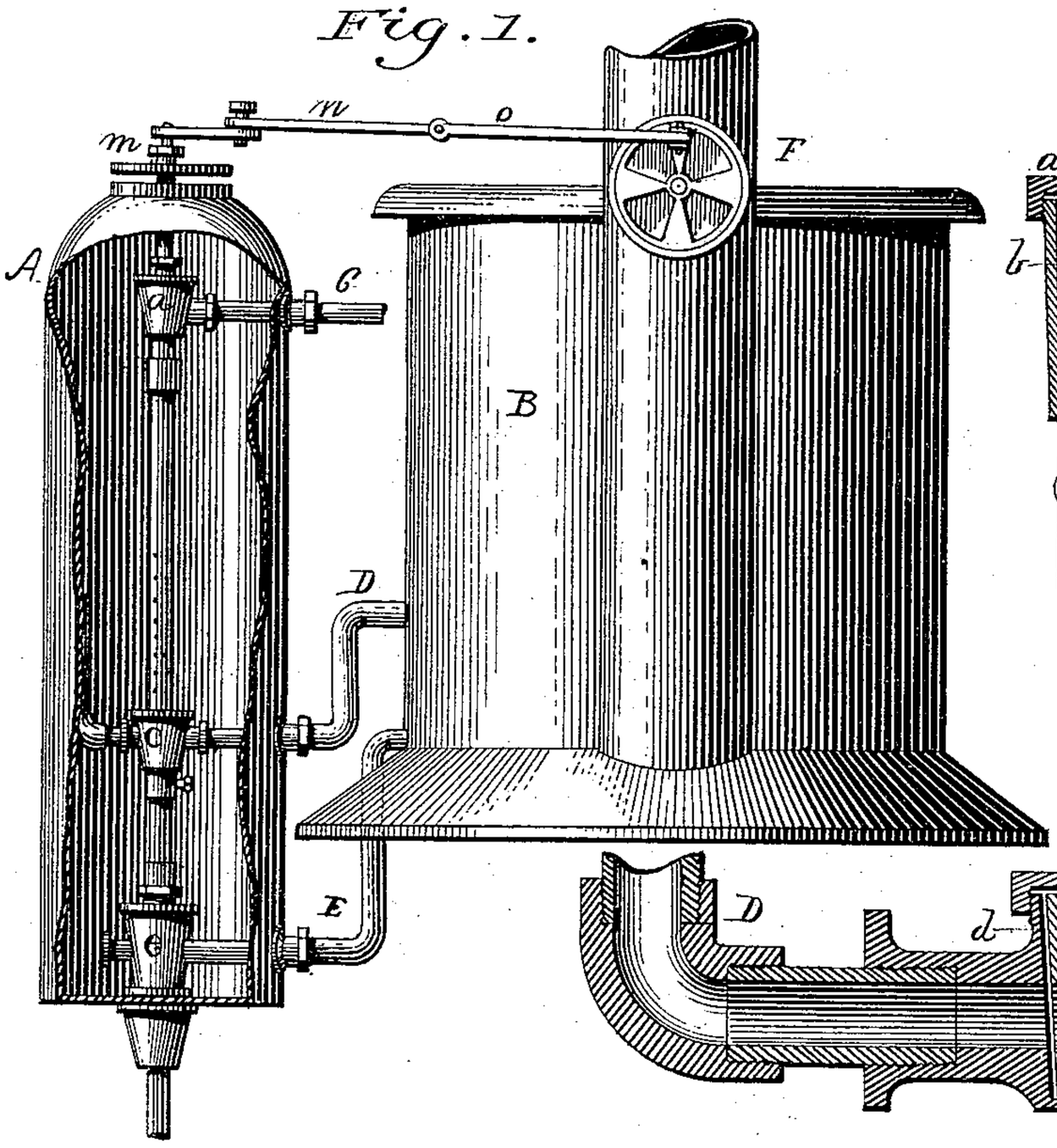
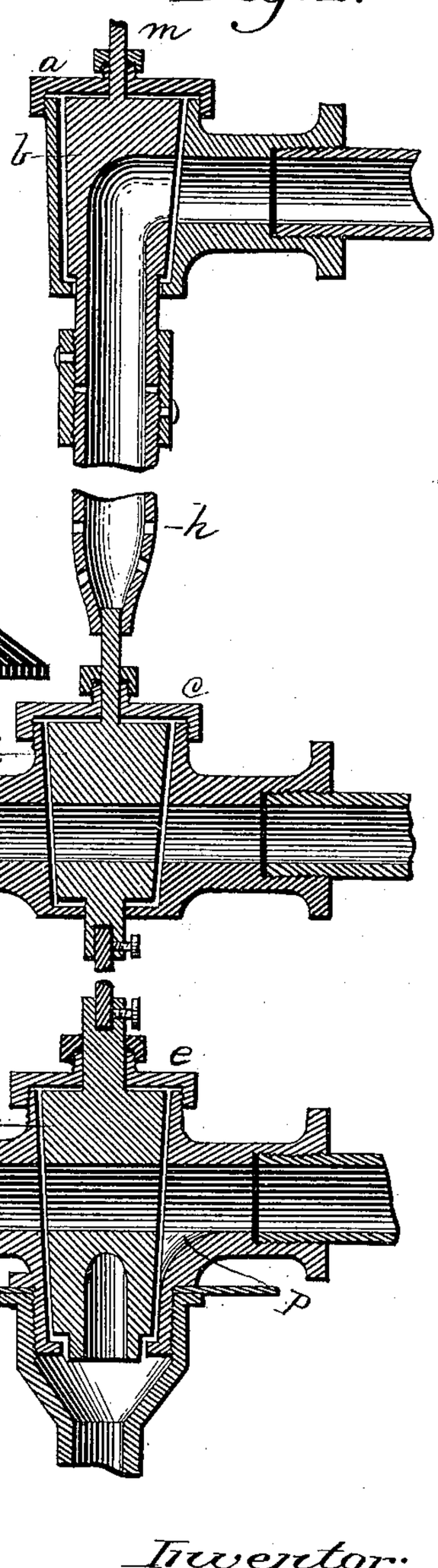


Fig. 2.



Witnesses:
M. L. Cornwell
Wm. Fischer

Inventor:
Wm. C. Ellis.
per L. J. Stanton,
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM C. ELLIS, OF MARSHALLTOWN, IOWA.

ANTI-FREEZING, NON-EXPLODING CUT-OFF FOR BATH-BOILERS.

SPECIFICATION forming part of Letters Patent No. 332,387, dated December 15, 1885.

Application filed February 26, 1885. Serial No. 157,428. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. ELLIS, of Marshalltown, county of Marshall, and State of Iowa, have invented a new and useful Improvement in Bath-Boilers, of which the following is a co nplete specification.

My invention consists in an improved automatic cut-off and heat-regulator combined in such a manner with a boiler that they may be operated together. My cut off devices are so connected with the heater as to prevent explosions from steam, and so constructed and placed that they will not freeze. By my peculiar arrangement of the aforesaid devices the operator is enabled to control the circulation of water through the heater.

The mechanism of my invention is illustrated in the accompanying drawings, in which Figure 1 is a front view of the boiler, part being broken away, and heater, showing their connection. Fig. 2 is a back view of a vertical section of my cut-off devices, illustrating their connection and the course of circulation.

A is a stand-boiler.

B is a water back or reservoir resting on a stove or furnace.

C is a pipe connected with the water-main or other source of supply which empties into the boiler A.

E is a pipe which conveys water from the boiler to the water-back or heater.

D is a pipe which conveys the water from the heater into the boiler.

a is the shell of the first cut-off, and contains a hollow plug, *b*. Integral with *b* is a pipe, *h*, so perforated as to afford free communication between the boiler and the supply-pipe C.

c is the shell of the second cut-off, and contains a plug, *d*, which is joined to *h*.

e is the shell of the third cut-off, and contains a plug, *f*, which is joined to *d*. The opening or closing of the connection between the interior of the boiler and the pipes C, D, and E depends upon the rotation of the plugs *b*, *d*, and *f*. In the shell *e*, in line with the pipe E, is an oblique channel, P, downward to the plug *f*, on the side toward the heater. The lower part of the plug *f* is hollow, and at right angles to the orifice corresponding to the pipe E is a lower orifice corresponding to the channel *p*.

m is a shaft connected with the plug *b*, which projects out of the boiler, and which is integral with a crank. The crank is joined by two rods, *n* and *o*, to a damper, F, in the stove or furnace in such a manner that when the damper allows the heat to increase the plugs allow the water to circulate, and when the damper diminishes or cuts off the heat-supply the circulation of water through the boiler and water-back diminishes or ceases. When the heat and water-supply are cut off, the lower orifice in the plug *f* is opposite the channel *p*, and water flows from the reservoir B through the pipe E and plug *f* from the boiler.

In the operation of my invention the crank *m* is rotated so as to adjust the damper F to increase the heat, and it consequently adjusts the plugs *b*, *d*, and *f*, respectively, to the pipes C, D, and E. Water flows through *b* and *h* into the boiler. Being cold, it sinks to the level of E, and passes through *f* into the reservoir B. Here it is heated and flows back through D and *d* into the boiler, in which it rises to the top, and whence it may be drawn as desired. If now the crank *m* be rotated so as to shut off the heat, the plug *b* shuts off the water-supply, while the reservoir is drained through the plug *f*. The cut-off devices, being in the interior of the boiler, will not freeze, and the peculiar construction of the plug *f* obviates danger from steam.

The entire device is easily operated by the crank *m*, and may be readily attached to any heater.

I claim as my invention—

1. The combination of a stand-boiler with a supply-pipe extending into the boiler and provided with a valve within the boiler, a drain-pipe extending into the boiler and provided with a valve within the boiler, a connection between the two valves rigidly uniting them, and an extension from the stem of one of said valves passing outside the boiler, substantially as and for the purposes shown and described.

2. The combination of a stand-boiler, a supply-pipe extending into the boiler and provided with a valve within the boiler, a drain-pipe extending into the boiler and having a valve within the boiler, with pipes communicating with the water-back, one of which extends into the boiler and is provided with a valve within the boiler, a connection rigidly

uniting all of the valves, and an extension from one of the valve-stems passing outside of the boiler, substantially as described.

3. The combination of a stand-boiler, a supply-pipe extending into the boiler and provided with a valve having a hollow plug connected with the pipe within the boiler, pipes communicating with the water-back, the upper one of which extends into the boiler, and is provided with a valve within the boiler, a pipe connected to the hollow plug of the supply-pipe valve and to the stem of the water-back valve, rigidly uniting the same, said pipe being provided with perforations near to its lower end, and an extension from the other valve-stem passing outside of the boiler, substantially as described.

4. The combination of a stand-boiler, a supply-pipe extending into the boiler and provided with a valve having a hollow-plug connection with the pipe within the boiler, pipes communicating with the water-back, the upper one of which extends into the boiler, and is provided with a valve within the boiler, a pipe connected to the hollow plug of the supply-pipe valve and to the stem of the water-back valve, rigidly uniting the same, said pipe being provided with perforations near the lower end, and an extension from the other valve-stem passing outside the boiler, and the damper of a range connected with a crank attached to the plug of the supply-pipe outside the stand-boiler by two links, substantially as described.

WILLIAM C. ELLIS.

Witnesses:
JOSEPH TAFFREE,
J. C. SWAN.