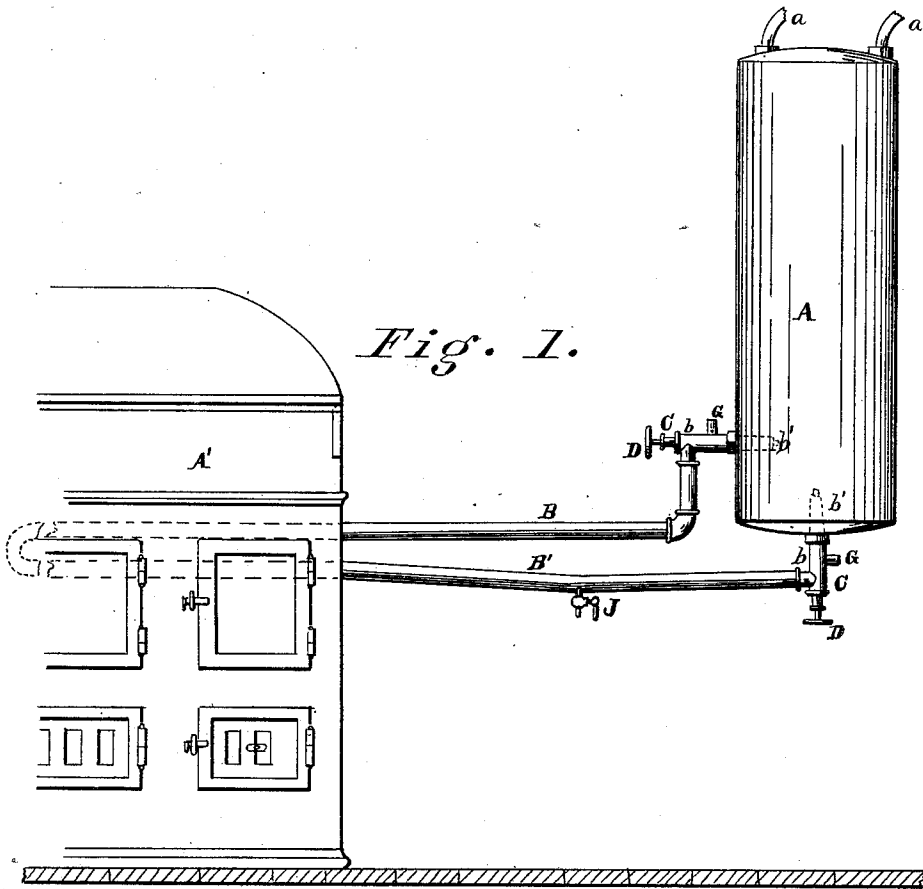
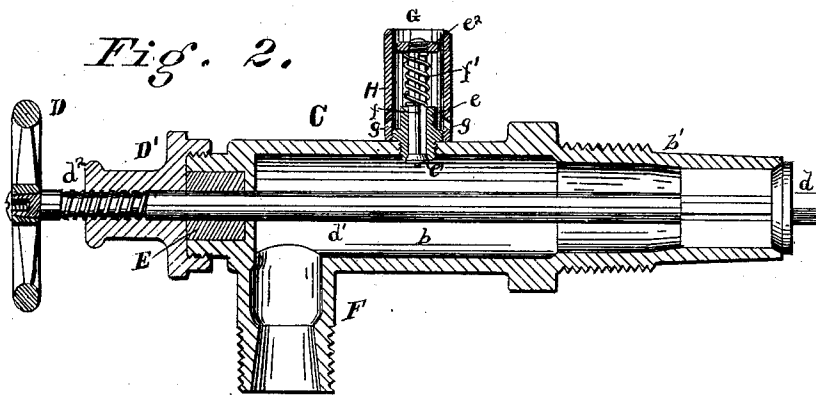


(No Model.)

G. EICHERT.
Apparatus for Upright Boilers.

No. 241,847.

Patented May 24, 1881.



Attest
J. W. Strehli.
C. W. John

Inventor
George Eichert
per *Wm. Hubbell Fisher,*
Atty.

UNITED STATES PATENT OFFICE.

GEORGE EICHERT, OF CINCINNATI, OHIO.

APPARATUS FOR UPRIGHT BOILERS.

SPECIFICATION forming part of Letters Patent No. 241,847, dated May 24, 1881.

Application filed January 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE EICHERT, a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Apparatus for Upright Boilers, of which the following is a specification.

A great many disastrous accidents occur from the explosion of the water-backs and circulation-pipes, and the blowing off of couplings used in apparatus of boilers for heating water for house use. These explosions are mainly caused as follows: Ice is often formed in the pipes connecting the boiler and the heating-pipes in the stove or range, and often in said latter pipes after the fire in the said stove or range is allowed to go out. After a fire is again kindled in the stove steam is generated in the heating-pipes in the stove, and being prevented from passing out into the boiler by the ice before referred to, finally, as the pressure of steam is increased, bursts the pipes, &c., frequently blowing out the top and side of the stove, causing other damage and frequently great loss of life.

The object of my invention is to provide a valve which will permit of a perfect drainage of the pipes, so that no water is allowed to stand or freeze in said pipes, and thereby all danger is obviated.

The nature of my invention will be apparent from the following description:

Referring to the drawings forming part of this specification, Figure 1 represents a portion of a stove or range and the upright boiler, and shows the pipes connecting them, said pipes being provided with the valves forming the principal feature of my invention. Fig. 2 is a central section through one of the valves constructed according to my invention.

A represents the upright boiler, of ordinary construction; and A' the stove or range, to which the boiler is connected by means of pipes B B'. These pipes are coiled or otherwise arranged within the stove or range in any suitable manner, in order that the fire coming in contact with them will heat the water contained within them, and produce a consequent circulation of fluids in said pipes and in the boiler A. The boiler A is provided with the ordinary supply or feed pipe *a* and outlet-pipe *a'*,

through which latter the hot water is conveyed to various parts of the building. Each of the pipes B B' is provided with an angular box or valve-cage, C, the particular construction of which is shown in Fig. 2.

b is the main body of the valve-cage, the inner end, *b'*, of which, when the pipes are properly connected to the boiler A, extends some distance into the interior of the boiler, as shown in dotted lines in Fig. 1. The object of thus extending the end *b'* into the interior of the boiler is to carry the valve well into the boiler, in order that it may be constantly immersed in the hot water therein contained, and thus prevent the freezing of the valve in extreme cold weather. The particular form of valve may be varied to suit the manufacturer; but the preferred form is that herein shown—viz, a button, *d*, fitting into a valve-seat in the end of the portion *b'*, as shown in Fig. 2. This button is connected to a rod, *d'*, which passes through the valve-cage *b*, and to the outer end of which a small wheel, D, is connected. The rod *d'* near the wheel D has a screw-thread, *d''*, which engages a thread in the nut D', which latter is screwed onto the body *b*. A suitable packing, as E, is placed around the rod *d'* at some point, to prevent leakage. When the wheel D is turned the thread *d''* and nut D, through the medium of the rod *d'*, causes the button *d* to fit tightly into the valve-seat or to be moved away from it, which movement governs the flow of the water through the valve. The main body *b* is provided with a branch, F, to which one of the pipes B B' is connected.

To one side of the body *b* is connected a vent, preferably automatic, and preferably of the form hereinafter described. As shown, this vent consists of a short tube, *e*, which is screwed into the body *b*, the inner end of which tube is controlled by a valve, *e'*. This valve *e'* is connected to a rod, *f*, which passes through the tube *e*, and is provided at its outer end with a button, *e''*. A spiral spring, *f'*, surrounds the rod *f*, and is compressed between the button *e''* and the outer end of the tube *e*, thus tending to keep the valve *e'* against the inner end of the tube *e*.

The vent G is preferably surrounded by a guard-tube, H, to protect it, and this guard-tube is provided with numerous small holes, *g*,

for the more ready admission of air to the vent. The way in which my invention operates to permit a drainage of the pipes is as follows:

When it is desired to let the fire in the stove go out, the water must be removed from the pipes B B'. To accomplish this the valve *d* must be closed to shut off communication with the interior of the boiler. After these valves *d* have been closed the exhaust-cock J, which is placed at the lowest point of the pipe B', is opened. It is now that the advantages of my invention are made most manifest. Were it not for the latter the pipes could not be thoroughly emptied, for the reason that they would be closed at one end, and after a certain amount of water had been withdrawn a vacuum would be formed, and thus a portion of the water would be retained in the pipes. My invention admits of the complete withdrawal of the water by permitting air to enter the pipes, for as soon as sufficient water has escaped through the cock J to cause a vacuum to be formed the suction will draw the valve *e'* (which is held against the tube *e* by the spring *f*) away from the end of the tube *e*, and air will enter the pipes B B', and a perfect vacuum cannot therefore be formed, and the water will thus all be permitted to escape from the pipes, and thus the objects at which my invention aims will be accomplished. As a precautionary measure, the valve *d* and cock J should be opened before the fire is started in the stove, to be sure that the pipes are open, which will be made manifest by water escaping from the cock J.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination of the pipes B B', connecting the boiler and stove, and the exhaust-cock J, and the valve-boxes, each provided with a cut-off valve and a vent, substantially as and for the purposes specified.

2. The combination of the pipes B B', connecting the boiler and stove, and the exhaust-cock J, and the valve-boxes, each provided with a cut-off valve and an automatic vent, substantially as and for the purposes specified.

3. The combination of the pipes B B', connecting the boiler A and stove A', and the exhaust-cock J, and the valve boxes or cages C, the latter being provided with the automatic vents G, substantially as and for the purposes specified.

4. The combination of the boiler A and the valve-cage C, the latter being provided with automatic vent G, and with the portion *b'* extending within the boiler, and the pipe B, substantially as and for the purposes specified.

5. The combination of the valve cage C, provided with automatic vent G, and the nut D', rod *d'*, and valve *d*, substantially as and for the purposes specified.

6. The combination of the vent G and guard H, the latter being provided with holes *g*, substantially as and for the purposes specified.

GEORGE EICHERT.

Witnesses:

A. S. LUDLOW,
E. R. HILL.