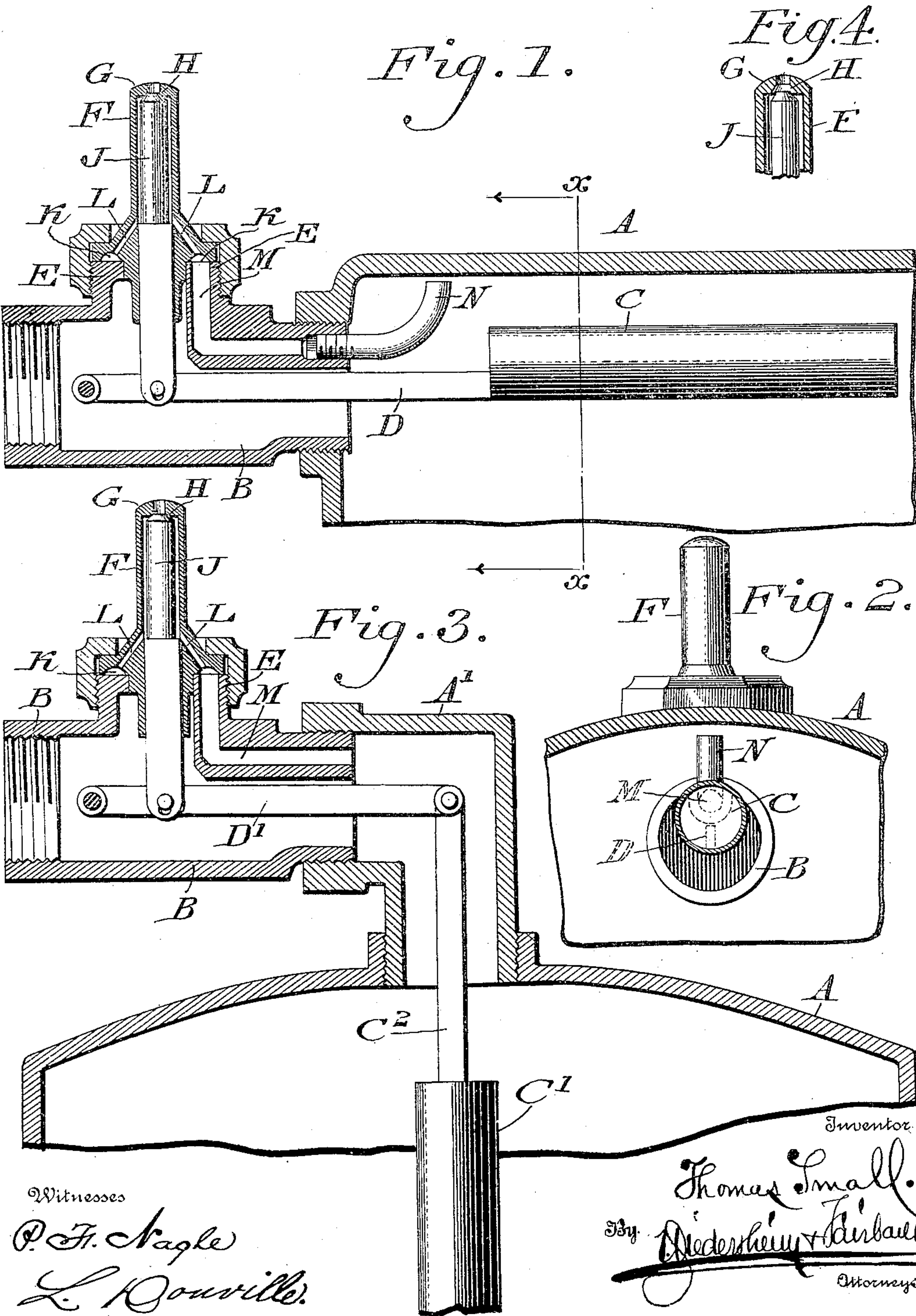


No. 824,214.

PATENTED JUNE 26, 1906.

T. SMALL.
SAFETY ATTACHMENT FOR BOILERS.
APPLICATION FILED FEB. 15, 1905.



Witnesses
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SAFETY ATTACHMENT FOR BOILERS.

No. 824,214.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed February 15, 1905. Serial No. 245,695.

To all whom it may concern:

Be it known that I, THOMAS SMALL, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Safety Attachment for Boilers, of which the following is a specification.

My invention consists of a regulator and a safety attachment for a boiler by which provision is made for preventing the water when low from being forced back by the steam into the main or source of supply and from heating the cold-water spigot, which is connected with the supply-pipe of the boiler.

Attention is directed to the fact that the boiler is of the class intended more particularly for kitchen and bath-room purposes, and in the present invention provision is made for utilizing the branch pipe that directs the hot water to such place of service as the means of connection of the members employed for effecting the result.

Figure 1 represents a longitudinal section of a portion of a boiler having a regulator and safety attachment embodying my invention. Fig. 2 represents a transverse section thereof on line *x x*, Fig. 1. Fig. 3 represents a section of a portion of another form of boiler and a modification of the regulator and attachment. Fig. 4 represents a detached view of the valve employed in open condition.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a portion of a horizontally-arranged boiler, and B designates a nipple or tubular branch connected therewith.

C designates a float within the boiler A, the same being connected with the lever D, which partly enters the nipple B and is mounted thereon. Rising from said nipple is the tubular neck E, above which is the casing F of the valve G, whose seat H is on said casing. It will be noticed that the branch B has an outlet independent of the valve-casing F for the purpose of directing the hot water from the boiler A to a place of service—such as a kitchen, bath-room, &c.—and the top of said casing has an opening forming an outlet which is uncovered when the valve G leaves said seat H, so that steam from the boiler may escape from said casing, as will be hereinafter described. The stem J of said valve passes through the casing F and has its lower end pivotally connected with the lever D. In the base of the casing F is the channel K,

from which extend the ports L, the latter leading from the bore M in the neck E to the interior of said casing F, it being noticed that the stem J is somewhat of less diameter than that of the casing F, so that steam may pass through the latter to the valve thereof. Connected with the lower end of the bore M is the pipe N, which enters the boiler A and is curved or deflected upwardly and extends nearly to the upper wall of the boiler A, or at least above the level that the water may assume in said boiler, it being noticed that the steam-space in the boiler is in communication with the pipe N, and consequently with the bore M and the valve-casing. It will be seen that under normal conditions the valve G is held close on its seat by the action of the float C when the latter occupies its highest position, the valve G being closed, whereby escape of the steam is prevented.

As the water is removed from or becomes low in the boiler the float C sinks, whereby the pressure of steam exerted on the water is now sufficient to return the water to the main or source of supply and heat the usual cold-water-discharge spigot connected with the supply-pipe of the boiler; but these are immediately prevented, for as the lever D and stem J lower with said float the valve G is opened, (see Fig. 4,) whereby an outlet for steam is provided, the steam then entering the pipe N, the bore M, and the ports L, and so is directed into the casing F, from whence it escapes through the open valve through the outlet at the top of the casing, as hereinbefore referred to. Again, should the heat of the boiler be high and convert the main body of the water into steam, whereby the volume of the latter would be otherwise dangerous and possibly cause explosion, the float again sinks, and so opens the valve, whereby the steam escapes and the boiler is relieved. As the boiler is re-supplied with water the float C rises, and so closes the valve G, whereby the steam is prevented from escaping, while the ordinary operation of the boiler may continue.

In Fig. 3 I show the attachment as applied to a vertically-arranged or upright boiler, in which case the float C' depends from the lever D' and the latter is connected with the stem J, the operation, however, being in general respects the same as that in the embodiment shown in Fig. 1. In this construction the nipple B is connected with the boiler by the elbow or piece A', in which the adjacent end portion of the lever D' and upper end por-

tion of the supporting-arm C² of the float C' have their play, said piece forming the communication between the boiler and nipple B.

5 Various changes may be made in the details of construction shown without departing from the general spirit of my invention, and I do not, therefore, desire to be limited in each case to the same.

10 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 1. A hot-water boiler, a hot-water-conveying branch connected therewith and adapted to have attached to it, a pipe leading to a place of service, a valve, a casing for said valve, separate means in said branch forming a communication between the boiler and said valve-casing, and means in the boiler connected with said valve automatically operating to open the latter when the valve falls, 20 said valve-casing and branch being independent of each other.

25 2. A hot-water boiler, a hot-water-conveying branch connected therewith and adapted to have attached to it, a pipe leading to a place of service, a valve, a casing for said valve, separate means in said branch forming

a communication between the boiler and said valve-casing, a float in said boiler, and a lever carrying said float and entering said 30 branch and being connected with said valve, said valve-casing and branch being independent of each other.

3. In a boiler, an outlet therefor, a bore in said outlet independent of the same, a pipe 35 connected with said bore and having its inlet end in said boiler, a valve, a communication between said bore and the casing of said valve, and means in the boiler connected with said valve adapted to automatically open 40 the latter when the water lowers.

4. In a boiler, an outlet, a tubular neck thereon, a bore in said outlet in communication with said neck, a valve, a port intermediate of said neck and the casing of said valve, 45 an upwardly-deflected pipe in the boiler connected with said bore, and means in the boiler connected with said valve automatically operating to open the latter when the water falls.

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Witnesses:

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