(No Model.)

A. H. FOWLER.

SAFETY WATER GAGE.

No. 364,756. Patented June 14, 1887.

Fig. 1.

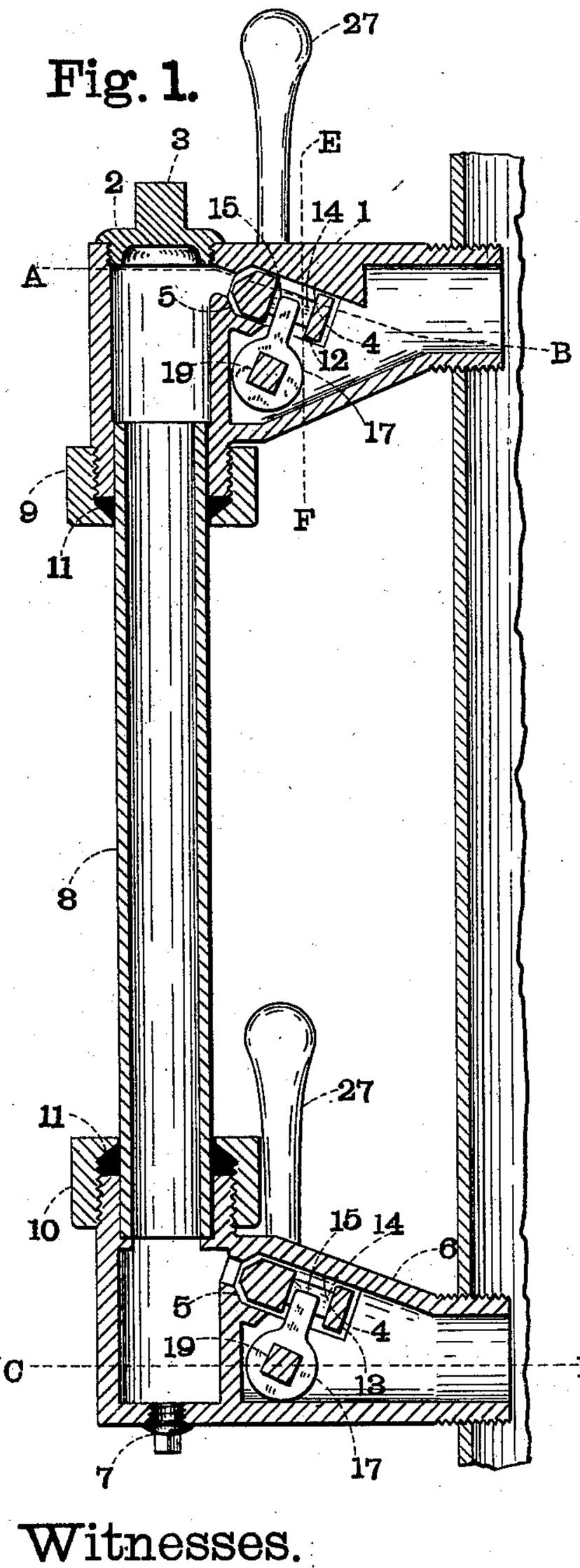


Fig. 2.

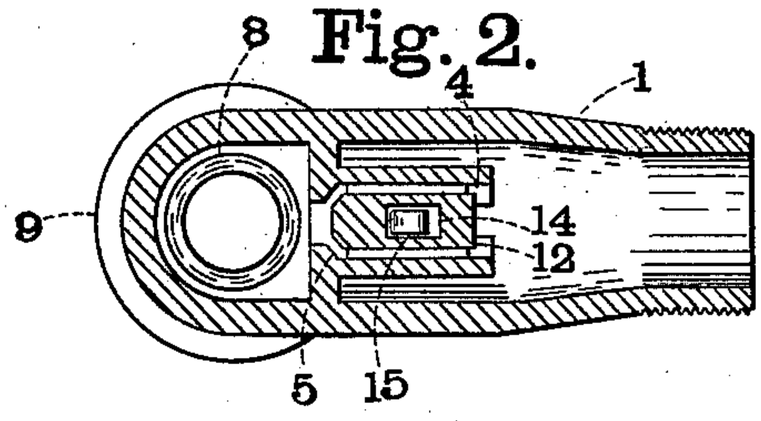


Fig. 3.

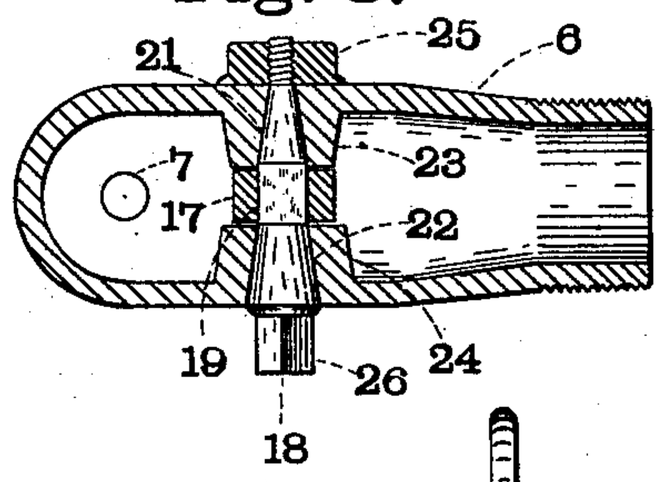
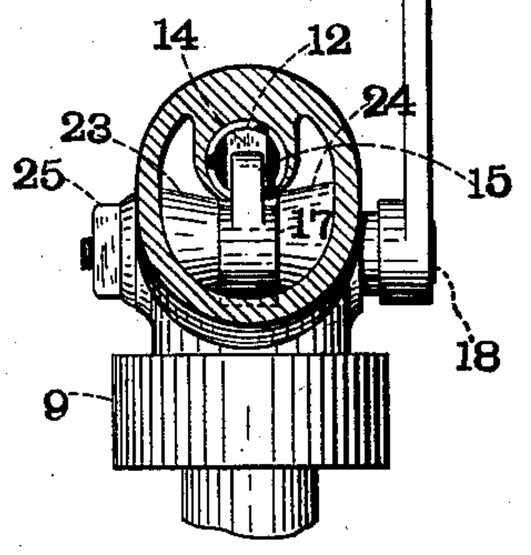


Fig. 4.



Witnesses.

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SAFETY WATER-GAGE.

SPECIFICATION forming part of Letters Patent No. 364,756, dated June 14, 1887.

Application filed September 16, 1886. Serial No. 213,713. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. FOWLER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Self-Closing Valves for Steam-Boilers, of which the following is a specification.

My invention relates to certain improvements in self-closing valves for steam-boilers. Its object is to prevent the escape of steam or water if the glass tube of a water-gage or other device for confining the steam or water in front of the valves should break; and it consists of an automatically-acting stop-action valve, or valves which are instantly closed by the force of the escaping steam or water should the pressure in front of the valves be suddenly released, all of which will be fully and clearly hereinafter described, shown, and claimed, reference being had to the accompanying drawings, in which I have shown the invention in connection with a glass water-gage as a suitable device for illustrating one of the uses to which the invention may be adapted.

Figure 1 is a vertical central section through the valve, valve-cases, and glass tube, showing also a portion of a boiler to which it is attached. Fig. 2 is a section on line A B, Fig. 1. Fig. 3 is a section on line C D, Fig. 1; and Fig. 4 is a section through line E F, Fig. 1.

The upper valve-case, 1, is provided with a screw-cap, 2, having a nut-section, 3, adapting it to be secured in place by a wrench in the usual way. Its object is to provide the means for inserting the tube 8 when required.

The upper part of the case 1 is also provided with a valve-chamber, 4, having a valve-seat, 5. 6 represents the lower valve-case. It is also provided with a valve-chamber 4 and a valve-seat 5. At the bottom of the case 6 is a small screw-cap or plug, 7, adapted to be easily removed by means of an ordinary wrench.

8 represents the glass tube. It is secured to the upper and lower cases, 1 and 6, by the stuffing-boxes 9 and 10, which screw onto the cases 1 and 6, as shown.

11 represents the usual packing for securing a steam-tight joint around the glass tube.

The valves 12 and 13 are located in inclined valve-chambers 4, so as to give them a tendency to keep open, or away from the valve-seats 5, while the device is in operation.

Through each valve is an opening, 14, into which the end 15 of the arm 17 passes. This arm 17 is mounted upon a shaft, 18, having the square portion 19 adapted to fit closely in the square opening in the arm 17, and thereby hold it rigidly in its position thereon. This shaft 18 is provided with a round tapering portion, 21, (see Fig. 3,) the largest part of which is small enough to pass through the square opening in the arm 17.

22 represents another tapering portion similar to the portion 21. It tapers in the same direction, and is made of larger diameter. These tapering portions are adapted to fit in the bearings 23 24, (shown in Figs. 3 and 4,) and are ground so as to be steam-tight. At one end of the shaft or pin 18 is a nut, 25, for securing and holding it in place. At the opposite end is a nut-section, 26, adapted to receive the handle 27 when it is necessary to open or close the valve by hand. The hole through the valves is made long enough to permit a certain amount of lost motion, so as to allow them to be shut automatically by the action of the steam without moving the arm 17 should the glass tube 8 burst or break and permit the steam or water to escape.

It will be seen from this construction that the valves may be operated either by hand or automatically by the steam and water, and that in the event of the glass tube 8 breaking and suddenly releasing the steam and water therein the full force of the steam and water will instantly be brought against the back of the valves and cause them to move up the inclined valve-chambers and close at once, thereby shutting off the steam and water, so that the cap 2 may be taken off and a new glass tube, 8, or other equivalent device inserted and secured in place, as before mentioned, after which the valves may be opened and placed in the position shown in Fig. 1 by turning the handles into the vertical position shown in said Fig. 1.

The object in placing the valves in inclined chambers is to cause them to keep away by gravity from the valve-seats, or to resist any slight pressure of steam or water, and conse-

quently to keep them open at all times, unless closed by the sudden removal of the pressure in front of the valves or the breakage of the glass tube, as above mentioned, whereby the full force of the steam and water is brought against them.

The object of the handle 27 is to provide the means for closing the valves when the device is in use, or to remove the valves from their seats when the breakage above referred to is repaired, so as to leave them in position to work, and to allow the steam or water to close them automatically should another release of pressure in front of the valve occur.

I do not limit myself to the use of this device in connection with a glass water-gage; but I have shown it in this connection for the purpose of illustrating one of its uses, as it is adapted for use for other purposes in connection with the use of steam or water.

It will be noticed that the inclined valve-chambers 4 are provided with an opening at the bottom, so as to permit the end 15 of the arm 17 to pass up through it into the recess or opening in the valves.

I claim as my invention—

1. A self-closing valve set in a guideway inclining from the valve-seat downward and provided with an opening, 14, in combination with a shaft set in bearings within the valve-case and having a handle, 27, for operating it, and an arm, 17, the end of which projects through the bottom of the valve-chamber 4 into the opening 14, and is made smaller than the opening, whereby the valve may be closed automatically by the force of the steam or water, or opened or closed by hand, substantially as and for the purposes described.

2. A gage for steam-boilers, consisting of two valves, 12 and 13, set in inclined guideways within the valve-case and adapted to be open while in their normal condition and to be automatically closed by the force of the steam or water when the pressure is suddenly withdrawn from the front of the valves, substantially as specified.

3. The combination of the tube 8, the cases 1 and 6, to which the tube is secured, the inclined guideways and valves 12 and 13, and a steam-tight-fitting shaft provided with an arm for opening or closing the valves by hand, as and for the purposes described.

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