No. 798,180. PATENTED AUG. 29, 1905.

O. L. HALLBECK.

MEANS FOR EXCLUDING WATER FROM STEAM SUPPLY PIPES.

APPLICATION FILED FEB. 20, 1905.

Fig. 1.

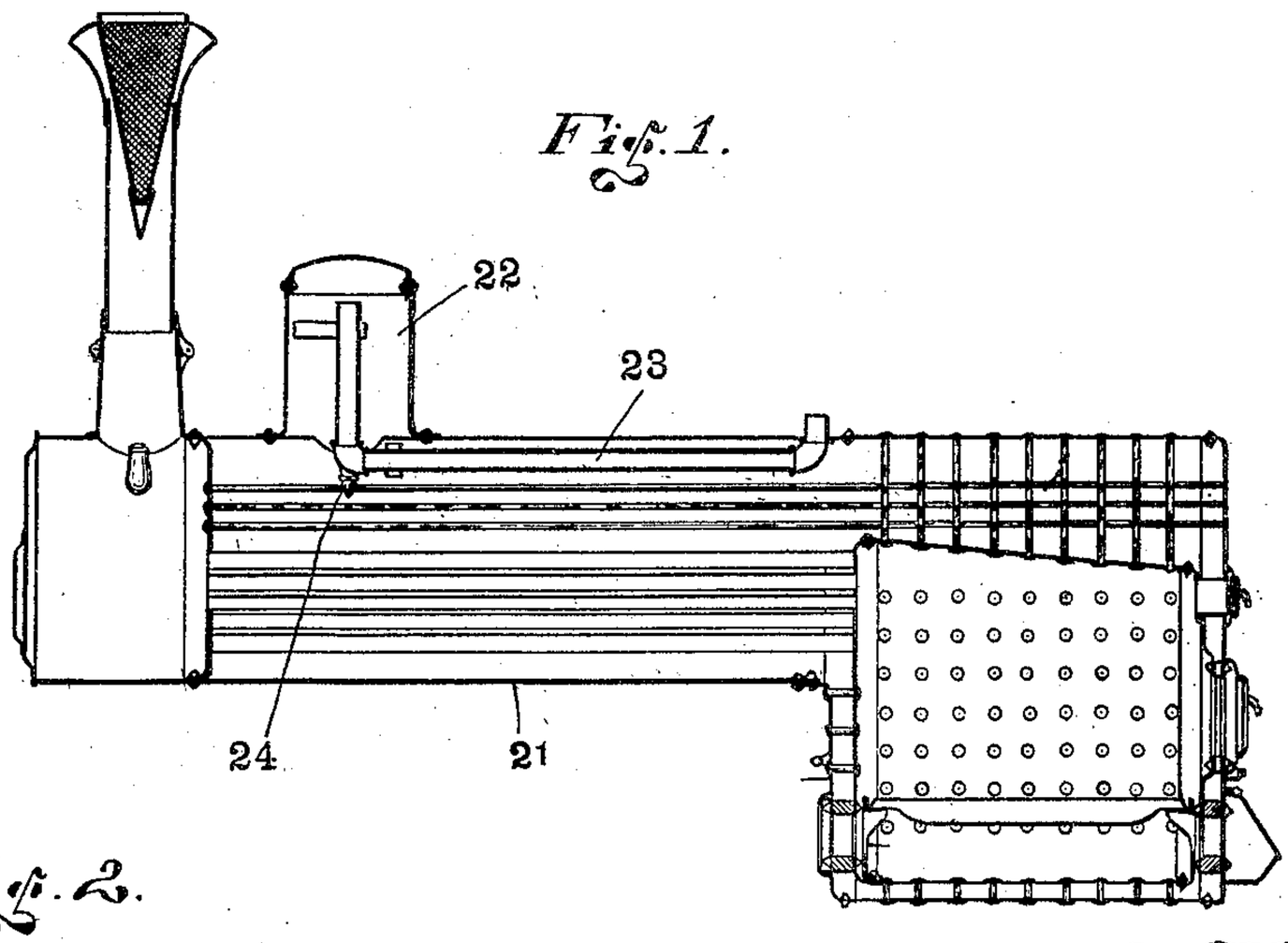


Fig. 2.

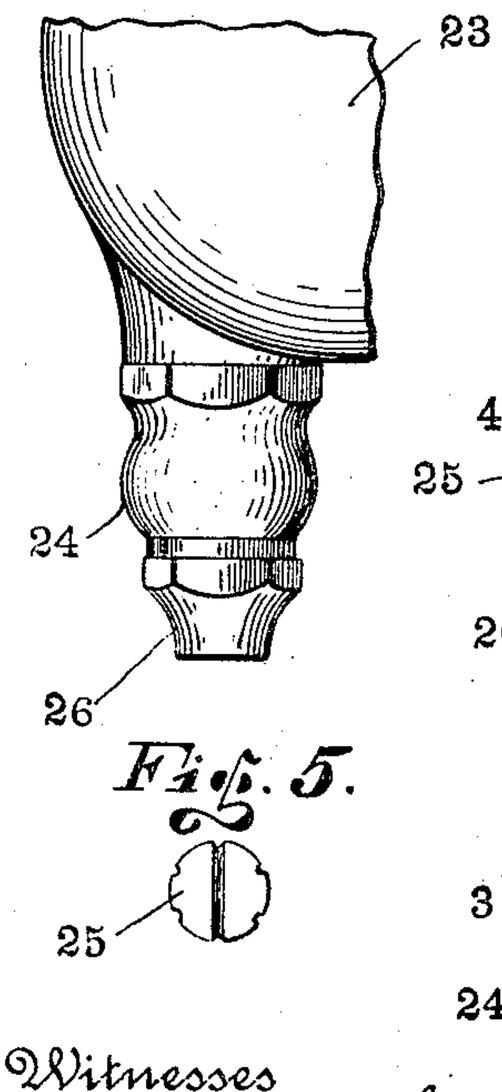


Fig. 3.

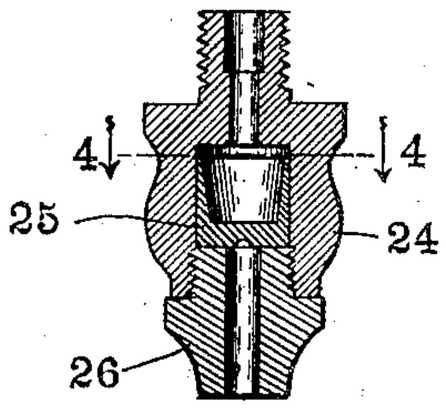


Fig. 4.

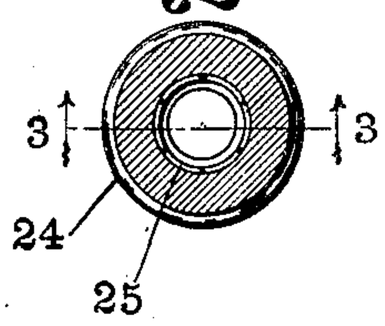


Fig. 5.

Fig. 6.

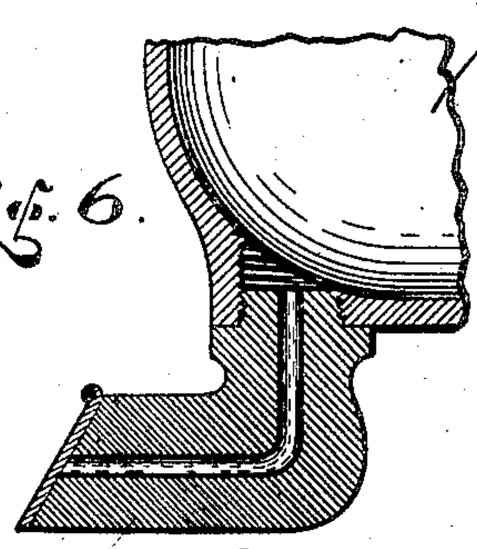
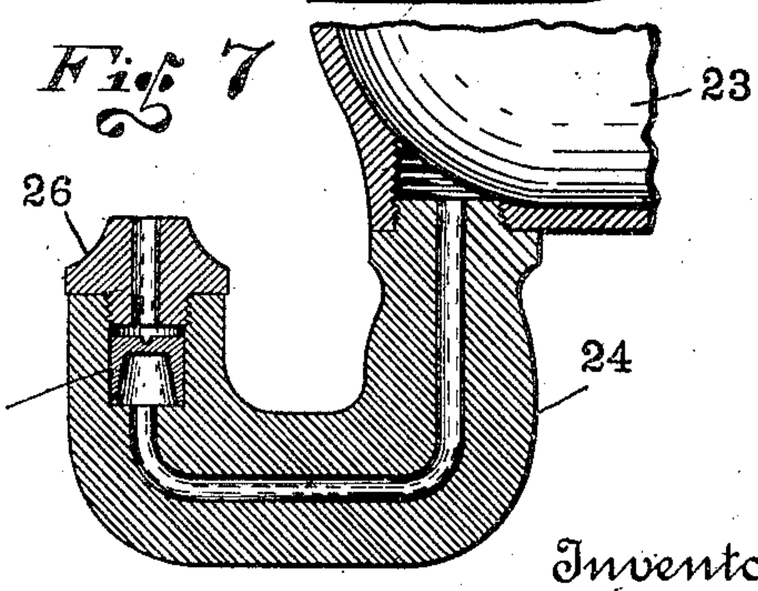


Fig. 7



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OTTO L. HALLBECK, OF WEST SALEM, ILLINOIS.

MEANS FOR EXCLUDING WATER FROM STEAM-SUPPLY PIPES.

No. 798,180. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed February 20, 1905. Serial No. 246,521.

To all whom it may concern:

Be it known that I, OTTO L. HALLBECK, a citizen of the United States, residing at West Salem, in the county of Edwards and State of Illinois, have invented certain new and useful Improvements in Means for Excluding Water from Steam-Supply Pipes when Arranged within the Boiler, of which the following is a specification.

In some varieties of steam-boilers, especially those of portable engines, it is desirable that the main steam-supply pipe, which leads from the dome of the boiler to the engine, should, as far as possible, be contained within the upper portion of the boiler itself for reasons which are well understood by those skilled in the art. In agricultural engines particularly the pipe at that end where it approaches the engine leads upwardly, and as the other end also leads upwardly to near the top of the steam-dome this produces a "trap" which must have means of drainage in order to prevent the accumulation of water therein and the consequent freezing and bursting of the pipe when the machine is out of use in cold weather. In such an arrangement so long as the engine is not working the pressure, both externally and internally, on the pipe in question will remain equal, and when the engine is in operation, especially when it is working to full capacity and particularly when somewhat overloaded, the steam passes into the engine with considerable rapidity and the pressure inside the pipe thus becomes reduced, so that if there is a vent for the escape of water for the purposes stated it will act as an opening through which water will be drawn into the pipe in the case stated, mingling with the steam with the well-understood objectionable results.

It is the object of my invention to provide a means by which this pipe will be kept drained of water at all times, but which means shall not permit the ingress or sucking in of water when the engine is laboring.

Said invention therefore consists in the combination with a boiler and a steam delivery-pipe arranged therein in the manner stated, of an automatically-acting valve through which any water accumulating in the pipe may escape, but which, when the pressure within the pipe is decreased, as when the engine is at work, will automatically close and prevent any ingress of water into said pipe.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a diagrammatic sectional view of a steam-boiler of the class stated and having its steam-delivery pipe extending down from within the upper portion of the dome to within the boiler, thence rearwardly to about the point where the steam-engine is ordinarily attached, and thence upwardly to a point where it commonly can connect with such a steam-engine, said pipe being provided at a suitable point with an automatically-acting valve for the purpose stated; Fig. 2, a side elevation of the valve and immediately adjacent parts on an enlarged scale; Fig. 3, a sectional view of said valve, showing a suitable construction for the purpose; Fig. 4, a horizontal sectional view at the point indicated by the dotted line 4 4 in Fig. 3; Fig. 5, an underside plan view of the valve proper, showing a construction which I have found suitable for the purpose; and Figs. 6 and 7, detail views illustrating alternative forms of valve for the purpose.

The steam-boiler 21, its dome 22, and the steam-pipe 23 are or may be, each and all, of an ordinary and well-known form and construction and are or may be arranged in a common well-known manner. The steam-pipe, as will be observed, is almost wholly within the boiler and dome and is protected from exposure to the air, which, as is well known, is very desirable in this class of boilers. At some suitable point in the lower portion of this pipe or one of the elbows thereof I provide an automatically-acting valve 24. In Figs. 1, 2, 3, 4, and 5 I have illustrated a desirable form of such a valve. This, as best shown in Fig. 3, comprises a body having a chamber therein, the bottom of which forms the valve-seat and having a central perforation adapted to drain the pipe to which the valve is attached. Within this body or shell is the valve proper, 25, which I have shown as cup-shaped in form in order to make it light, the edge of the cup being adapted to contact with the valve-seat when the valve is closed. Within the outer wall of this valve 25 are suitable grooves running longitudinally thereof to the bottom, and there is also a groove across the bottom end of said valve, as best shown in Figs. 3 and 5, said grooves being for the purpose of permitting passage-ways for the water to run off when the valve is open. A plug 26 is arranged to be screwed in behind the valve and hold it in place. The movement of the valve 25 is very slight, as indicated in Fig. 3. When at

rest, as will be readily understood, the valve 25 rests on the bottom of its chamber in the position shown in Fig. 3, and when in this position the valve is open and the water will run very freely through it with at least sufficient rapidity to keep the pipe drained under the circumstances. When, however, on account of the use of the steam the pressure inside the pipe becomes less than the pressure outside, it will cause the valve 25 to rise against its seat, which effectually shuts the valve and cuts off the passage of anything through it and prevents the water from being sucked into the pipe and mixed with the steam. In Fig. 6 I have shown a flap-valve which operates in the same way, so far as this invention is concerned, except that the water itself when it accumulates inside the pipe tends to force the valve outwardly somewhat and open it.

In Fig. 7 I have shown the same form of valve as is shown in Figs. 1 to 5, inclusive, except that it is inverted. When a valve is so positioned or constructed, it will remain closed at all times, except when the water within the pipe accumulates sufficiently to press against the valve and open it, when it will flow out past said valve in substantially the same manner as in the arrangement previously described. I may say in this connection that other forms of valves may be employed, the only requisite being that the valve shall be of an automatically-operating character—*i. e.*, such as to permit it to be moved by pressure or suction from one position to another, so as to operate in the manner described.

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

1. The combination, of a steam-boiler, a steam-pipe arranged within said boiler and leading from the steam-dome down into the body of the boiler, along within said body, and thence out, a passage-way from the lowest part of said pipe to within the boiler whereby said pipe may be drained, and an automatically-operating valve to said passage-way, substantially as and for the purpose set forth.

2. The combination, of a steam-boiler, a trapped steam-pipe leading from the steam-space and having its lowest portion within the boiler, a passage from the lower portion of said pipe, and a check-valve to said passage arranged to permit said pipe to be drained but preventing ingress of water from the boiler therethrough into said pipe.

3. The combination, of a steam-boiler, a steam-pipe arranged within said boiler and leading from within the steam-dome down into the body of the boiler, along within said body, and thence out, a passage from the lowest part of said pipe extending entirely below said lowest part and opening into the boiler, and an automatically-operating valve whereby egress through said passage-way is permitted but ingress therethrough is prevented.

In witness whereof I have hereunto set my hand and seal, at West Salem, Illinois, this 17th day of February, A. D. 1905.

OTTO L. HALLBECK. [L. S.]

Witnesses:
W. H. FLUCK,
F. S. WILEY.