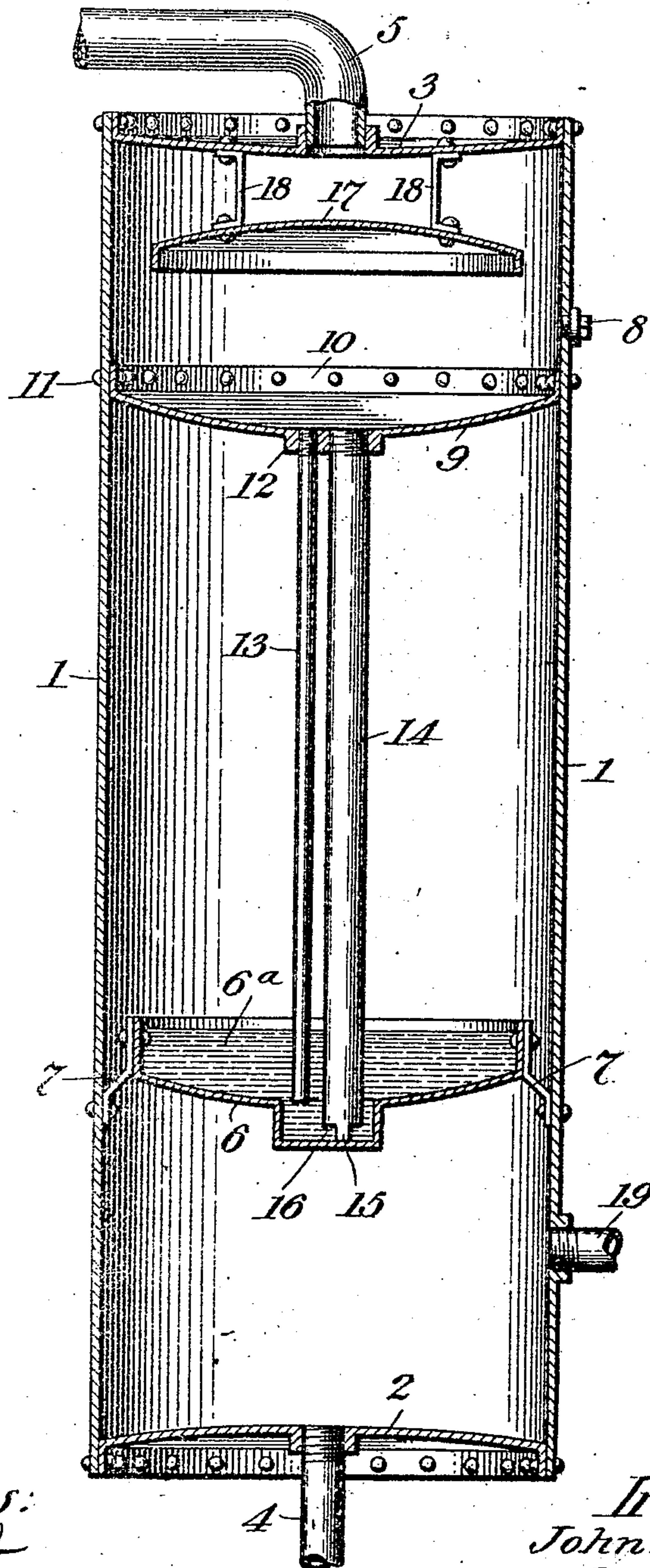


No. 876,746.

PATENTED JAN. 14, 1908.

J. H. THIELE.  
SAFETY VALVE.

APPLICATION FILED APR. 24, 1907.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOHN H. THIELE, OF NEW YORK, N. Y.

## SAFETY-VALVE.

No. 876,746.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed April 24, 1907. Serial No. 370,008.

*To all whom it may concern:*

Be it known that I, JOHN H. THIELE, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Safety-Valve, of which the following is a full, clear, and exact description.

My invention relates to safety valves, my more particular object being to produce a type of safety valve suitable for general use but of peculiar value in connection with steam and hot water heating plants.

Reference is to be had to the accompanying drawing forming a part of this specification, in which the figure represents a vertical section through one form of my improved safety valve, showing the positions of the mercury tray and the two vent pipes, the returning funnel and the baffle.

A cylindrical shell 1 is provided with heads 2, 3, the heads being fitted with pipes 4, 5, the pipe 5 representing the exhaust through which the steam or excessive hot water may be thrown off.

At 6 is a tray mounted upon brackets 7 and filled with mercury 6<sup>a</sup>. A fuse plug is shown at 8. A funnel 9 is provided with an annular flange 10 secured within the shell 1 by aid of rivets 11, or equivalent fastenings. This funnel is provided with a neck 12 which is fitted with pipes 13, 14 depending therefrom. The pipe 14 is larger than the pipe 13 and is provided with a projection 15 and with slots 16 upon each side of the same. The purpose of thus shaping the lower end of the pipe 14 is to insure that it will always be open. The effective open end of the pipe 14 projects below the open end of the pipe 13.

A baffle plate 17 is mounted upon brackets 18 and depends from the head 3, the center of this baffle plate being over the pipes 13, 14. A pipe 19 taps into the side of the shell 1 and may be designated as the steam pipe or hot water pipe, as distinguished from the pipe 4 which is the return pipe.

The operation of my device is as follows: The pipes 4, 19 being connected up directly with the heating system (steam or hot water, as the case may be) the shell 1 thereupon wholly or partially fills with steam. The water contained in it may rise above the mercury tray 6, but this fact is immaterial for the reason that the mercury can neither flow nor dissolve. The pressure upon the upper surface of the mercury 6<sup>a</sup> causes the

latter to rise in the pipes 13, 14, and ultimately to enter the return funnel 9. As soon, however, as the pressure reaches a predetermined limit, the lower end of the tube 13 is exposed and the excessive steam thereupon lifts the column of mercury contained within the pipe 13 and makes its escape. In doing this the mercury is projected upwardly from the pipe 13 and strikes the baffle plate 17, running thence into the funnel 9, and the steam bubbling up and escaping through the mercury thus contained in the funnel. This operation will ordinarily give all the relief necessary to save the system from damage due to excessive pressure of either steam or hot water. Suppose, however, that owing to a sudden ebullition somewhere in the system it should happen that there is an excessive pressure at once forced upon the system so that the capacity of the pipe 13 is not great enough to afford adequate relief. In this case the level of the mercury 6<sup>a</sup> descends still further so that steam or hot water is admitted through the mutilations 16 into the pipe 14, and the mercury contained within this pipe is thrown upward against the baffle plate 17. The steam or hot water, as the case may be, may now escape freely through both pipes 13, 14.

The use of mercury insures positive action; that is to say, the safety valve, though capable of opening to various degrees, as above explained, is nevertheless always either open or shut, and there can be no undesirable leakage or incidental escape of steam or water through the apparatus, except such as is called for by the general condition of the pressure.

The device may be cheaply constructed and requires no especial skill in its manipulation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a cylindrical shell, brackets disposed within said cylindrical shell, a tray connected with said brackets and supported thereby, said tray being provided with a deep central portion, a volume of liquid contained within said tray, a funnel mounted within said cylindrical shell and connected thereto, so as to form a partition, thus dividing said shell into different compartments, a pipe fitted into said funnel and extending therefrom below the level of said liquid, and means for admitting a fluid under



pressure into the compartment containing said tray.

2. The combination of a shell, a funnel disposed within said shell and connected gas-tight thereto so as to form separate compartments within said shell, a tray separate from said shell, brackets mounted upon said shell for supporting said tray, means for admitting pressure of an aeriform body into the compartment of said shell containing said tray, a heavy liquid located within said tray,

and a pipe connected with said funnel and extending below the level of said liquid in said tray.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. THIELE.

Witnesses:

JOHN J. LYNCH,  
LOUIS THIELE.