

No. 836,347.

PATENTED NOV. 20, 1906.

O. TITTELBACH.
SAFETY VALVE.

APPLICATION FILED AUG. 1, 1905.

Fig. 1.

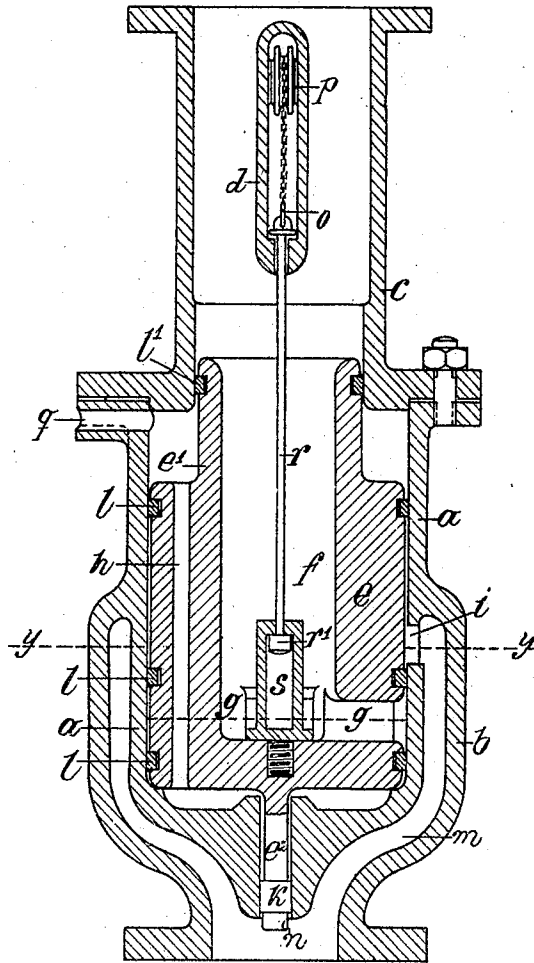
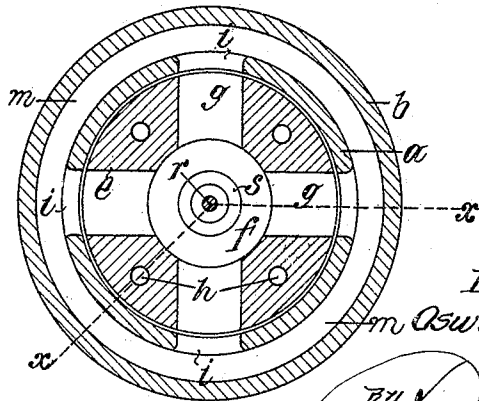


Fig. 2.



Witnesses

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OSWIN TITTELBACH, OF RUHRORT, GERMANY.

SAFETY-VALVE.

No. 836,347.

Specification of Letters Patent.

Patented Nov. 20, 1906.

Application filed August 1, 1905. Serial No. 272,274.

To all whom it may concern:

Be it known that I, OSWIN TITTELBACH, a subject of the German Emperor, and a resident of Ruhrort-on-the-Rhine, Germany, have invented certain new and useful Improvements in Safety-Valves for Vessels with High Internal Pressure, of which the following is a specification.

The subject of this invention is a safety-valve chiefly intended for vessels with a high internal pressure, which offers to the gases, vapors, or fluids under pressure only a small surface to act upon when the pressure goes beyond a certain height, but an outlet-opening of any desired size. This is attained by separating the pressure-surface and the outlet-opening for the excess entirely from each other, and thus making them quite independent of each other with regard to their size.

In the drawings the valve is illustrated in Figure 1 in a longitudinal section on the line xx in a state of rest, and in Fig. 2 in a cross-section on the line yy is shown how it works.

Similar letters refer to similar parts throughout both views.

The valve is in the shape of a cylindrical vessel a , open at the top and closed at the lower end by a cone-shaped bottom plate. The lower half is surrounded by a mantle b , which narrows down below the bottom of the vessel and finally terminates in a socket n . Between the mantle and the vessel an interspace m is left. Four openings i , preferably of a rectangular shape and at the same distance from each other, establish the connection between the interior of the vessel with the interspace m . The upper opening of this vessel a is covered by a lid, from which rises a tube c , whose inside diameter is smaller than that of the vessel, with which it runs concentrically. In the upper half of this tube c is a hollow cross-piece d , while the inside diameter of this tube is a little smaller below this cross-piece than that of the upper half.

Inside of the vessel a is a piston e , the upper part e' of which projects into the tube c , for which purpose it has been narrowed down. At its lower end the piston e carries a pin e^2 concentric to it, which pin is journaled in a bore of the cone-shaped bottom of the vessel, out of the lower opening of which it projects quite close to the opening of the socket n . This piston is provided with a central bore f , which, however, does not extend through the whole length of it, and into which open at the bottom four cross-channels

g , similar in shape and size to the openings i of the vessel a . It further has in its central part four longitudinal bores h , uniformly distributed around its central axis, which connect an interspace remaining, when it is in its lowest position, between it and the bottom of the vessel with the space below the lid of the vessel. From this latter space four small lateral bores q lead into the open air.

Close above and below the cross-channels g , as well as close to its central part e and the projection e at the top, the piston is surrounded by stretching rings or slides $l l'$, arranged in annular grooves of the piston, which tightly press against it and at the same time against the inner wall of the vessel a and of the tube c and prevents the escape of vapors or gases from the space m to the outlet-openings q and the tube c and also, when the piston is in its lowest position, into the central bore f . Also the lower end of the pin e is provided with a packing k , intended to form a steam-tight closure of the bottom bore.

By a rod r (whose head r' is journaled in a guiding-sleeve s , rising from the bottom plate of the piston, while its upper end passes through the bottom of the hollow cross-piece d and receives here a chain in the eye o , which chain passes over the roller p) the piston e can be raised as required. The size of the piston e , and accordingly its weight, which, in consequence of its being covered by a mantle, cannot be changed is such that the gases or vapors entering into the annular space m at a tension which remains below the maximum, the pin e^2 , which stands under the immediate action of these mediums, cannot be pushed upward. The piston, therefore, remains in this case in its lowest position, and its cross-channels g are not in communication with those of its guiding-casing. This communication is only established when the maximum tension is surpassed, whereby the pin e^2 , and with it the piston itself, is pushed forward, and this communication is kept up until at the subsiding of the excessive tension the piston sinks back into its lowest position. The gases or vapors entering into the central bore of the piston are led off through the tube c . During the movements of the piston an equalization or compensation of pressure through the longitudinal bores h of its central part e takes place in the spaces above and below the piston.

What I claim as my invention, and desire

to secure by United States Letters Patent,
is—

5 A safety-valve for steam-boilers comprising a vessel open at the top and having a bottom plate closing its lower end, said plate
10 having a hole therein, a mantle *b* surrounding the lower portion of said vessel so as to form an annular chamber between itself and the vessel, a hollow piston fitting in said vessel,
said piston having ports therein, and said
vessel having ports in its side walls leading to

the annular chamber and a pin connected to the bottom of the piston and projecting through the hole in the bottom plate of the vessel so as to be acted on by the steam. 15

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

OSWIN TITTELBACH.

Witnesses:

ERNEST BUDRÉ,
PETER LIEBER.