2 Sheets—Sheet 1.

O. ZWIETUSCH & E. HEITMANN.

Automatic Pressure-Relief Apparatus for Beer-Vessels.

No. 222,975. **Patented Dec. 23, 1879.**

Fig. 1.

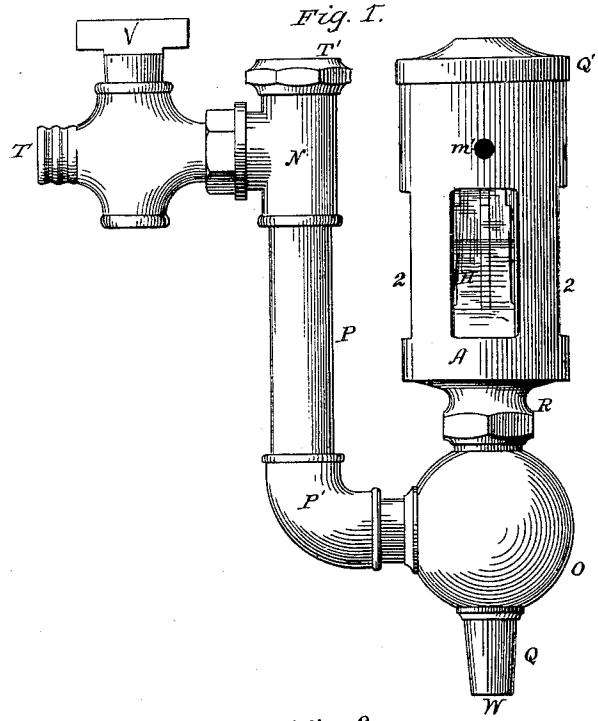
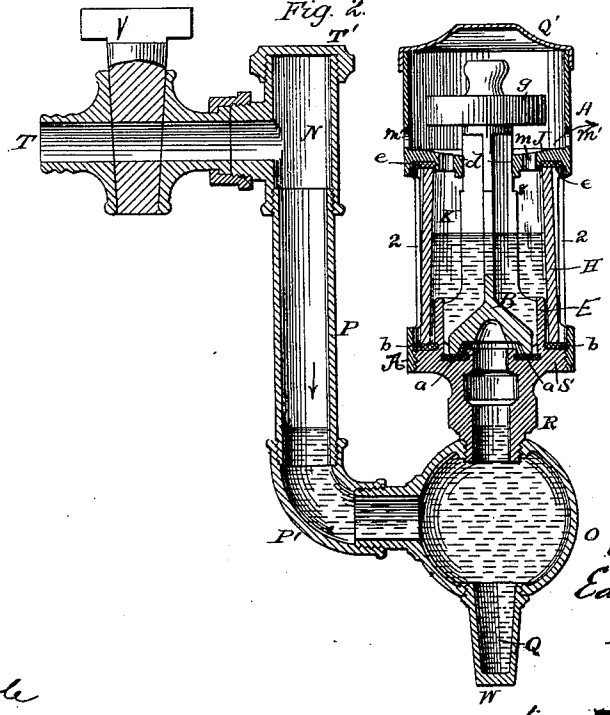


Fig. 2.



Otto Zwietusch
Edward Heitmann
Inventors.

Attest:
Clarence Poole
W. F. Morsell

per atty
A. H. Evans & Co.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

O. ZWIETUSCH & E. HEITMANN.

Automatic Pressure-Relief Apparatus for Beer-Vessels.

No. 222,975. **Patented Dec. 23, 1879.**

Fig. 3.

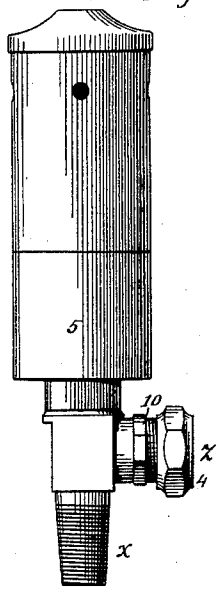


Fig. 4.

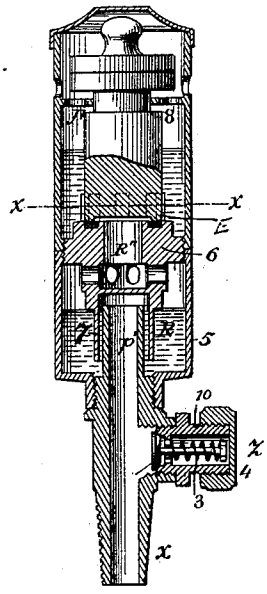


Fig. 5.

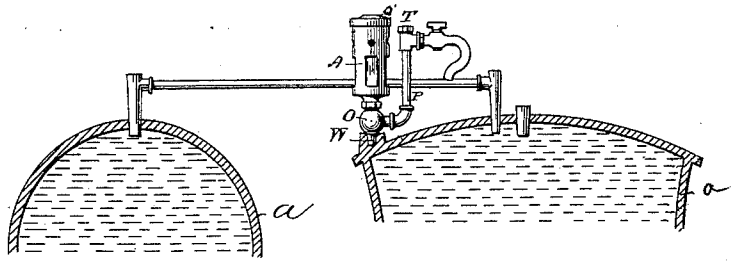
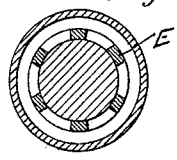


Fig. 6.



Attest:

Clarence Poole.

W. F. Morsell

Inventor:

Otto Zwietusch

Edw. Heitmann

per attys.

A. H. Evans & Co.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OTTO ZWIETUSCH AND EDUARD HEITMANN, OF MILWAUKEE, WISCONSIN; SAID HEITMANN ASSIGNOR TO SAID ZWIETUSCH.

IMPROVEMENT IN AUTOMATIC PRESSURE-RELIEF APPARATUS FOR BEER-VESSELS.

Specification forming part of Letters Patent No. **222,975**, dated December 23, 1879; application filed December 7, 1878.

To all whom it may concern:

Be it known that we, OTTO ZWIETUSCH and EDUARD HEITMANN, of Milwaukee, in the State of Wisconsin, have invented certain Improvements in Automatic Pressure-Relief Apparatus for Beer-Vessels; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of our improved apparatus. Fig. 2 is a vertical section of the same. Fig. 3 shows a modification of our device. Fig. 4 is a vertical section of said modification. Fig. 5 is a sectional view of beer-vessel, showing the application of the apparatus. Fig. 6 is a transverse section of the valve-chamber.

The object of our invention is to provide an automatic pressure-relief valve, adapted to be used on fermenting-casks containing beer and like material, which will not foul, and whereby the automatic action of the valve is made more certain; and our invention consists, first, in a pressure-relief apparatus provided with a mechanical-fit valve surrounded by a body of water; and, secondly, in a pressure-relief apparatus having a body of water interposed between the pressure-generator and a mechanical-fit valve in the line of the escaping gas, and through which it passes.

It also consists in sundry details of construction, as hereinafter more specifically described and claimed.

In order that those skilled in the art may make and use our invention, we will proceed to describe the manner in which we have carried it out.

In the said drawings, T is a tap to enter the cask, or pipes leading to the cask, and in this tap is a T pipe-joint, N, having inserted in its lower end a depending pipe, P, and its upper end covered by a screw-cap, T′. The pipe P has an elbow, P′, and enters a bulb, O, provided at its bottom with a cup, Q. Screwed into the upper end of the bulb is a short pipe, R, having a broad threaded flange, S, which serves as a support or base for the mechanism of the relief-valve proper. A broad groove in flange S, immediately surrounding the upper end of pipe R, contains a rubber packing, *a*, which forms the seat of a valve, B, having its stem made in a cross shape and having a knife-edge bearing. Surrounding the base of the valve is a cylindrical guide slotted so as to make a series of posts, as seen in Fig. 6, and outside of this guide lies a rubber or other annulus, *b*, as a packing for the lower end of a glass cylinder, H. Over the glass cylinder fits a metal cylinder, A, which screws onto flange S, as shown. The upper part of this metal cylinder is provided with a diaphragm, J, having a central opening, *d*, through which passes the valve-stem, and provided with gas-outlets *m* and an annular packing, *e*, to abut against the upper end of the glass cylinder H and pack it tightly. At *m′* is an opening through the cylinder A for the escape of gas to the open air. On the upper end of the valve-stem is placed any desirable weight, *g*, to set the valve at any given pressure, and the upper end of the cylinder A is covered by a removable cap, Q′. Slots 2 2 are cut in the outer metal cylinder, A, so that the operation in cylinder H may be observed at will.

In the overflow from beer-barrels under fermentation is a thick adhesive material called "hop-tar," which seriously interferes with the operations of any ordinary valve mechanism to which it has access.

Our device is particularly adapted to obviate this difficulty, for we surround the valves with a liquid medium, preferably water, whereby the hop-tar is diluted, so as not to stick the valves.

In applying our device a step on the cask (seen in Fig. 5) or other convenient place is provided, in which to place the foot W, seen at the bottom of the implement. The cap T′ is removed and the pipe P and bulb O filled with water to such a height as to bring no pressure against the bottom of the valve, and the chamber K, formed by the glass cylinder H, is filled with water, so as to surround the valve and its seat. The tap T is then connected to the cask, and the valve is ready to perform its duty. The gas, passing from the cask into pipe P and through the water in it and in the bulb O, has washed out of it the greater amount of hop-tar and other impurities carried over, and they settle in depression Q. The water surrounding the valve in cylinder K keeps the

valve always sensitive and free from the ill effects of any impurities carried through the water in bulb O and pipe P.

When it is desired to draw off beer from the cask by use of the air-pump, the cap T′ is removed and the air-pipe attached to the T-joint N at that point.

Figs. 3 and 4 show a modification of our device adapted to be used on one cask and applied directly to it. As shown therein, X is a tap that enters the cask proper, and in its side is a check-valve, Z, kept closed by a coiled spring, 3, the opening over the valve being closed by a cap, 4. A prolongation of the tap-pipe p' enters some distance into a chamber, R, formed by a metallic cylinder, 5. This cylinder has a diaphragm, 6, corresponding in construction to flange S in Fig. 2, and from this diaphragm depends a pipe, 7, which passes over pipe p' and approaches the bottom of the chamber, a space remaining between pipes 7 and p', which, when the chamber is filled with water, form a sort of trap to force the escaping gas down below the surface of the water, and thence it escapes through opening R″, the same as in Fig. 2. In each instance the valve-stem is provided with a shoulder, 8, to limit the extent of its motion by striking the diaphragm J′. In this modification, when the beer is drawn by means of an air-pump, the cap 4 is removed and the air-pipe is attached to the check-valve housing 10.

We make no claim, broadly, in this application, to holding beer during the process of brewing under an automatically-controlled pressure for any purpose, for such is not our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an automatic pressure-relief apparatus, a mechanical-fit valve, in combination with a surrounding chamber, K, for containing water to prevent the valve fouling, for the purpose set forth.

2. In a pressure-relief apparatus, the water-chamber O, in combination with a mechanical-fit valve, B, and connecting-pipe P, said chamber being interposed between the valve and the pressure-generator, as and for the purpose described.

3. The combination of valve B, water-chamber K, glass cylinder H, and shell A, provided with openings 2, as specified.

4. In a pressure-relief apparatus, the water-chamber O, in combination with the downwardly-extending cup, Q, as described.

5. A pressure-relief apparatus, in combination with the inlet-pipe P, cap T′, and cock V, as set forth.

6. In a pressure-relief valve, the base S, diaphragm J, and shell A, provided with openings m m', as described.

7. In a pressure-relief valve, the slotted guide E, in combination with the valve B and casing H, for the purpose set forth.

OTTO ZWIETUSCH.
EDUARD HEITMANN.

Witnesses:
WILLIAM VETTE,
JOHANN MARIA GOTTSCHALK.