(No Model.)

J. SARGENT & M. WARREN.

SAFETY VALVE.

No. 305,966. Patented Sept. 30, 1884.

Fig. 1.

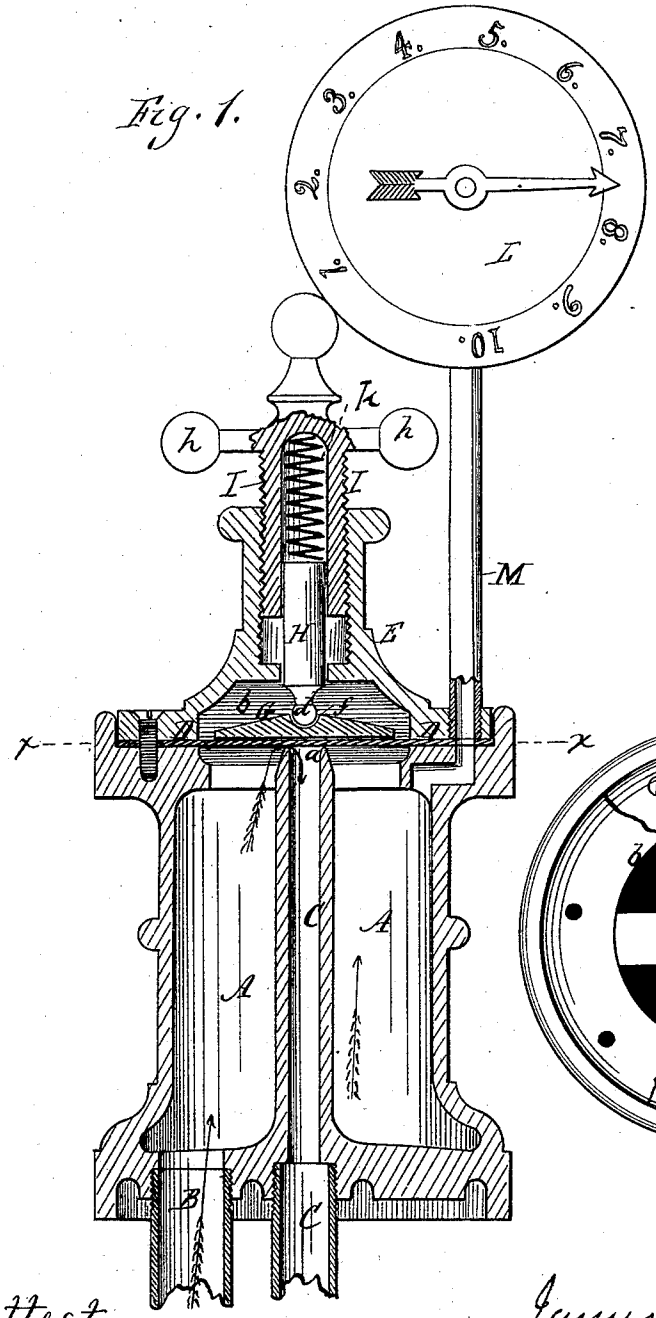
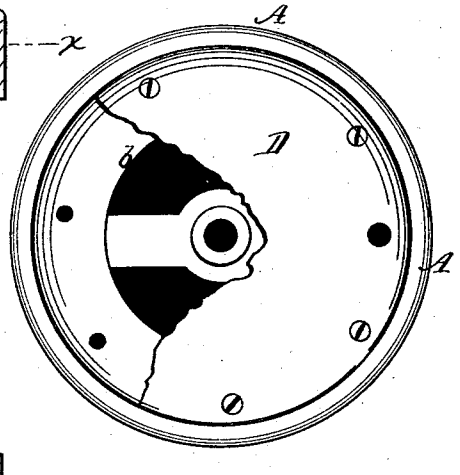


Fig. 2.



Attest.

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UNITED STATES PATENT OFFICE.

JAMES SARGENT AND MARION WARREN, OF ROCHESTER, NEW YORK.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 305,966, dated September 30, 1884.

Application filed April 16, 1884. (No model.)

To all whom it may concern:

Be it known that we, JAMES SARGENT and MARION WARREN, both of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Safety-Valves; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of the valve. Fig. 2 is a plan of the lower portion of the same, looking down from line *x x* of Fig. 1, a portion of the flexible diaphragm being broken away to show the valve-seat.

Our improvement relates to spring or weighted valves to regulate the pressure of liquids or fluids under confinement, and allow an automatic discharge of same, and it is adapted to many and various uses, but especially to beer casks or tanks, where it is necessary to preserve uniform pressure, but to vary the same at different times and under different circumstances. In such apparatus it is customary to use a valve covering but a small escape-opening, and it is frequently the case that there is not sufficient surface for the pressure to raise the valve, and if this surface is increased, the escape-opening is made too large. To obviate the difficulty, it has been customary to use an escape-passage at one side of and independent of the valve-opening, through which the pressure can act upon a mechanism connected with the weight lever or beam to raise the valve.

The object of our invention is to furnish a large yielding surface for the pressure to act upon to open the valve, and yet present but a small seat for the valve to rest on, all as hereinafter described.

In the drawings, A shows a cylinder which receives the pressure by means of an induction-pipe, B, or any other means.

C is a hollow pipe within the cylinder, that forms the discharge, said pipe having at its upper end a valve-seat, *a*, of comparatively small size. The pressure entering the cylinder passes up through the same, and then turns into the discharge-pipe, when the same is uncovered and escapes.

D is a flexible diaphragm, made of rubber or other suitable material, resting across the top of the cylinder and upon the top of the valve-seat *a*, which it packs, and secured at the edges by any desired means. The central part of the diaphragm rests in an opening, *b*, of considerable extent, by which means the pressure underneath acts upon a comparatively large surface of the diaphragm, and with sufficient power to raise it from the valve-seat at all times under the pressure at which the valve is set.

E is a cap or dome, which is fitted on top of the cylinder and secured thereto by any suitable means, and clamping the edges of the diaphragm in place.

G is a follower resting in the chamber *b* and on top of the central portion of the diaphragm, and serving to press the latter down upon the valve-seat.

H is a plug or spindle, resting loosely in the cap, and provided at its lower end with a round knuckle, *d*, that rests in a corresponding socket, *f*, of the follower, forming a universal joint. If desired, the connection may be such that the plug and follower can be removed together as one piece.

I is a hollow cylinder, threaded on its outside and screwing down into the top of the cap E, being adjustable higher or lower by that means, and provided at its top with handles *h h*, by which it is turned. The interior of this cylinder forms a bore for receiving the upper end of the plug H, and contains a spring, *k*, which presses upon the plug. It will be seen that when the nut I is turned down the elastic pressure upon the diaphragm above the valve-seat will be increased, and when turned up it will be diminished, and by this means any desired resistance to the pressure below the valve can be given, and it can be graded exactly to the necessities of the case.

L is an ordinary pressure-gage, connected by a pipe, M, with the interior of the cylinder A, below the diaphragm, by which the interior pressure is indicated.

The advantages of this invention are that a sufficient surface of the diaphragm is presented to the pressure to insure the proper raising of the valve at all times, and at the same time the valve-seat is made so small that the dia-

phragm will close it readily, so that small impulses of the pressure are sufficient to make a discharge, and the valve closes so quickly that only the necessary amount is let off to preserve the equilibrium. The valve is thus much more sensitive in action, and will preserve a greater uniformity in the pressure, which is important, especially in treating beer and fermented liquors. In common valves now in use the valve-seat is either made large to fit a large valve, or else the valve is made small to fit a small seat, in which case there is not sufficient pressure under the valve to raise it, and extra devices must be used to assist the raising of the valve. In either case the action of the valve is not regular, and the pressure is not uniformly maintained.

Instead of a spring-valve such as above described, a weighted valve may be used, if desired; and the discharge-pipe C, instead of extending down vertically through the cylinder, may be carried out laterally or in any other direction, if preferred.

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

1. In a valve for regulating pressure in a vessel or chamber, the combination of a discharge-pipe having a valve-seat at its inner end, a diaphragm acting as a valve to close the end of the discharge-pipe, and receiving the pressure from the interior vessel or chamber against its surface around the discharge-pipe, and means, as the follower G, plug H, and spring *k*, for producing the requisite pressure to keep the valve closed, for the purpose herein specified.

2. The combination of a hollow cylinder, A, communicating with the interior of a vessel or chamber under pressure, a discharge-pipe, C, reaching into the cylinder, and a diaphragm-valve, D, closing one end of the cylinder, and adapted to be pressed inward to close the inner end of the discharge-pipe, whereby an enlarged surface for raising the diaphragm-valve by the interior pressure and a valve-seat of small size are secured, for the purpose herein specified.

3. The combination of the cylinder A, communicating with the interior of a vessel or chamber under pressure, a discharge-pipe, C, reaching into the cylinder, a diaphragm-valve, D, closing one end of the cylinder A and the inner end of the discharge-pipe C, means, as the follower G, plug H, and spring *k*, for producing the requisite pressure on the valve, and adjusting-nut I, for regulating the degree of pressure on the valve, substantially as and for the purpose herein specified.

4. The combination of the cylinder A, the diaphragm D, the discharge-pipe C, the follower G, the plug or spindle H, the nut I, and spring *k*, as shown and described, and for the purpose specified.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JAMES SARGENT.
MARION WARREN.

Witnesses:
R. F. OSGOOD,
P. A. COSTICH.