(No Model.)

2 Sheets—Sheet 1.

J. G. PRITCHARD.

CHURN VENTILATOR.

No. 332,677. Patented Dec. 15, 1885.

Fig. 1.

WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

J. G. PRITCHARD.

CHURN VENTILATOR.

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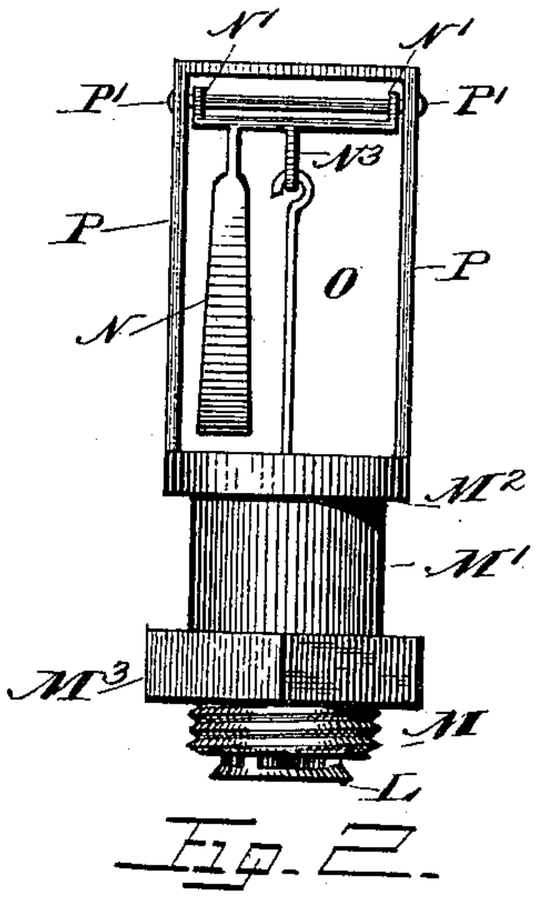

Fig. 2.

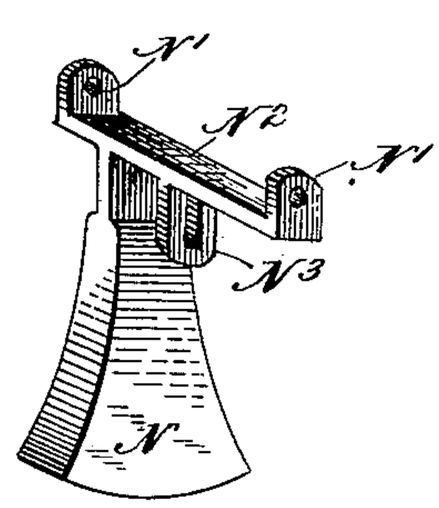

Fig. 3.

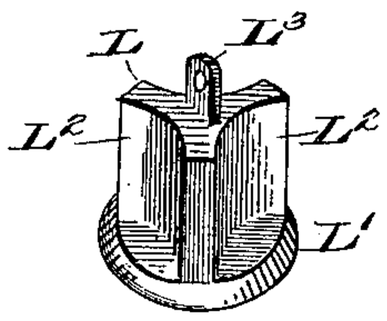

Fig. 4.

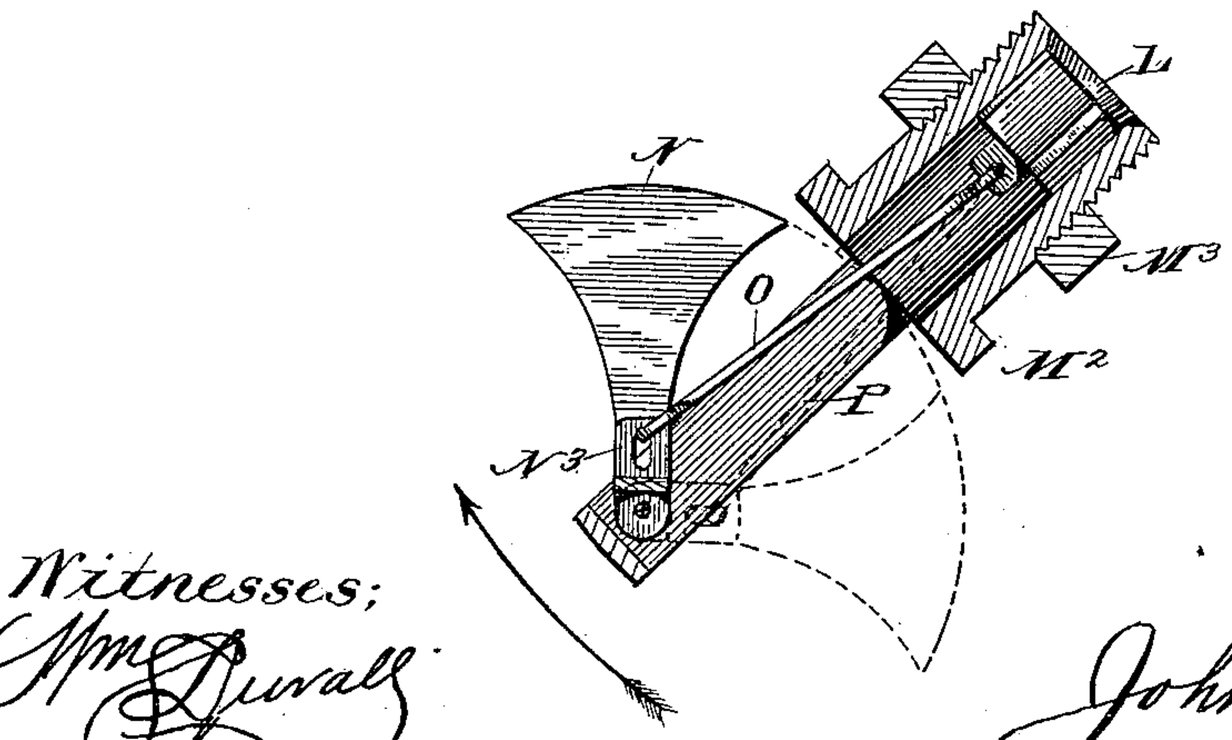

Fig 5

Witnesses;
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T. L. Fracker.

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by E. B. Stocking
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UNITED STATES PATENT OFFICE.

JOHN G. PRITCHARD, OF POULTNEY, VERMONT.

CHURN-VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 332,677, dated December 15, 1885.

Application filed December 31, 1884. Serial No. 151,641. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. PRITCHARD, a citizen of the United States, residing at Poultney, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Churn-Ventilators, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an automatically-operating ventilating device for churns of that class which in operation revolve, and which of necessity are provided with air-tight-fitting covers, so fitted that they will not fail of being fluid-tight, so that in operation no fluid can escape.

The invention is not limited in respect to its application for use to churns, but is equally adapted for use in connection with mixing-machines, washing-machines, pulp-boilers, and other similar devices which in operation revolve and are required to have air-tight-fitting covers.

I have in this instance illustrated the application of my automatic ventilator to a churn, known to the trade and by dairymen as a "barrel-churn," one that is in operation revolved endwise.

In operating churns of the class above referred to it has been found necessary during the early part of the process of churning to frequently remove the cork or plug from the tube usually placed in the body of the churn near the bottom, for the purpose of letting out the gas that is generated by the agitation of the cream. Again, it is necessary when drawing off the buttermilk or water used for rinsing the butter to either remove or loosen the cover in order to admit air, and thereby provide sufficient atmospheric pressure to cause a steady flow of the fluid through the discharge orifice or tube.

The object of this invention is to provide a venting device which shall operate automatically, and thus obviate the necessity of frequent removals of the churn-cover or other venting devices arranged upon the churn.

Referring to the drawings, Figure 1 is a front elevation of a complete barrel-churn, one which in operation revolves endwise, provided with my improved vent, and with a cover constructed in accordance with my invention, as secured to me in United States Patent No. 298,889, granted May 20, 1884. Fig. 2 is a side elevation of the vent detached. Figs. 3 and 4 are details in perspective, and Fig. 5 a substantially central longitudinal section of the automatic ventilator, parts being shown in dotted lines to illustrate the operation of the ventilator.

Like letters indicate like parts in all the figures.

A represents the body portion of the churn, which is mounted in a frame-work, B, of usual construction, by means of trunnions C, to one of which a crank, D, is fitted for revolving the churn; and A′ represents its discharge-orifice.

E represents the cover, having the radial locking-bars F and locking-bar operating cam G, provided with levers H, whereby the cover is secured to the churn in the manner clearly set forth in the patent referred to.

I represents a sight-hole, which is covered or closed with glass.

At J the cover is apertured for the reception of the automatic ventilator, K, which forms the subject-matter of my present invention.

The functions of the automatic ventilator on an apparatus of the character specified, and located either in the cover, as shown, or at any other desired portion of the apparatus, whether in its cover or body portion, are to permit the ingress or introduction of air into the body of the apparatus at a time during its revolution when the contents thereof are not in contact with that portion of the apparatus where the automatic ventilator is located, and at the same time to close the aperture in which it is mounted whenever said contents are in contact with said portion of the apparatus, and to perform this function automatically without the use of the hand and without the use of any devices mounted or arranged independent of the churn-body or the moving parts of the apparatus.

Referring now more particularly to Figs. 2 and 5, inclusive, it will be seen that the automatic ventilator K consists, essentially, of a valve, L, a valve-seat, M, a pendulous weight, N, and an intermediately-arranged valve-rod, O, which is hereinafter described as intermittingly inactive, to transmit the movements of the weight to the valve.

The intermittent inactivity of the valve-rod

is one of the important features of my invention. The valve-seat M is formed at the end of a tube, M′, adapted to pass through the aperture J, formed in the cover or other portion of the churn. Said tube has a shoulder, M^2, which bears upon the upper surface of the cover, and is drawn tightly against the same by means of a nut, M^3, screw-threaded upon the lower end of the tube, which nut bears upon the inner surface of the cover or other portion of the apparatus, and serves to render the fit of the vent as a whole water-tight. To secure this object, any suitable packing may be employed at either or both surfaces of the cover or other portion of the apparatus, and between said surface and the shoulder M^2 or nut M^3, as desired. The valve and its seat are preferably tapered, the former clearly shown at L′, Fig. 4, and above the tapered portion of the valve are the usual guides, L^2, for presenting the taper of the valve truly to its seat, and these terminate in an eye, L^3, which serves for the connection with the valve of the rod O, as clearly shown in Fig. 5. A frame, P, is projected upwardly from the shouldered end of the tube M′, and within the frame is mounted the pendulous weight N by means of a rod or pivots P′, which in this instance extend from side to side of the frame. Upon the rod or pivots P′ are loosely mounted the perforated lugs N′, formed as a part of or connected to the pendulous weight, which lugs in this instance project upwardly from a bar, N^2, and at the ends thereof, which bar is long enough to reach from side to side of the frame P to prevent lateral movement of the weight upon the rod. A depending slotted lug, N^3, is arranged centrally on the bar N^2, and the weight in this instance is arranged at one side of the center, and depends from the bar, so that the connection between the weight and the valve is central with the valve.

Now, it is apparent that minor details of construction may be varied from those herein shown and described, and I therefore do not limit my invention to such details, but reserve my right to alter the same in any manner and to any extent within the skill of persons conversant in the construction of similar devices and apparatuses.

This being the construction, the operation is as follows: When the body of the churn is substantially upright, the valve L is open, as shown in Fig. 2, and a line passing from the center of the valve through the connecting-rod to the pivot of the weight is parallel with a perpendicular line passing through the center of the weight. When the body of the churn is reversed, bringing the cover below, the pendulous weight assumes a position at one or the other side of the central line above described, so that a perpendicular line passed through the center of the weight is not parallel with said central line, and therefore the gravity of the pendulous weight is utilized as the effective means for holding the valve closed whenever the weight assumes the position mentioned. This function of the pendulous weight is required at any and at all times when the contents of the body are in contact with the cover, and preferably a short time before said contents approach the locality of the aperture in which the vent is secured.

Now, by reference to Fig. 5 the intermittent function of the devices employed for connecting the pendulous weight with the valve will be readily understood, in that the arrow in said figure indicates the direction in which the automatic ventilator is moving bodily with the cover of the churn, and that at the beginning of the revolution or shortly thereafter the pendulous weight draws the valve to its seat, and assumes at that time the position indicated by the full lines of Fig. 5. This position it retains until the cover and the automatic ventilator have passed beyond the half of a complete revolution.

Fig. 5 illustrates the exact relative position of the pendulous weight, the frame, the connecting-rod, and the valve at such a time in the revolution of the apparatus. While in this position the contents of the apparatus are directly against the valve of the automatic ventilator, and the weight being pendulous, it is necessary to provide some means whereby it may fall by gravity across the line passing from its pivot to the center of the valve without opening the valve, and I therefore have provided devices, hereinbefore described, which are capable of permitting the passage of the weight across said line without opening the valve. These devices involve any connecting-rod secured to the valve and to the pendulous weight or any part or adjunct thereof which move upon each other so that the movement of the weight in crossing said line shall not be communicated to the valve, but shall be absorbed or rendered without effect upon the valve by the movement of the connecting-rod and the weight or its adjunct upon each other. In passing across the line mentioned, the weight falls from the position shown in full lines in Fig. 5 to the position shown in dotted lines in said figure, the connecting-rod O riding in the slot of the lug N^3, to absorb the motion of the weight, in order that the valve shall not be moved from its seat, the connecting-rod therefore, and by reason of its adaptation to absorb the motion of the weight, being rendered ineffective, as above stated. The weight maintains the position shown in dotted lines until the revolution is very nearly or quite completed.

As before stated, I do not limit my invention to the exact details of construction provided for the absorption of the movement of the weight in crossing the hereinbefore-mentioned line passing directly from the pivot of the weight to the valve, but consider my invention as including and covering any of the well-known mechanical equivalents of the devices herein shown and described. In this instance the lug N^3 depends as a part of the weight below its pivots.

It is apparent from an inspection of Fig. 3 that the weight, its lug, the bar, and the pivot-lugs are formed in a single piece, although I do not confine my invention to such a construction of the weight and its adjuncts, and whether formed in one or more pieces the slotted lug N^3 and the rod O conjointly form what may be termed a "loose-jointed connecting-rod," and by these terms I mean any connecting-rod capable of permitting the passage of the weight as above described without operating the valve. In other words, I consider an intermittently-operating and inactive connecting-rod and a loose-jointed connecting-rod as equivalent devices for the purpose set forth.

Having described my invention and its operation, what I claim is—

1. The combination, with a vent-tube carrying a supporting-frame, of a valve, a pendulous weight, and a rod loosely connected wi h said valve and weight, substantially as specified.

2. The combination, with a liquid-receptacle, of a vent-tube, a valve, a pendulous weight journaled in the frame of said tube, and a rod loosely connecting the weight and valve, substantially as specified.

3. The combination of the tube M′, the valve L, the pendulous weight N, and a connecting-rod, O, loosely connected with the weight below its pivots, substantially as specified.

4. The combination of tube M′ and supporting-frame, as P, a pendulous weight, as N, pivoted within the frame, and provided with a slotted lug, N^3, and the connecting-rod O, loosely connected with said lug and pivotally connected with the valve L, substantially as shown and described.

5. The combination of the tube M′, provided with the valve-seat M, supporting-frame P, and the nut M^3, the valve L, adapted at L′ to fit said seat, and provided with the guides L^2 and eye L^3, and the weight N, provided with the bar N^2, pivoted lugs N′, the slotted lug N^3, and the rod O, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN G. PRITCHARD.

Witnesses:
M. CLARK,
E. CLARK.