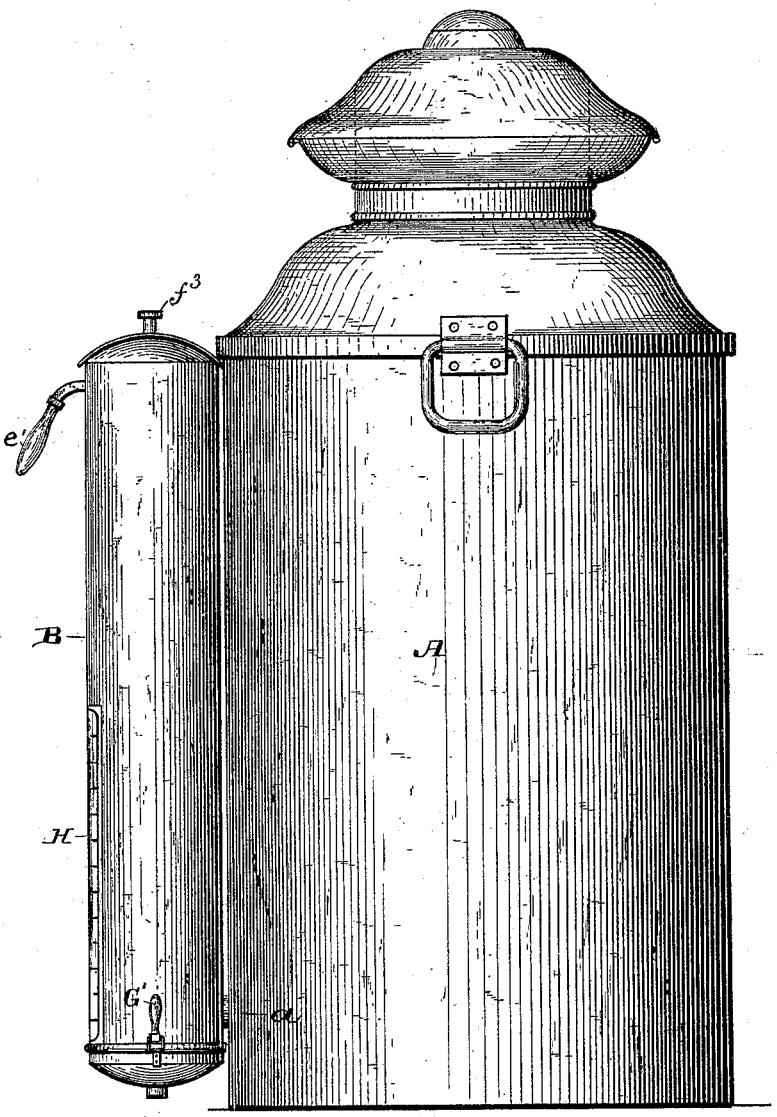
(No Model.) 2 Sheets—Sheet 1.

# H. P. & S. L. BARNHART.

## LIQUID MEASURING VESSEL.

No. 421,155. Patented Feb. 11, 1890.

FIG. 1.




ATTEST.

J. Henry Kaiser.

Frank M. Peck.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

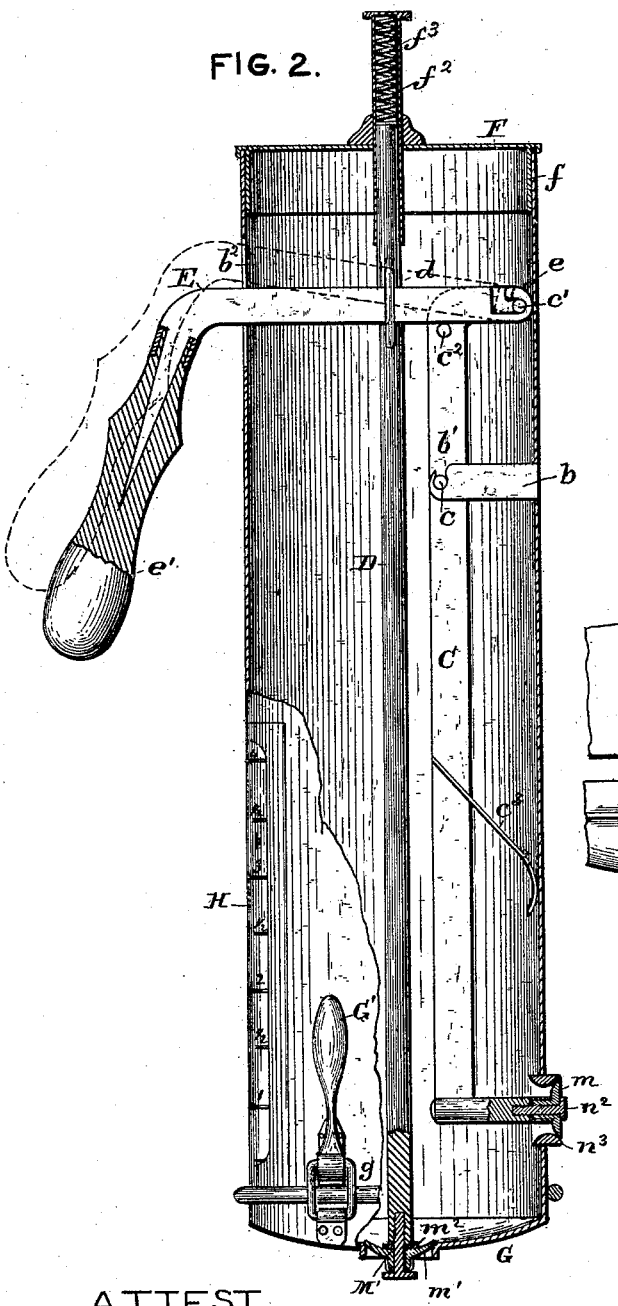



FIG. 6.

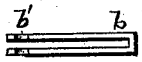



FIG. 3.

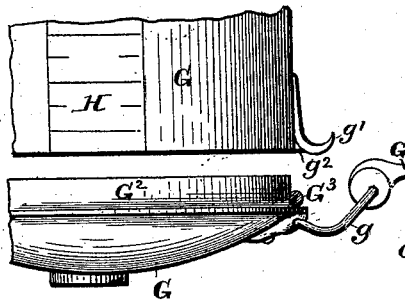
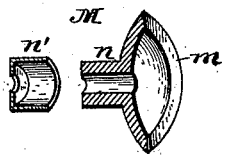



FIG. 4.


FIG. 5.




ATTEST.

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INVENTORS.

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# UNITED STATES PATENT OFFICE.

HARVEY PATTEN BARNHART AND SAMUEL LINDSEY BARNHART, OF POTSDAM, NEW YORK.

## LIQUID-MEASURING VESSEL.

SPECIFICATION forming part of Letters Patent No. 421,155, dated February 11, 1890.

Application filed June 29, 1889. Serial No. 316,104. (No model.)

*To all whom it may concern:*

Be it known that we, HARVEY PATTEN BARNHART and SAMUEL LINDSEY BARNHART, citizens of the United States, residing at Potsdam, in the county of St. Lawrence and State of New York, have invented certain new and useful Improvements in Liquid-Measuring Vessels, of which the following is a specification.

Our improvement has relation to measuring devices for liquids, such as can be readily adjusted to a large or original containing-vessel—such, *e. g.*, as is used for shipment purposes—and is designed more particularly for milk-dealers in selling milk by measure from the wagon while the same is being transported from house to house.

The design of our improvement is to provide means which will enable the vender to draw from the same can in one operation and measure out therefrom any stated or required number of pints or quarts or gallons or other predetermined quantity with exactness and dispatch without the necessity of subjecting the contents of the original containing-vessel to contamination or exposure by the removal of any cover or lid.

To this end our invention consists in the apparatus hereinafter described and illustrated in the accompanying drawings, wherein like characters indicate similar parts in the several views, and in which—

Figure 1 is a view showing in side elevation an ordinary milk-can with our measuring-vessel attached; Fig. 2, a view, partly in section, of the measuring-vessel, showing the operating parts, while Figs. 3, 4, 5, and 6 illustrate details, as hereinafter more particularly referred to.

A represents an ordinary milk-can, such as is usually employed in the transportation and shipment of milk. It is provided for use in connection with our measuring-vessel, as will be hereinafter described, with an opening or passage *a* in its vertical wall near the bottom of the can.

B is the measuring-vessel, preferably cylindrical in cross-section, open at each end, and provided with close-fitting covers.

Within the cylinder and near its top is firmly secured the fulcrum block or post *b*, having a forward projection into the vessel. This block is slotted, as shown in detail, (see Fig. 6,) and is provided near its free extremity with the depression or notch *b'*.

Within the slotted fulcrum-block rests the two-armed lever C, the pin *c* keeping the lever within the slot by means of its seat in the notch upon the extremity of the fulcrum-post. This lever C at its upper end terminates in an angular arm, carrying at its extremity the capped pin *c'*, projecting from one face, and carrying also at the junction of the arm with the lever the pin $c^2$, projecting from the same face as does capped pin *c'*. The lever C at its lower end also terminates in an angular arm, carrying at its extremity a flexible rubber-disk *m* of particular construction, operating as a valve in connection with an opening in the cylinder registering with the before-described opening *a* in the can A. At a point between the fulcrum-post and the lower arm of the lever C the said lever is provided with a spring $c^3$. This spring in this instance is of leaf-shape, projecting in an angular direction to bear against the wall of the cylinder with its curved free end.

D is the piston-rod extending centrally throughout the vessel B, carrying at its lower extremity a second flexible rubber disk *m'*, operating as a valve in connection with the discharge-opening in the bottom. At a point near the upper end of the piston-rod directly opposite the upper angular arm of the lever C is formed the loop *d*, through which extends the handled lever E, having in its forward end the L-shaped notch *e*, which engages the capped pin *c'* upon the forward extremity of the upper arm of lever C, thereby securing an upper and lower bearing on said pin. The other end of lever E projects through slot $b^2$ in the upper part of the wall of the measuring-vessel and terminates in the handle *e'*, having, as shown, a downwardly-inclined tilt. This loop *d* is elongated to such an extent that when the handled lever E is depressed the same will not come in contact with the loop. It is so attached to the rod, however, that when the lever E is lifted it will come in contact with the loop and force the rod upward.

F is the cover of the vessel B, having the

broad rim or flange $f$, which engages snugly the inner surface of the vessel. Centrally located within the cover is a tubular bearing $f^2$, which projects well above and below the top, the upper portion of the bearing being closed and carrying a spring $f^3$, which may be of any well-known form, as a block of india-rubber or a coil of wire, while the lower portion serves as a bearing or guide for the piston-rod. It is important that this cover be made, either by friction or by positive means, to engage firmly with the cylinder to prevent displacement by the action of the piston-rod.

The lower end of the vessel is provided with detachable bottom G. (See Fig. 3.) This bottom is adapted to be held securely to its seat upon the lower end of the vessel by two cam-levers G′ G′, (see Fig. 3,) secured upon opposite sides of the bottom and engaging each, by means of a shackle $g$, with a broad, flat hook $g'$, firmly riveted upon the outer periphery of the vessel, just above its lower edge. The bottom is provided with a rim or flange $G^2$, fitted to exactly engage with the inner face of the vessel's lower edge. This lower edge is also rimmed or outwardly flanged, as at $g^2$.

To guard against leakage, an elastic packing-ring $G^3$ is provided of such a size as to go over the rim $G^2$ and be compressed between that portion of the detachable bottom outside of the flange or rim $G^2$ and the cylinder-flange $g^2$, making thus a closure absolutely tight when the cam-levers G′ G′ are swung up and by means of their shackles are made to engage with the hooks. The cams, it is noted, are so timed with relation to the levers, the shackles bearing them, and the hooks with which they engage that the levers when swung up against the wall of the vessel each forms therewith a toggle-lock which can be broken only by pulling the lever out past the line of vertical strain, when the expansion of the elastic packing-ring, as well as the operation of gravity, will tend to finish the separation of the parts.

H is an ordinary graduated scale secured to the front of the vessel in such position as to be readily observable, the scale-marks being accurately determinative of the quantity of fluid within the measuring-vessel when at the level of the mark indicated.

The construction of the inlet-valve M is shown in Fig. 5, wherein the flexible rubber concavo-convex disk $m$ is provided upon its convex or bearing surface with a projection or hub $n$, perforated and provided with a thimble $n'$. Through the disk, hub, and surrounding thimble passes the screw-threaded bolt $n^2$, firmly holding the disk upon the extremity of the arm. When the two-armed lever is slid into its place, the rubber disk is readily forced through the tubular bearing $n^3$, which connects the respective openings in can A and measuring-vessel B. Being of flexible material, the disk immediately returns to its normal shape and operates at once as a valve upon its seat.

The outlet-valve M′ is a modification of inlet-valve M, wherein the convex face is provided with a washer $m^2$ and the screw-threaded bolt fastens the disk to the piston-rod end, so as to present the convex surface to the valve-seat.

The parts being, therefore, as herein described, the operation is as follows: Can or tank A being filled with milk and the measuring-vessel B being properly attached thereto in any suitable manner, the inlet-valve M is held firmly upon its seat by means of the spring $c^3$, while the outlet-valve is held firmly to its seat in the bottom by means of the spring $f^3$, bearing upon the upper end of the piston-rod D. The operator takes hold of handle $e'$, and, bearing firmly down thereupon, tilts lever E, which action compresses spring $c^3$, the lever C rocking upon its fulcrum-pin $c$ in post $b$, and opens valve M. The handle is held an instant until the level of the milk in the cylinder reaches the graduated glass in the measuring-vessel at the notation giving the amount required, whereupon the operator withdraws the pressure on the handled lever, and the spring at once closes the inlet-valve. To discharge the contents of the measuring-vessel, the operator has only to lift upon the same handled lever E, whereupon piston-rod D is made to compress the spring $f^3$, and the outlet-valve M′ is opened. When the desired amount has been discharged, the lever is dropped, and the spring shuts the valve at once.

It will be observed that the engagement of the handled lever E with the two-armed lever C, in the manner described and shown, forms, for the purposes and function of the inlet-spring only, a junction which is the same in substance as if these two members were rigidly united. They are jointed and made partible, however, not only for ease and readiness of removal from the cylinder and replacement therein, but to secure, in connection with the piston-rod, a function which would be absent if their union were not flexible. When the cylinder is to be emptied, pin $c'$ upon lever C becomes the immediate fulcrum upon which the handled lever E rests and upon which the piston-rod is lifted. This transfer of the weight from fulcrum $b'$ to fulcrum $c'$ is a very important feature of our improvement, dependence upon this transfer being relied on to keep the inlet-valve shut while the outlet-valve remains open. It is to be observed that the fulcrum-post $b$ is of such projection from the wall of the vessel that the upper end or short arm of lever C, when the valve is closed, rests against the wall, as does also the slotted extremity of handled lever E, engaging with pin $c'$ thereon.

The advantages of this construction are apparent. We provide, first, a graduated measuring-vessel which can be attached to

any tank or can without difficulty, and which permits the operator to draw and deliver different stated quantities of milk with perfect accuracy, with the same measure, and from the same tank or can without readjustment or loss of time; secondly, to guard against the constant danger arising in the handling of milk, from foulness and the presence of disease-germs lodged in hidden and inaccessible parts of the carrying and delivering vessels, we have made our measuring device so capable of complete detachability that the absolute cleanliness of every part is easily securable, and this result is had with a readiness of replacement and simplicity of construction that is highly satisfactory in use, for, as may be readily apprehended from the foregoing description, when the cover and the detachable bottom have been each removed the cylinder is open at both ends, and the handled lever, the two-armed lever, and the piston-rod all become at once removable for the purpose of being subjected to a thorough cleansing in hot water and the later purifying and drying action of the sun; so, also, with the open-ended cylinder, as well as with the cover and the detachable bottom.

Having now therefore fully described the nature of our invention and particularly ascertained its character, what we desire to secure by Letters Patent of the United States, and claim as of our invention, is—

1. In a measuring-vessel having in its upper vertical wall a slot $b^2$, and in its lower vertical wall an inlet-opening, and in its bottom an outlet-opening, the combination, with the handled lever E, of the two-armed lever C, fulcrumed upon post $b$ and carrying inlet-valve M, the piston-rod D, carrying at its lower end outlet-valve M′, and having at its upper end loose engagement with said handled lever E, and means, as set forth, whereby, when the detachable handled lever E is engaged within the closed vessel with the upper end of lever C centrally fulcrumed, as at $b$, the said two levers become jointed to adapt the piston-rod to be lifted by the handled lever to open the outlet-valve without affecting the operation of the inlet-valve, as set forth.

2. The combination, in a measuring-vessel of the character described, of the handled lever E, having engaging means, as hook $e$, the two-armed lever C, mounted upon fulcrum-post $b$ and having upon one end means, as pins $c'$ and $c^2$, for engagement with said handled lever, and on the other inlet-valve M, the piston-rod D, engaged with handled lever by loop $d$ at its upper end and carrying outlet-valve M′ at its other, as set forth.

3. In a measuring-vessel having an inlet-opening in its vertical wall and an outlet-opening in its bottom, the combination, with the handled lever, of the piston-rod having means, as loop $d$, for detachable engagement with said lever, and carrying the valve which controls the outlet-opening, and the two-armed lever fulcrumed within the said vessel, and carrying upon one arm the valve controlling the inlet-opening and upon the other a device for engaging the said handled lever, whereby both the inlet and outlet valves are controlled by a single operating-lever, as set forth.

4. The graduated chamber having an inlet-opening and an outlet-opening, in combination with the handled lever, the piston-rod provided with valve M′, and the two-armed lever fulcrumed within the chamber and carrying upon one arm the valve M, carrying also the spring $c^3$ midway between the fulcrum and the valve, and having upon the extremity of the other arm means for engagement with the said handled lever, whereby the operation of filling and emptying the chamber is accomplished with a single set of means, as set forth.

5. The combination, with an open-ended measuring-vessel comprising a cylindric wall, a removable top, and a tight-fitting attachable and detachable bottom, of the handled lever, the inlet and outlet valves, the piston-rod carrying the latter, and the two-armed lever fulcrumed within the chamber and carrying the former, the several elements being detachable, whereby upon removal of the cover and bottom the operating parts of the measuring device may be readily taken out, cleansed, and returned, as set forth.

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Witnesses:
C. E. SANFORD,
F. M. PECK.