No. 661,476. Patented Nov. 6, 1900.

H. D. MACK.

MILK STRAINER.

(Application filed Feb. 3, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

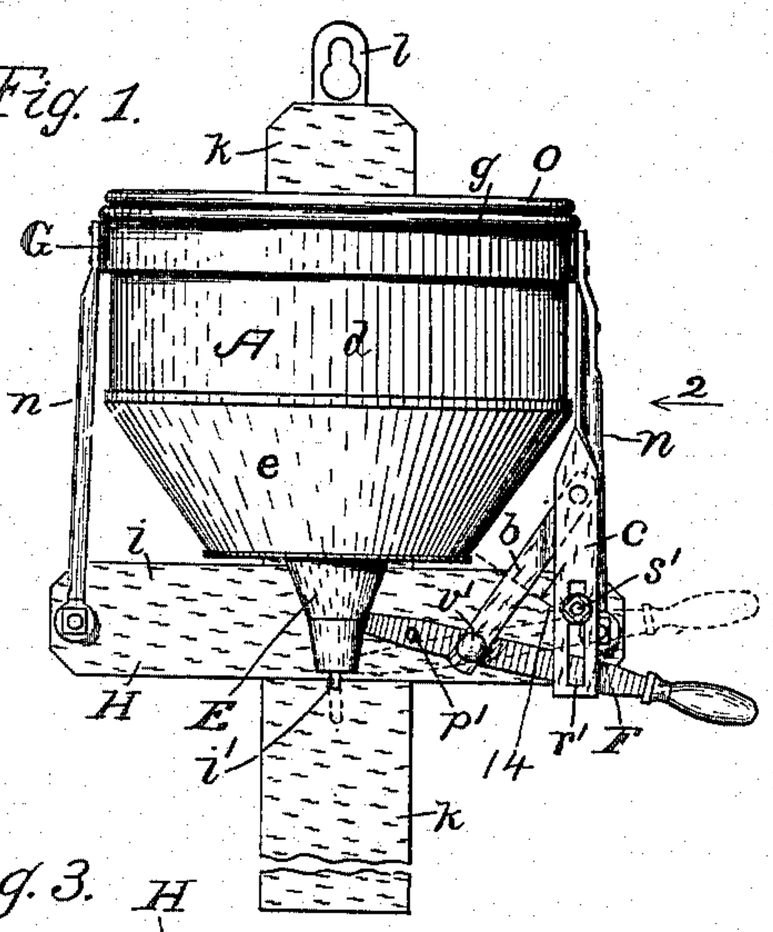


Fig. 2.

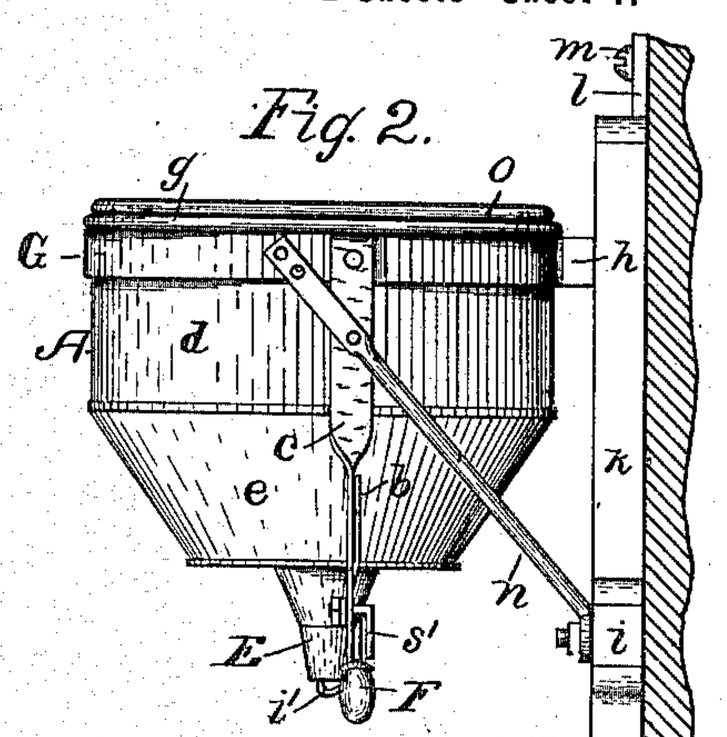


Fig. 3.

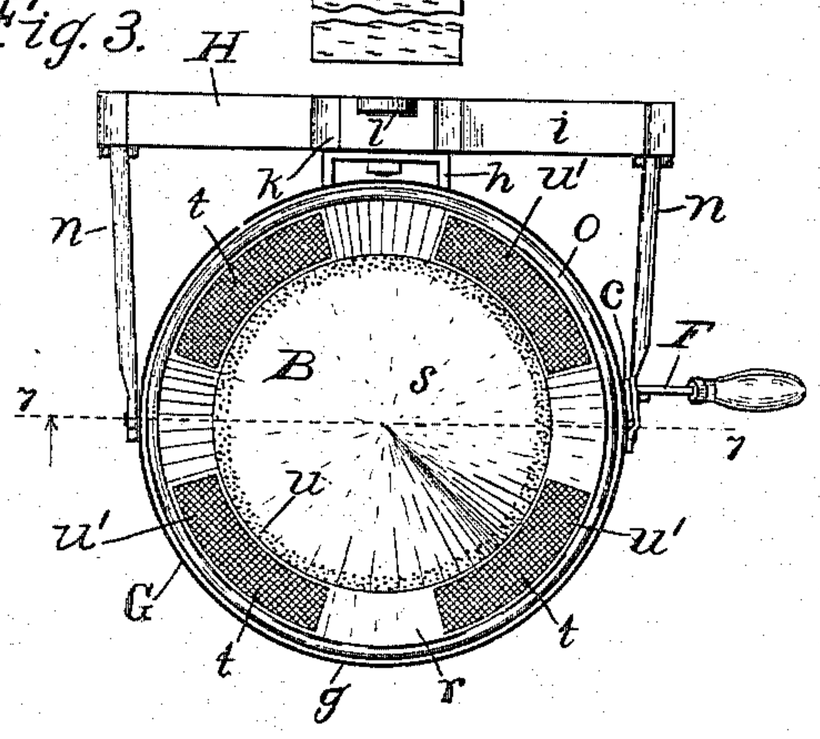


Fig. 4.

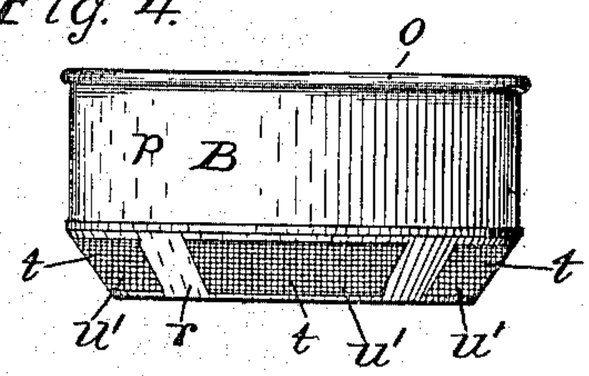


Fig. 5.

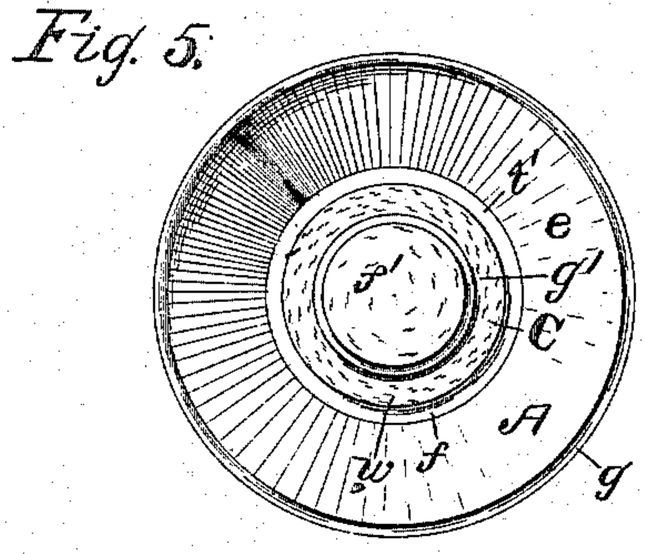
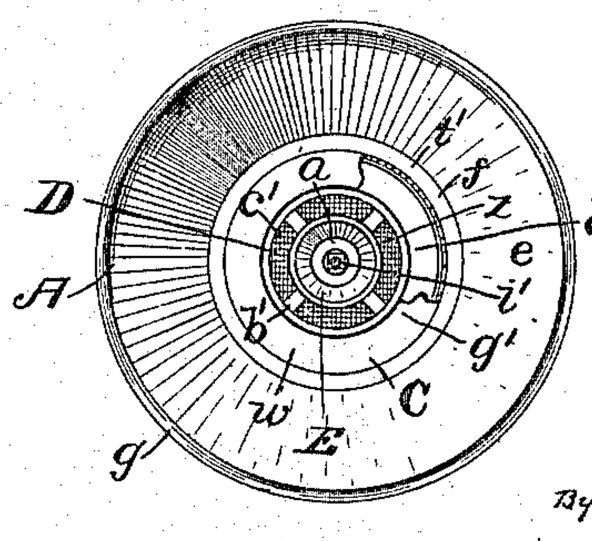


Fig. 6.



Attest:
M. L. Winston.
W. D. Phillips.

Inventor:
H. D. Mack,
By C. B. Whitmore, Atty.

No. 661,476. Patented Nov. 6, 1900.

H. D. MACK.

MILK STRAINER.

(Application filed Feb. 3, 1900.)

(No Model.)

2 Sheets—Sheet 2.

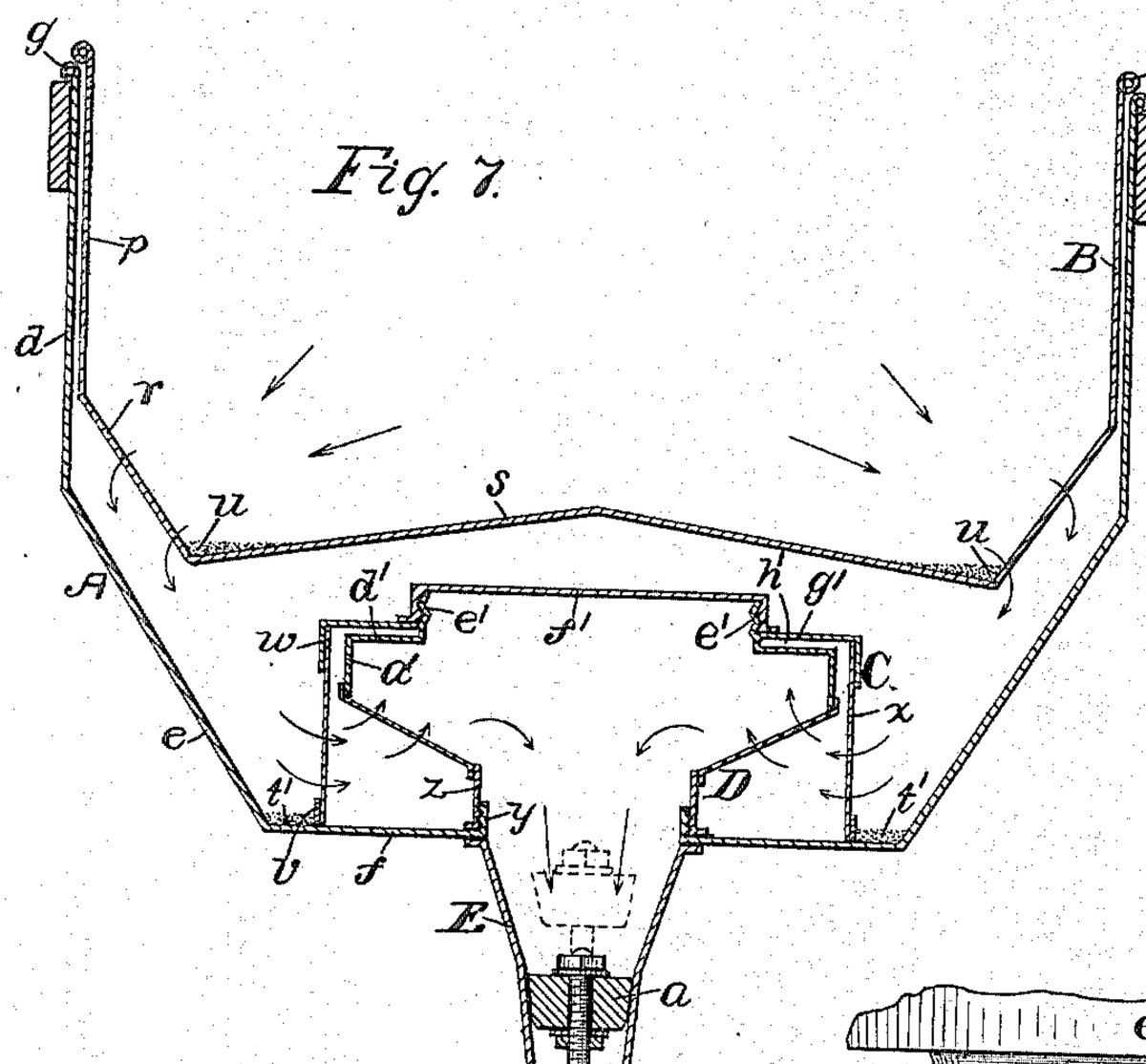


Fig. 7.

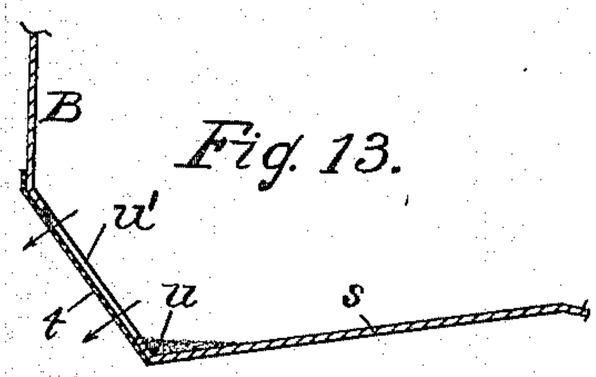


Fig. 13.

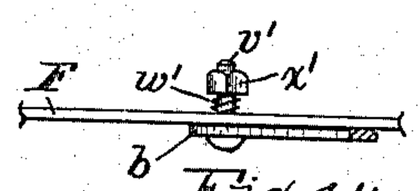


Fig. 14.

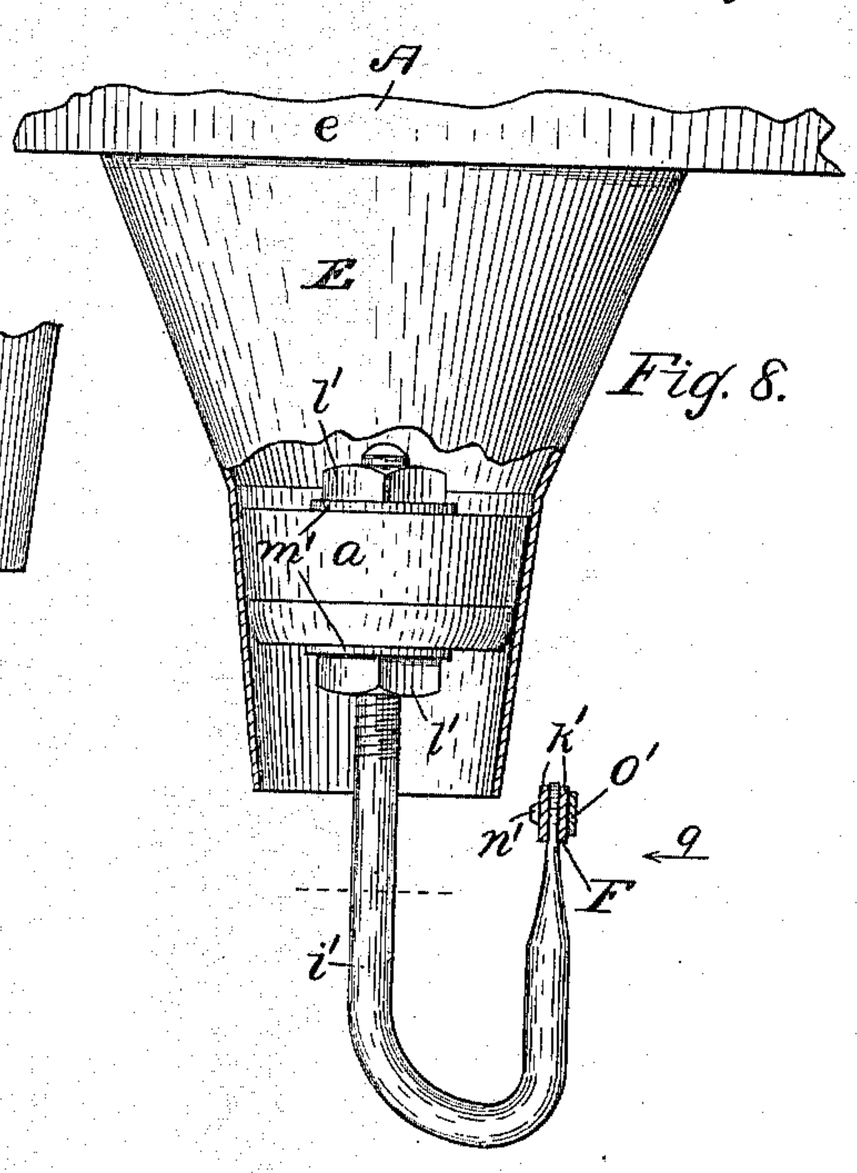


Fig. 8.

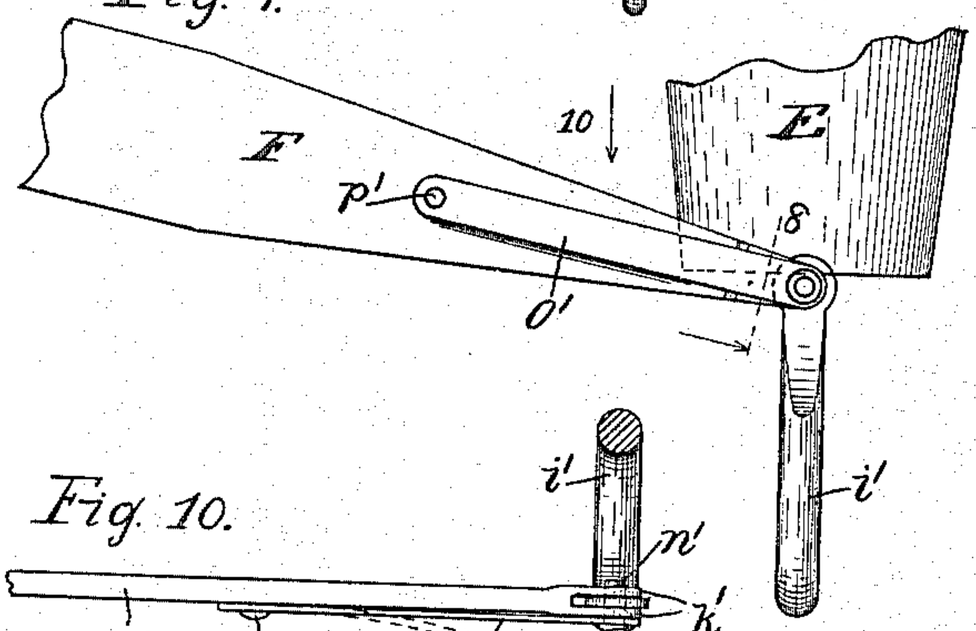


Fig. 9.

Fig. 10.

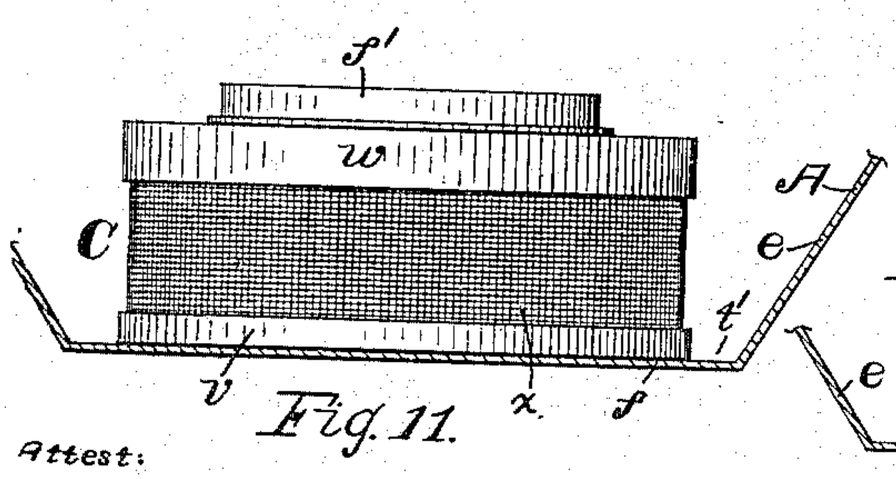


Fig. 11.

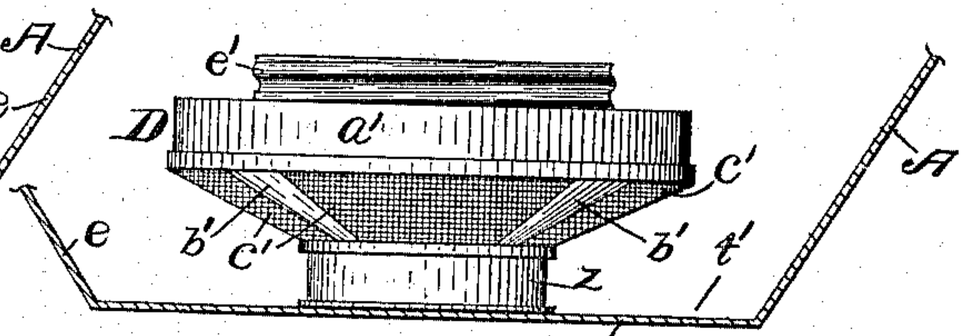


Fig. 12.

Attest:

N. G. Winston.

W. D. Phillips.

Inventor:

H. D. Mack,

By C. B. Whitmore, Atty

UNITED STATES PATENT OFFICE.

HEMAN D. MACK, OF BRIGHTON, NEW YORK, ASSIGNOR OF ONE-HALF TO ELIAS E. HALE, OF SAME PLACE.

MILK-STRAINER.

SPECIFICATION forming part of Letters Patent No. 661,476, dated November 6, 1900.

Application filed February 3, 1900. Serial No. 3,861. (No model.)

To all whom it may concern:

Be it known that I, HEMAN D. MACK, of Brighton, in the county of Monroe and State of New York, have invented a new and useful Improvement in Milk-Strainers, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is a milk-strainer consisting of various detachable and removable parts, the same being hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a front elevation of the device, parts being shown in two positions by full and dotted lines. Fig. 2 is a side elevation, seen as indicated by arrow 2 in Fig. 1. Fig. 3 is a view from over the device. Fig. 4 shows the primary strainer detached. Fig. 5 is a plan of the outer vessel with the primary strainer omitted. Fig. 6 shows the interior of the outer vessel with the primary strainer and the screw-cap of the inner strainer omitted, a part of the base-strainer being broken away. Fig. 7 is an axial section of the parts, taken on the dotted line 7 7 in Fig. 3. Fig. 8 is a side elevation of parts beneath the main outer vessel, seen in the direction in which Fig. 2 is seen, parts being vertically and centrally sectioned, the stop-lever and spring-holder being sectioned, as on the dotted line 8 in Fig. 9. Fig. 9 is a side elevation of some of the lower parts of the device, seen as indicated by arrow 9 in Fig. 8. Fig. 10 is an edge view of the lever and associated parts, seen as indicated by arrow 10 in Fig. 9, the spring-holder being shown in two positions by full and dotted lines. Fig. 11 is a side elevation of the base-strainer with the screw-cap resting thereon, the adjacent part of the outer vessel being vertically sectioned. Fig. 12 is a side elevation of the inner conical strainer with the screw-cap removed, adjacent parts of the outer vessel being vertically sectioned. Fig. 13 is a vertical section of a part of the primary strainer through one of the openings and a strainer-section. Fig. 14 shows the friction tension for the stop-lever, the fulcrum-bar being transversely sectioned on the dotted line 14 in Fig. 1.

Figs. 1 to 6, inclusive, and Fig. 14 are drawn to a scale about one-sixth full size; Figs. 7, 11, 12, and 13 to a scale something less that one-half size; the remaining figures being drawn full size.

A is the outer or main vessel, open at the top, and B an inner vessel or primary strainer, both preferably made of sheet metal.

C is an inner base-strainer, cylindrical in form, and D a central conical strainer within the base-strainer C.

E is a tapered or conical discharge-tube for the strained milk, secured centrally beneath the main vessel A, and *a* is a tapered stopper seated in the tube E to control the passage through it.

G is an iron band or ring encircling the outer vessel A to support it and other parts, the band being secured rigidly to a wooden holder or support H, the latter being held by simple means to a wall I, a post, or other convenient fixed part or body.

K is a shipping-can, or it may be other vessel, large or small, resting upon the floor L to receive the milk from the strainer.

F, Figs. 1, 3, and 9, is a hand-lever for controlling the stopper *a*, Fig. 8, fulcrumed upon a bar *b*, secured to a hanger *c*, pending from the iron band G.

The main vessel A consists of a cylindrical part *d*, Fig. 7, and a conical part *e*, it having a straight bottom *f*, with opening at the center. At its upper edge this vessel is formed with a projecting roll or bead *g* to rest upon the supporting-band G, the latter having a rearward projection *h*, Figs. 2 and 3, where it meets the support H. This support is preferably made in the form of a cross, consisting of a main vertical member *k* and a cross-bar *i*, the support being secured to the wall, as by means of a loop *l*, passed over a stud or screw *m* in the wall. The band G is stiffened in its position by means of braces *n n*, secured to the member *i* of the support H.

The inner vessel or primary strainer B is supported by means of a projecting bead *o* at its upper edge, resting upon the bead *g* of the vessel A. This inner vessel is made up of a cylindrical part *p*, Fig. 7, a downwardly-projecting conical part *r*, (see also Fig. 3,) and an upwardly-projecting conical bottom *s*. The conical part *r* is formed with open-

ings u', Figs. 3, 4, and 13, and provided with perforated sheets t to cover said openings, through which perforations the milk turned into the vessel B first passes in the operation of straining. Between the inclined or conical parts r and s is formed a circular depressed part or valley u, Figs. 3, 7, and 13, into which the sediment or extraneous matter in the milk settles, as indicated. The lower edges of the openings u' being some distance above the bottom of the valley, the sediment settles below the openings and is not caused to lodge against the strainers t and be carried through them, the milk flowing through the strainers as it is turned into the vessel B passing over the collected sediment. When sediment thus collects in the vessel B, the latter may be readily removed from the outer vessel A and freed from the matter or cleansed before more milk is turned in. This is believed to be important, as if the sediment is allowed to remain long in place and be washed by the inflowing milk certain parts of it are liable to become comminuted or dissolved and so be carried through the strainers with the flowing milk.

There is space below the vessel B, Figs. 7 and 11, in which is placed the base-strainer C, cylindrical in form, as shown. This strainer consists of a base-ring v, to rest on the bottom f of the vessel A, and an upper flanged ring w, equal in diameter with the ring v, and a perforated band x, connecting the rings v and w, through which the milk flows inwardly after passing the vessel B. Within the base-strainer C the central conical strainer D rests, Figs. 7 and 12, screw-threaded at its lower end onto an upwardly-projecting threaded rim y of the vessel A. This central strainer comprises a lower broad band z and a separate upper flanged band a' of larger diameter, joined by inclined cross-tie pieces b', to which are secured conical sections c' of wire-cloth to cover the openings between the tie-pieces and the bands. The milk in flowing through the device passes obliquely upward through the sections of wire-cloth c' and so on downward through the discharge-pipe E, as indicated.

The horizontal flange d', Figs. 6 and 7, of the band a' is formed with an upwardly-turned threaded part e', upon which is placed a screw-cap f' in position to bear upon the flange g' of the base-strainer C. A space h' being left between said opposing flanges, the upper one yields when the screw-cap is turned down against it, causing the base-strainer to bear against the bottom plate f of the vessel A with a yielding pressure. The screw-cap f' thus serves to hold the base-strainer in place, and when removed the base-strainer may be taken out of the vessel A. The opening through the part e' of the central strainer D being large allows ready access to the interior of said strainer for the purpose of cleaning, the strainer being also removable by unscrewing it from the flange or ring y.

It will be observed that all of the perforated strainers t, x, and c' are either vertical or inclined, there being no horizontal strainers. Also it will be observed that in every case there is space or a depressed part below the lower edge of every strainer for the reception of sediment, this being for the purpose of keeping the latter away from the perforations. In case milk-strainers are so constructed that soluble masses of extraneous matter are held by gravity against the perforated parts such masses are tumbled and abraded by the successive inpouring of milk, thus becoming reduced or dissolved and carried onward in the milk as it flows from the strainer. This objection in constructing my present invention I have studiously aimed to avoid. As shown in Figs. 7, 11, and 12, extraneous matter that may reach the bottom of the outer vessel A in any case is held in the space t' below the perforated part x or the perforated sheets c' in case any passes through the former sheet or in case at any time the base-strainer C may be temporarily unused.

It is sometimes desirable to dispense with either the vessel B or the base-strainer C—as, for instance, when the milk poured into the device is comparatively free from extraneous matter. The parts B, C, and D, when all are used, constitute a progressive series of strainers, sifting from the milk substantially all the contained impurities not held in solution.

The hand-lever F is connected with the stopper a by means of a bent rod i', which at one end passes centrally through the stopper and at the other end is flattened to enter between jaws k' of the lever. At the stopper the rod is threaded and provided with opposing screw-nuts l' l', washers m' m' being inserted between the screw-nuts and the stopper. By means of this arrangement the stopper may be vertically adjusted upon the rod. The lever and the rod i' are pivotally connected by means of a pin n', rigid in a spring-bar o', held at p' rigid with the lever. By drawing the spring and the pin back, as indicated in Fig. 10, the stopper may be removed for the purpose of cleansing or renewal.

The hanger c is formed with a vertical slot r', Figs. 1 and 2, near its lower end, in which rests a bent guide s' for the lever F. This guide serves to hold the lever against the hanger, and being vertically adjustable in the slot is adapted to act as a stop for the upward motions of the lever to prevent the tapered stopper being drawn too tightly into its tapered seat in the outflow-pipe E. The fulcrum-pin v', Figs. 1 and 14, of the lever F is provided with a simple spring w' under the screw-nut x' to give the lever an adjustable friction tension. By this means the lever may be controlled to hold the stopper a at any desired position in the pipe E to control the outflowing stream of milk. If, for instance, the milk to be strained in any case carry an unusual quantity of extraneous

matter, it is desirable to have it flow moderately or even sluggishly through the strainers to prevent carrying objectionable matter with it, as would be the case if it flowed rapidly through them. By holding the stopper *a* in a position to partially close the passage through the discharge-pipe E the rate of the flow of milk may be reduced or regulated at pleasure. The construction of the parts is such that the capacity of the pipe E, when unobstructed by the stopper, is less than the capacity of the combined perforations in either strainer B, C, or D.

This milk-strainer is designed to be made of such size that pailfuls of milk may be turned into it in moderately rapid succession, and when a can K is filled the outflowing stream may be instantly shut off by means of the hand-lever and the filled can replaced by an empty one.

What I claim as my invention is—

1. A milk-strainer comprising an outer or main open vessel with an opening at the bottom, a removable vessel supported within the outer vessel and consisting of a cylindrical part, a downwardly-projecting conical part, and an upwardly-projecting central imperforate conical part, said downwardly-projecting part having openings through it above the junction of the two conical parts to form a sediment-dam, and perforated sheets to cover said openings, substantially as shown and described.

2. A milk-strainer comprising a straining vessel having perforated sections or areas near the bottom, the bottom of the vessel being imperforate and elevated at the middle, with a valley adjacent to and below the apex of the bottom to form a sediment-dam below the perforated sections, and an inclosing vessel for said straining vessel, substantially as and for the purpose set forth.

3. A milk-strainer comprising a vessel open at the top and having imperforate bottom elevated at the center with a valley adjacent to the outer edge, perforated sections intermediate said bottom and the outer walls of the vessel otherwise than horizontal, a strainer beneath the same having imperforate top, vertical perforated portions, and a strainer within the same having inclined perforated sections, all substantially as shown and described.

In witness whereof I have hereunto set my hand, this 30th day of January, 1900, in the presence of two subscribing witnesses.

HEMAN D. MACK.

Witnesses:

E. B. WHITMORE,

M. L. WINSTON.