No. 757,733. PATENTED APR. 19, 1904.

L. A. FRANK.

LOCK.

APPLICATION FILED OCT. 5, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

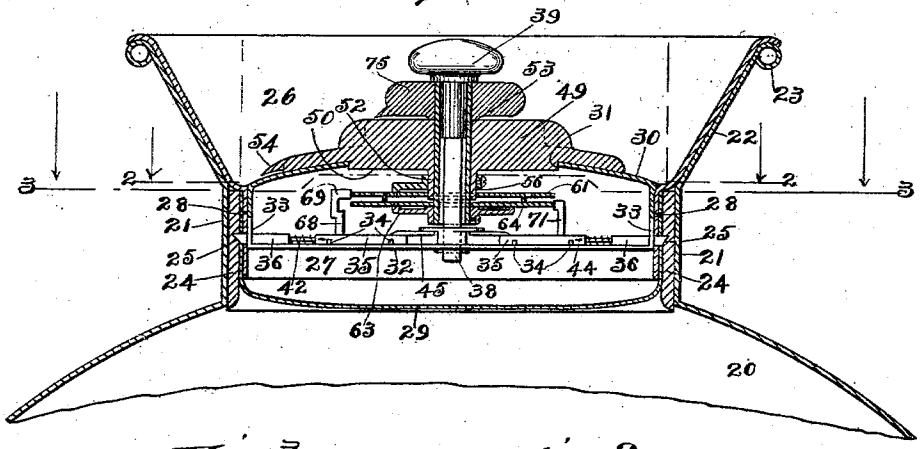


Fig. 3.

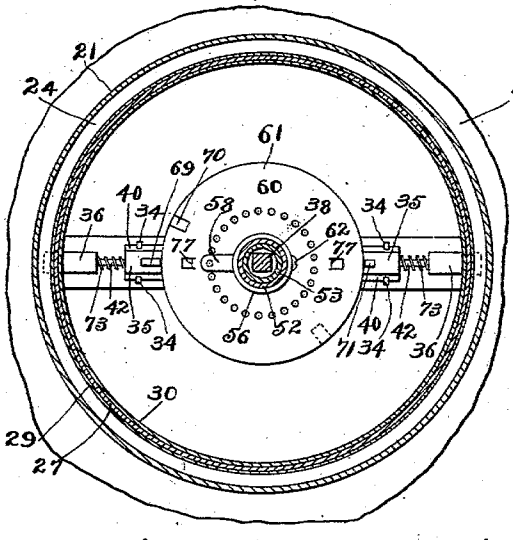


Fig. 2.

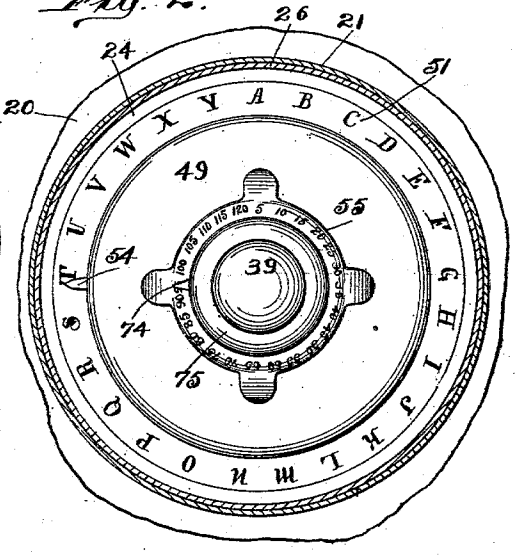


Fig. 4.

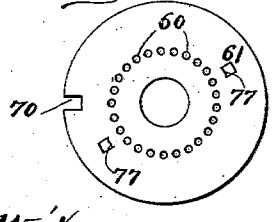


Fig. 5.

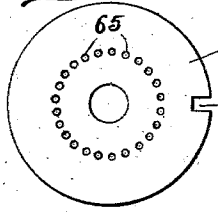
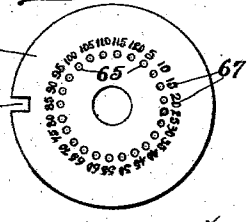


Fig. 6.

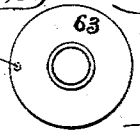


Witnesses:

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Fig. 7.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 8.

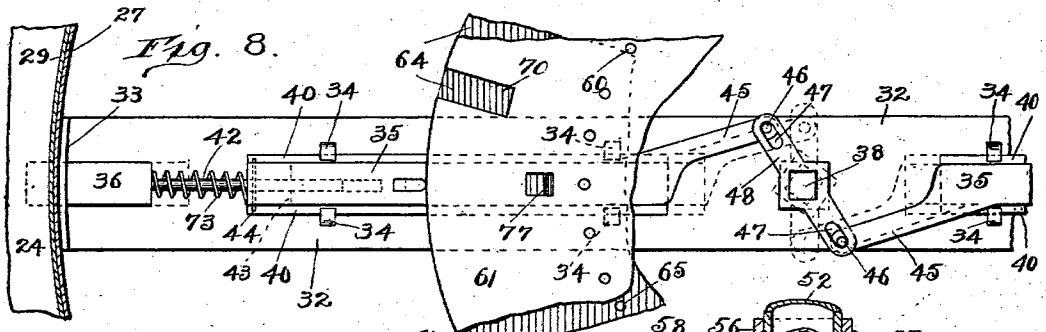


Fig. 9.

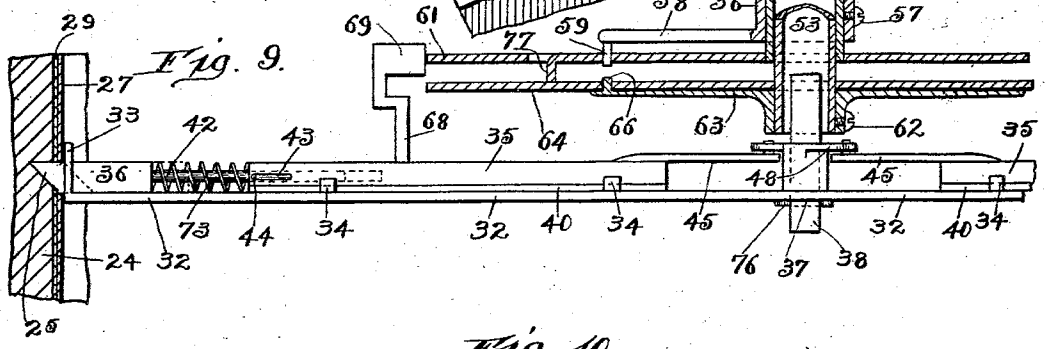


Fig. 10.

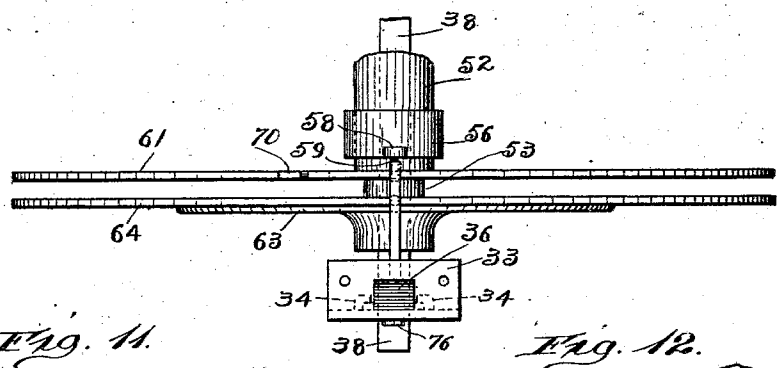


Fig. 11.

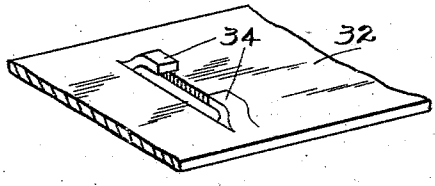
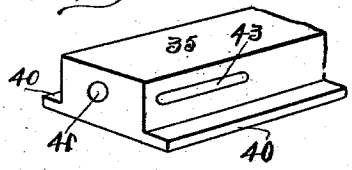


Fig. 12.



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No. 757,733. Patented April 19, 1904.

UNITED STATES PATENT OFFICE.

LOUIS A. FRANK, OF CHICAGO, ILLINOIS.

LOCK.

SPECIFICATION forming part of Letters Patent No. 757,733, dated April 19, 1904.

Application filed October 5, 1903. Serial No. 175,745. (No model.)

To all whom it may concern:

Be it known that I, LOUIS A. FRANK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locks for Vessel-Covers, of which the following is a specification.

This invention relates to improvements in that type of locks known as "combination-locks," and while it is more especially intended for use on covers for milk-cans, and in the present instance I have shown it in connection with such a cover and will so describe it hereinafter, yet it is with slight changes in construction applicable as a lock for the covers of other vessels and for other purposes.

The principal object of the invention is to provide a lock of the above-named character which shall be of simple construction and so made that the cover may be automatically secured in place in such a manner that it cannot be removed except by a person cognizant with the combination of the lock.

Another object is to so construct the parts as to prevent milk or other material entering the casing which incloses the locking mechanism.

A further object is to provide means to permit of easy access to said mechanism when it is desired to change the combination or to clean the parts.

With the foregoing and other objects and advantages hereinafter to be enumerated in view the invention consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a central vertical view, partly in section and partly in elevation, of a lock embodying my invention, showing it applied to the cover of a milk-can and illustrating the same locked in position. Fig. 2 is a plan sectional view taken on line 2 2 of Fig. 1, showing a portion of the milk-can and illustrating the graduated dials of the lock. Fig. 3 is a similar view taken on line 3 3 of Fig. 1, showing the interior of the locking mechanism. Fig. 4 is a detached plan view of the upper regulating-disk. Fig. 5 is a similar view of the lower regulating-disk. Fig. 6 is a bottom plan view of the lower regulating-disk. Fig. 7 is a detached bottom plan view of the keeper-plate for the lower disk. Fig. 8 is an enlarged fragmental plan view of the upper and lower regulating-disks and the locking-bolts, showing the latter extended. Fig. 9 is a vertical view, partly in section and partly in elevation, thereof. Fig. 10 is a view in elevation, showing the edges of the regulating-disks, looking from the end of one of the locking-bolts. Fig. 11 is a perspective view of a portion of the supporting-bar for the locking-bolts, and Fig. 12 is a similar view of a portion of one of the sliding blocks.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference-numeral 20 represents a milk-can of the ordinary type which is contracted to form a neck 21, the upper portion of which is flared, as at 22, and is provided with a bead 23 around its rim. Located in the neck 21 is a ring 24, which is provided on its inner surface with an annular groove 25 to receive the outer ends of the locking-bolts. As will be seen by reference to Figs. 1, 8, and 9 of the drawings, the groove 25 has its lower surface beveled and its upper surface located in a horizontal plane. The cover which comprises the casing for the locking mechanism consists of a circular flaring portion 26, provided at its lower end with a cylindrical portion 27 to fit in the neck 21 of the can. Fitted around the portion 27 and detachably secured thereto by means of screws 28 is a basin-shaped bottom 29, which when in position on the portion 27 will fit snugly within the ring 24, as is clearly shown in Fig. 1 of the drawings. Secured within the upper portion of the part 27 of the cover and secured thereto is a top

30, which is provided with a central opening 31 to receive one of the graduated dials and to permit of the regulating mechanism being removed from the casing formed by the portions 27, 29, and 30, as will be presently explained. Located diametrically across the portion 27 is a bar 32, which supports the locking-bolts. This bar has at each of its ends an upturned apertured flange 33, which are secured to the inner surface of the walls of the part 27 of the cover. The walls of the bottom 29, as well as those of the part 27, are provided with openings at points to register with the openings in the flanges 33 of the bar 32 for the operation of the locking-bolts. The bar 32 is formed or provided on its upper surface with a number of inturned lugs 34, which are arranged in pairs to furnish guideways for the sliding blocks 35, which carry the locking-bolts 36, which bolts have their outer ends beveled, as shown, to correspond with the shape of the groove 25 in the ring or piece 24, which serves to reinforce the neck of the can as well as to furnish a socketed piece for said bolts. As shown, the bar 32 is provided in its middle with an opening 37 to receive the operating stem or spindle 38, the lower portion of which is angular in cross-section, while its upper part is cylindrical and is provided with a knob 39 used for turning the same when it is desired to retract the locking-bolts 36, so as to unlock the cover. As will be observed by reference to Figs. 1, 8, and 9 of the drawings, one of the sliding blocks 35 is located on each side of the operating-spindle 38 and will be guided in their movements by means of the lugs 34, which overlap the flanges 40 on the lower portion of each side of said blocks. The outer end of each of the blocks 35 is provided with a longitudinal opening 41 for the reception and operation of the rods 42, with which each of the locking-bolts 36 is provided on its inner end. Each of the blocks 35 is provided near its outer end with a transverse slot 43 for the operation of a pin 44, which is located in a suitable opening in the inner end of the rods 42, which pin prevents the accidental dislocation of said rod. The inner end of each of the blocks 35 is provided with an obliquely-extending arm 45, which carries a pin 46 to engage slots 47, formed in the ends of the double crank or bar 48, which is mounted on the operating-spindle 38, so as not to turn thereon.

Located on the upper surface of the top 30 of the cover is a dial 49, which has on its lower surface a circular projecting portion 50 to fit in the opening 31 of the cover 30, which is provided near its periphery with a graduated scale 51 and the letters of the alphabet or other characters. The dial 49 has a central opening and is provided on its lower surface around said opening with a hollow projection 52, which opening and projection receive a tubular spindle 53, which surrounds the spindle 38, as shown in Fig. 1 of the drawings. The dial 49 is provided at a suitable point with a pointer 54 to indicate on the scale 51 the point to which it may be turned, and has on its upper portion a graduated scale 55 with numerals or other characters. Located around the hollow projection 52 of the dial 49 is a collar 56, which is fixed to said projection by means of a set-screw 57 and has a laterally-extending arm 58, provided with a depending pin 59 to engage the openings 60 in the upper regulating-disk 61, which is mounted on the lower portion of the projection 52, as is clearly shown in Figs. 1 and 9 of the drawings. Fixed on the lower portion of the tubular spindle 53, by means of a screw 62 or otherwise, is a supporting-plate 63, for the lower regulating-disk 64, which is mounted on the tubular stem 53 and has a number of openings 65 arranged in a circle around its central opening to receive an engaging pin 66 on the upper surface of said plate. The lower surface of the disk 64 is provided with a scale and numerals 67 to correspond with the scale 55 on the dial 49, and the upper disk 61 is provided with a number of openings 60 to correspond with the number of characters on the scale 51 of the top of the cover. Extending upwardly from one of the sliding blocks 35, so as to impinge the periphery of the upper disk, is a standard 68, which has at its top a lateral projection 69 to fit in the recess 70 of the upper disk when it is desired to retract the locking-bolts. The other sliding block is provided with an upright standard 71 to impinge the periphery of the lower disk 64 and to fit in the recess 72 thereof, when the locking-bolts are retracted. While I have shown the standards 68 and 71 as being located on opposite sides of the operating-spindle, yet it is apparent that one only may be employed, which may be formed without the lateral projection, in which case the recesses in the disks should register with one another. Surrounding each of the rods 42 of the locking-bolts and interposed between the inner ends thereof and the outer ends of the sliding blocks are spiral springs 73, which normally project said bolts, yet will allow them to yield sufficiently to engage the groove 25 when the cover is pressed downwardly, thus automatically locking the cover in position.

From the foregoing and by reference to the drawings it will be seen and clearly understood that by adjusting the upper disk 61 and fixing it by means of the pin 59 on the arm 58 in one of the holes 60, so that the recess 70 in said disk will register with the pointer 54 on the dial 49, and that by turning said dial to a certain point—for instance "T" on the scale 51—the recess 70 may be brought into aline-

ment or so as to receive the upper portion of the standard 68 on one of the sliding blocks. By adjusting the lower disk 64 and securing it by means of the pin 66 on the supporting-plates 63 in one of the holes 65, so that the numbers of the scale 67 on its lower surface will register with those of the scale 55 on the dial 49, and by turning the knob 75, located on the upper end of the tubular spindle, so that the pointer 74 on said knob will indicate a certain number on the scale 55—for instance, "95"—the disk 64 may be turned so that the recess 72 therein will register with or be placed in position to receive the standard 71, when the locking-bolts may be retracted.

When the parts are arranged as above described, it is apparent that the cover may be removed from the vessel, when by detaching the bottom 29 of the casing for the locking mechanism and removing the pin 76, which is located in a transverse opening in the spindle 38 below the bar 32, from said spindle the disks, spindles, and dials may be removed through the opening 31 in the top of the casing, so that the disks may be suitably adjusted to change the combinations.

In order to hold the disks 61 and 64 a slight distance apart and when desired to create friction between the two, one of the disks, usually the upper one, 61, is provided with lugs 77, which will rest on the upper surface of the lower disk. It is apparent that by moving either of said disks on the tubular spindle 53 friction between them may be increased or diminished, so as turn easily or with more difficulty.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a vessel having in its opening a recess, of a cover to close the opening, a hollow spindle rotatably located in the cover, a dial fixed to the upper portion of said spindle and resting on the top of the cover, an operating-spindle located in the hollow spindle and having on its upper end a knob, a disk adjustably mounted on the hollow spindle below the top of the cover and having a recess in its periphery, a spring-actuated locking-bolt located in an opening in the wall of the cover to engage the recess in the opening of the vessel, means connecting the lower portion of the operating-spindle and the locking bolt to retract the latter when said spindle is turned, and a standard on said connecting means to impinge the periphery of the disk when the bolt is projected and to fit in the recess thereof when said bolt is retracted.

2. The combination with a vessel having a recess in its opening, of a cover to fit in and close said opening, a hollow spindle rotatably located in the cover, a dial fixed on the upper portion of said stem and resting on the top of the cover, an operating-spindle located in the hollow spindle, an upper and lower disk adjustably mounted on the hollow spindle below the top of the cover and each having a recess in its periphery, spring-actuated locking-bolts located in openings in the walls of the cover to engage the recess in the opening of the vessel, means connecting the lower portion of the operating-spindle and the locking-bolts to retract the latter when said spindle is turned, and a standard on said connecting means to fit in the recesses of the disks when the bolts are retracted.

3. The combination with a vessel having in its opening a recess, of a cover to close the opening, a hollow spindle rotatably located in the cover, a dial fixed to the upper portion of said spindle and resting on the top of the cover, an operating-spindle located in the hollow spindle and having on its upper end a knob, a disk adjustably mounted on the hollow spindle below the top of the cover and having a recess in its periphery, spring-actuated locking-bolts located in the openings in the walls of the cover to engage the recess in the opening of the vessel, means connecting the lower portion of the operating-spindle and the locking-bolts to retract the latter when said spindle is turned, and a standard on said connecting means to impinge the periphery of the disk when the bolts are projected.

4. The combination with a vessel having a recess in its opening, of a cover to fit in and close said opening and provided with a scale on its top, a hollow spindle rotatably located in the cover, a dial fixed to the upper portion of said spindle and resting on the top of the cover, an operating-spindle located in the hollow spindle and having on its upper end a knob, an upper and lower regulating-disk adjustably mounted on the hollow spindle and each having a recess in its periphery, spring-actuated locking-bolts located in openings in the walls of the cover to engage the recess in the opening of the vessel, means connecting the lower portion of the operating-spindle and the said bolts to retract the latter when the spindle is turned, and a standard located on the connecting means on each side of the operating-spindle to fit in the recesses of the disks when the bolts are retracted.

5. The combination with a vessel having an annular groove in its opening, of a cover to fit in and close said opening and provided with a scale on its top, a hollow spindle rotatably located in the cover, a dial fixed to the upper portion of said spindle and located above the top of the cover, an operating-spindle located in the hollow spindle and having on its upper end a knob, an upper and lower regulating-disk adjustably mounted on the hollow spindle below the top of the cover and each having a recess in its periphery, a supporting-

bar secured diametrically within the cover and having guideways on its upper surface, a sliding block located within the guideways of the supporting-bar on each side of the operating-spindle and connected thereto, a spring-actuated locking-bolt movably secured to the outer end of each of the sliding blocks and extending through openings in the walls of the cover, and a standard mounted on one of the sliding blocks to fit in the recesses of the regulating-disks when the locking-bolts are retracted.

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Witnesses:
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A. GUSTAFSON.