Aug. 7, 1951 C. E. BROWNELL 2,563,456

RECEPTACLE CLOSURE

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Fig. 1.

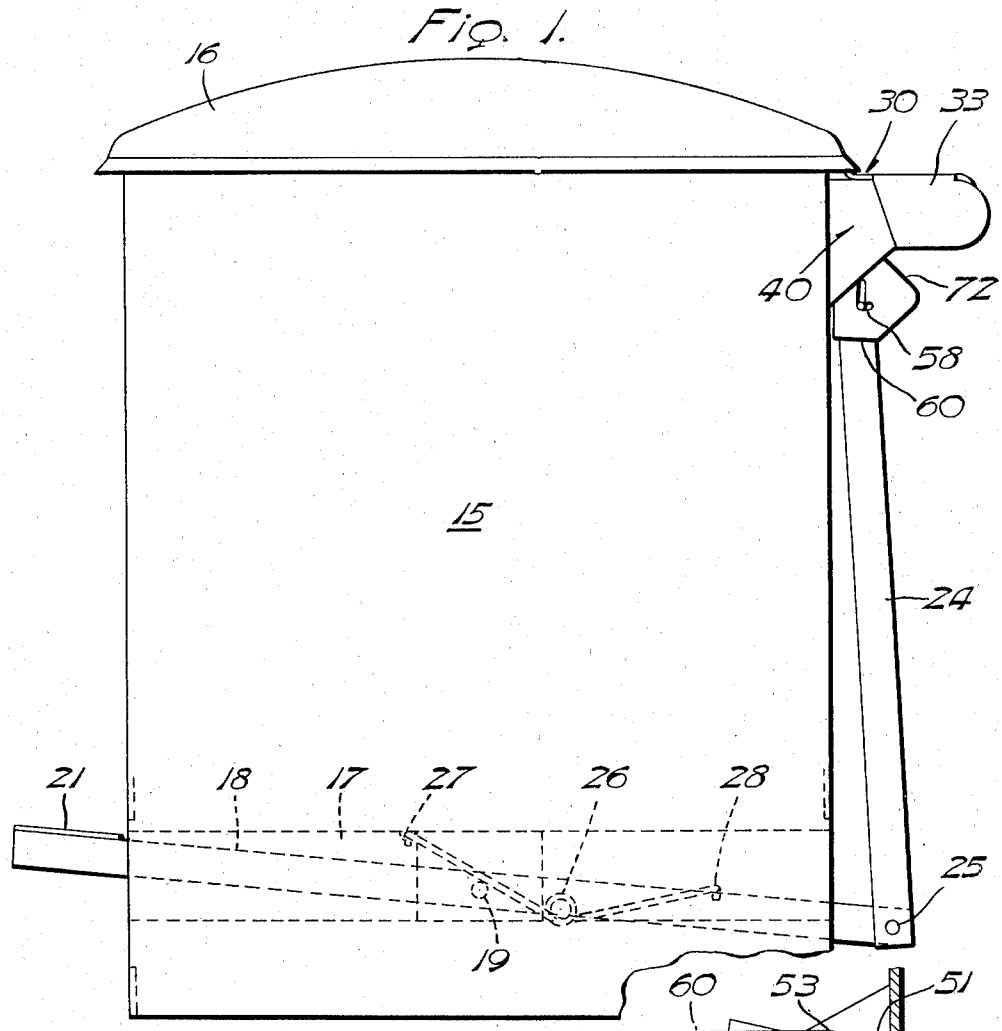
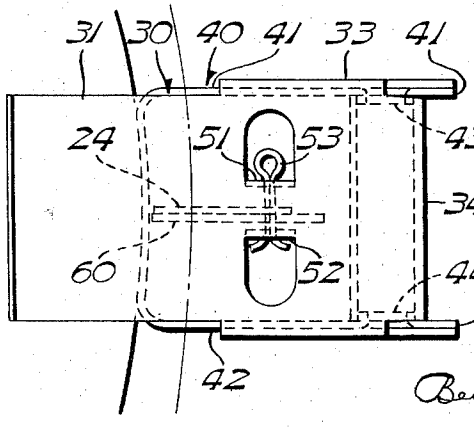


Fig. 6.



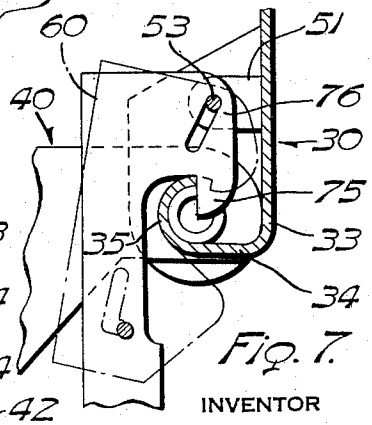


Fig. 7.

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Fig. 2.

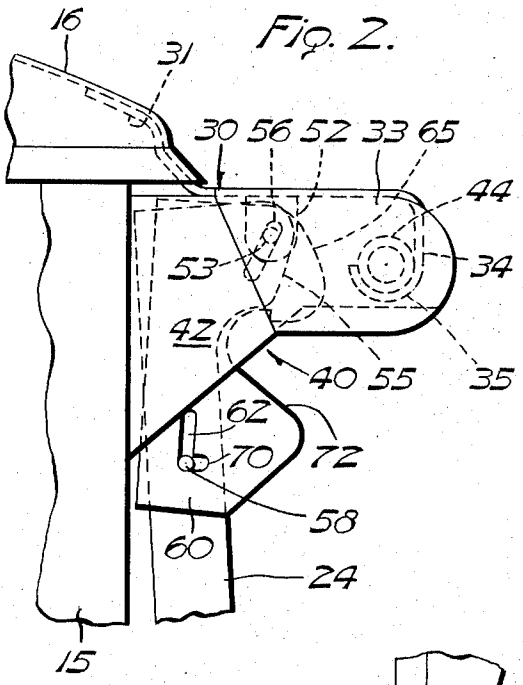


Fig. 3.

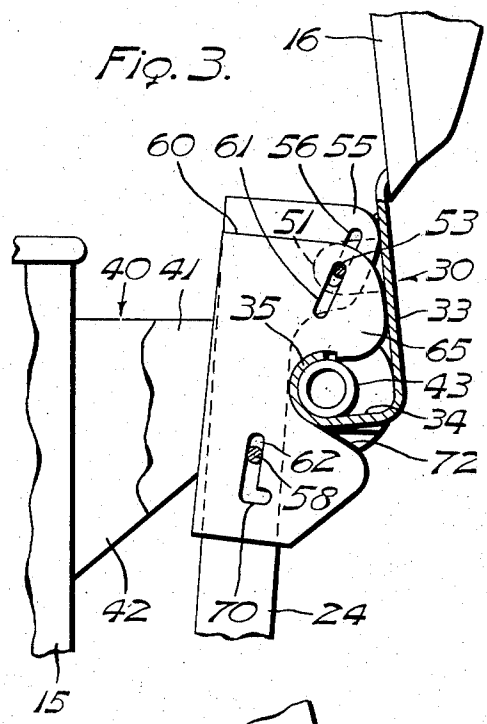


Fig. 4.

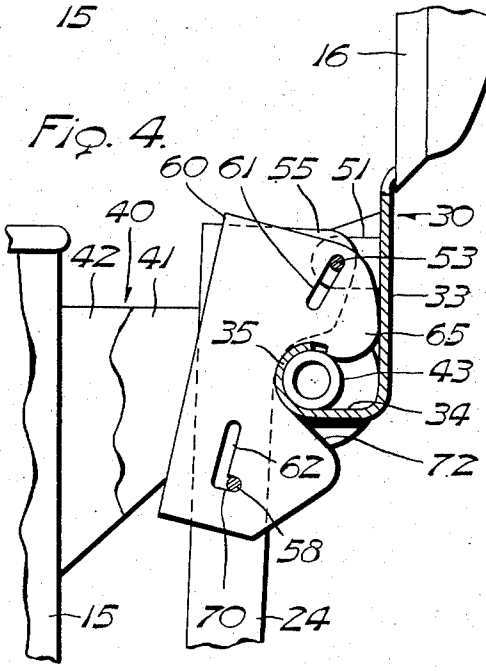
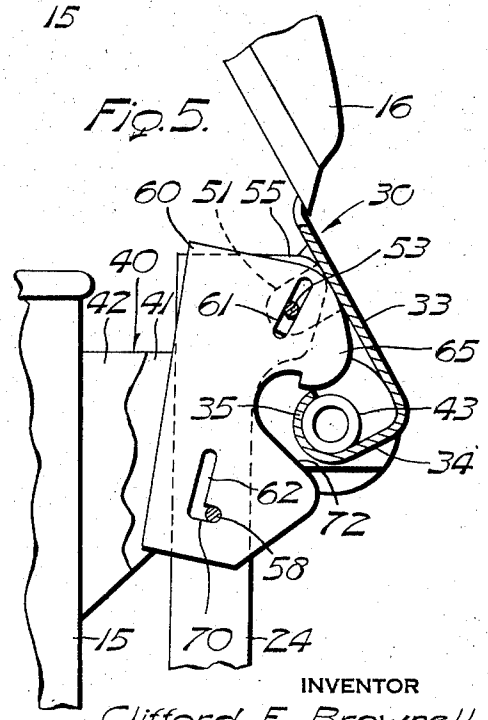


Fig. 5.



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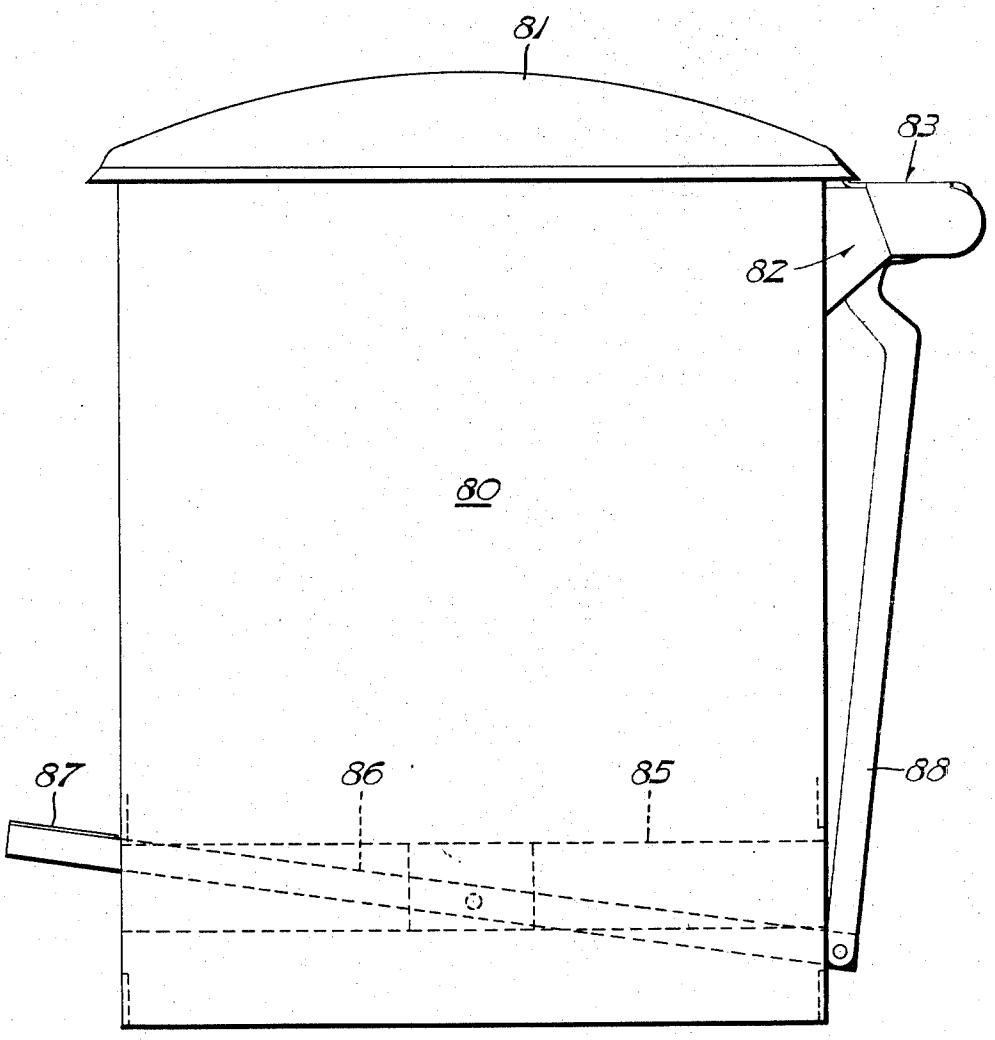
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Fig. 8.



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Fig. 9.

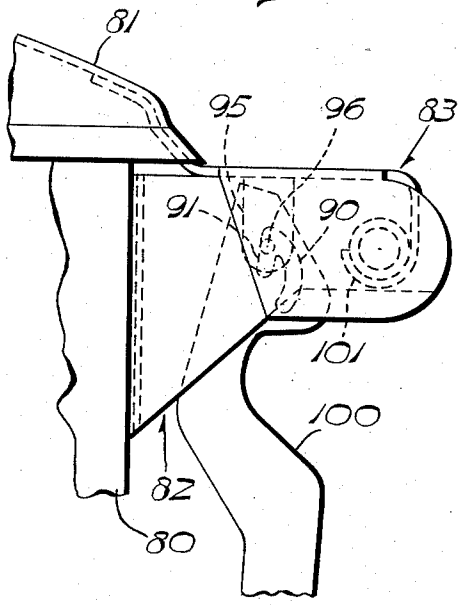


Fig. 10.

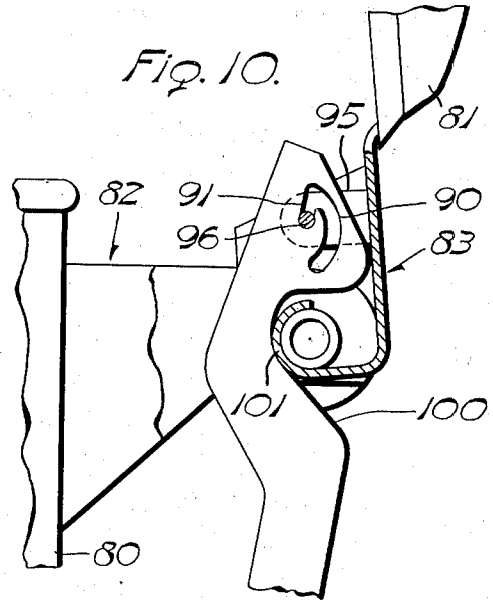


Fig. 11.

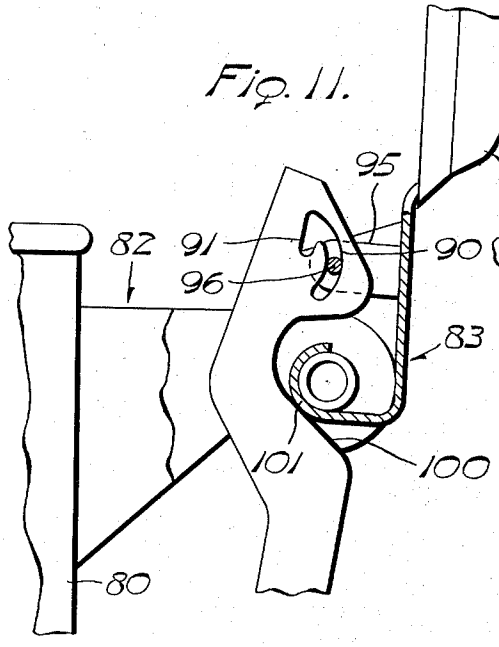
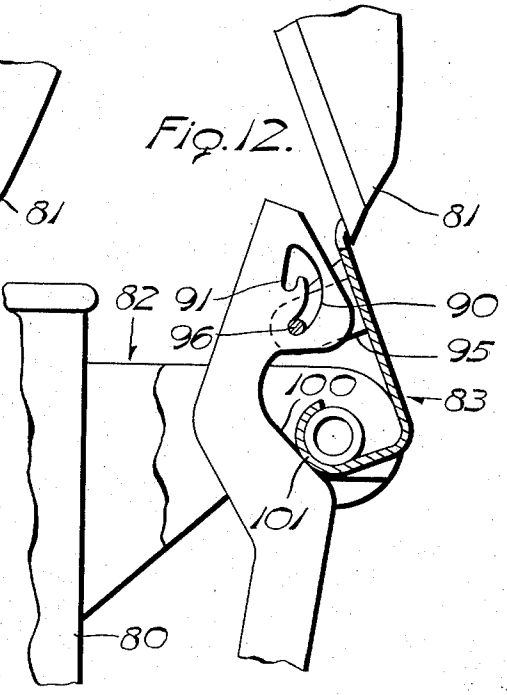


Fig. 12.



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Patented Aug. 7, 1951 2,563,456

UNITED STATES PATENT OFFICE

2,563,456

RECEPTACLE CLOSURE

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Application September 28, 1946, Serial No. 699,977

3 Claims. (Cl. 220—36)

1

This invention relates to receptacle closures and particularly to pedal mechanism for operating such closures.

Metal receptacles of the kind familiarly employed domestically in kitchens and the like for reception of garbage and other waste materials are conventionally provided with hinged cover elements or lids and have pedal means whereby the cover may be raised and lowered by foot operation. Devices of this kind in the prior art usually operate in such manner that foot pressure raises the cover or lid and removal of foot pressure permits the lid to close. In prior art devices of this class no provision is made for retaining the lid in an open position and this can be done only by manually grasping the open lid or by maintaining foot pressure on the operating pedal.

According to the present invention, means are provided whereby foot pedal depression opens the lid and the lid remains in open position when foot pedal pressure is removed. Further, arrangement is such that a subsequent depression of the pedal with the lid in open position causes the lid to be closed. In this way the lid may, whenever desired, be maintained in open position without any special manipulation and without the necessity for retaining foot pedal pressure.

Whenever the two-stage pedal operation is not desired, the pedal may be used to operate the lid in conventional manner without retaining the cover in open position by merely restraining the degree of pedal depression to a less amount than that required to move the cover to opened retained position.

Conventional receptacles of the class here under consideration are cylindrical and therefore lid operating pedal mechanisms must adapt themselves to such constructions. In any event, space limitations are such that preferred pedal mechanisms comprise a lever extending from front to rear of the device beneath the usable receptacle space, with an operating pedal at the front end of the lever and a vertically disposed link extending from the rear end of the lever to the lid hinge structure. By disposing such single vertical link exteriorly of the confines of the receptacle, a simple and practical construction is achieved.

Several novel mechanisms for accomplishing the aims of the present invention are set forth in the following specification and are illustrated in the accompanying drawings by way of example, but it is to be understood that the scope of the present invention is not limited thereto or otherwise than as defined in the appended claims. Various mechanical modifications and adaptations of the illustrated mechanisms will occur to those skilled in the art, within the scope of the present invention.

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In the drawings:

Fig. 1 is an elevational view of one form of receptacle embodying the principles of the present invention;

Fig. 2 is a fragmentary view on an enlarged scale of the hinge portion of the receptacle of Fig. 1 viewed in the same manner as Fig. 1;

Fig. 3 is a view similar to Fig. 2, but with portions of the hinge structure broken away and with the parts in another position of operation;

Fig. 4 is a view similar to Fig. 3, but showing a still further position of operation;

Fig. 5 is a view similar to Figs. 3 and 4 showing still another position of operation;

Fig. 6 is a top plan view of the hinge structure viewed in the position of Figs. 1 and 2;

Fig. 7 is a view similar to Fig. 4 but showing a modified form of the operating link thereof;

Fig. 8 is an elevational view of a receptacle having another form of lid operating mechanism embodying the principles of the present invention;

Fig. 9 is a fragmentary enlarged elevational view of the hinge structure of the receptacle of Fig. 8 viewed as in Fig. 8;

Fig. 10 is a view similar to Fig. 9, but with portions of the hinge structure broken away and the parts in another position of operation;

Fig. 11 is a view similar to Fig. 10 but in still another position of operation; and

Fig. 12 is a view similar to Figs. 10 and 11 with the parts in a still further position of operation.

Throughout the several figures of the drawings like characters of reference denote like parts and the numeral 15 designates a cylindrical casing having a lid or cover 16 disposable thereon. Devices of this class are conventionally provided with an inner removable receptacle (not shown) and consequently the casing 15 comprises merely a bottomless hollow cylinder. A horizontal bar 17 may extend diametrically across the interior of casing 15, being secured thereto at its opposite ends by welding or the like. In practice the inner receptacle, which usually comprises a pail, may rest on rail 17 and be supported thereby.

Rail 17 also provides a convenient fulcrum for an operating lever 18 which is pivoted thereto as at 19 and projects from the forward side of the casing 15 where it terminates in an operating pedal 21. Lever 18 also projects at the rear of the casing 15 where it is pivoted to a generally upright link 24 as at 25. Lever 18 is normally biased to the elevated position illustrated in Fig. 1 by means of a torsion spring 26 which has one of its ends anchored to rail 17 as at 27 and its other end acting against lever 18 as at 28, tending to rotate the lever in a clockwise direction as viewed in Fig. 1.

Lid 16 has fixed to its rear portion a hinge element 30 as by means of a flange 31 formed

on the hinge element and welded or otherwise fixed to the interior of lid 16, as appears clearly from Fig. 2. Hinge element 30 further comprises an inverted U-shaped portion 33 and an end flange 34 which terminates in a semi-circular curl 35.

A cooperating hinge element 40 is fixed to the outside of casing 15 and includes a pair of spaced parallel flanges 41 and 42. The flanges 41 and 42 are provided with inwardly formed bosses 43 and 44 upon which the curl 35 bears concentrically. The outer edges of flanges 41 and 42 are arcuate concentrically with the axis of bosses 43 and 44 and curl 35 and the inner surface of the web of channel portion 33 of the movable hinge element 30 rides against the arcuate portions of flanges 41 and 42, thus cooperating with curl 35 and confining hinge element 30 and lid 16 to purely pivotal movement in all normal operating positions of the mechanism.

The manner in which hinge elements 30 and 31 are assembled is of no concern here and forms the subject of my co-pending application of even date herewith.

A pair of flanges 51 and 52 may be struck from the web of channel portion 33 of movable hinge element 30 and a cotter pin 53 or other convenient means for providing a pivot fulcrum extends through flanges 51 and 52. The upper end of link 24 is enlarged to provide a rounded nose portion as at 55 and provided with a slot 56 through which cotter pin 53 passes. Slot 56 appears best in Fig. 3. At a point somewhat below slot 56 link 24 is provided with a fixed laterally projecting pin 58.

The numeral 60 designates a cam plate which is disposed adjacent the upper end of link 24 and has upper and lower slots 61 and 62, the former engaging over cotter pin 53 and the latter for receiving pin 58 of link 24. When the lid 16 is closed as in Fig. 2, cotter pin 53 rests in the upper end of slot 61 of cam plate 60, just as it does in Figs. 3 and 4.

Beginning with the parts in the position illustrated in Fig. 2, depression of the treadle 21 by a user causes lid 16 to open by pivotal movement about the bosses 43 and 44. This movement is produced by engagement of the upper end of link 24 against the under side of the web of channel portion 33 of hinge element 30. This pedal pressure and consequent upward movement of link 24 moves lid 16 and its hinge element 30 to the position illustrated in Fig. 3. During this movement, cam plate 60 moves upwardly but to a lesser degree than the upward movement of link 24, cam plate 60 being moved upwardly only by engagement of cotter pin 53 against the upper end of slot 61.

This relative movement causes pin 58 of link 24 to ride upwardly in slot 62 of cam plate 60 to the position illustrated in Fig. 3, and the arcuate movement of cotter pin 53 about the axis of bosses 43 and 44 during this phase of the operation moves an upper nose portion 65 of cam plate 60 over hinge curl 35 as shown in Fig. 3. At this point, lid 16 and its hinge element 30 are approaching their upper dead-center position. At this time lever 18 has reached its limit of counterclockwise movement, and the operator will naturally remove his foot from treadle 21 whereupon spring 26 urges the treadle 21 to raised position and moves link 24 downward.

Cam plate 60 cannot accompany link 24 in this downward movement by reason of the engagement of nose 65 thereof over hinge curl 35. Because of the relative angularity of slots 61 and 62 of cam plate 60, downward movement of link 24 from the position of Fig. 3, with cam plate 60 held against accompanying downward movement, causes cam plate 60 to be pivoted in a clockwise direction, such pivotal movement being generally about hinge curl 35 as a pivot axis, which projects nose 65 of cam plate 60 against the inner face of the web of channel portion 33 of hinge element 30 and moves lid 16 over center to fully opened position as shown in Fig. 4. This pivotal movement causes pin 58 of link 24 to enter a lateral extension 70 of slot 62 of cam plate 60, as shown clearly in Fig. 4. This engagement of pin 58 in the extension 70 of slot 62 locks lid 16 in open position.

When it is desired to again close lid 16, a second depression of operating pedal 21 again raises link 24, cam plate 60 being now raised therewith by reason of the engagement of pin 58 in slot extension 70. During this movement a cam surface 72 formed on cam plate 60 abuts hinge curl 35 and causes the upper end of link 24 and cam plate 60 to move to the left as a unit, as viewed in Fig. 4. This exerts a counterclockwise pull upon cotter pin 53 which pivots lid 16 toward closed portion. Fig. 5 shows the position of the parts when treadle 21 is again fully depressed, and at this point the operator will naturally remove his foot from the pedal which permits the cover to fully close.

As pedal 21 raises during this phase of the operation, and link 24 lowers, the parts move from the position of Fig. 5 to the position of Fig. 2. Toward the end of this movement, the lower left-hand corner of cam plate 60, as viewed in Figs. 2 through 5 engages against the side wall of casing 15, which pivots cam plate 60 sufficiently to free pin 58 from engagement in lateral extension 70 of slot 62, whereupon the mechanism is again in the position illustrated in Fig. 2 for a subsequent lid opening operation.

Fig. 7 shows a modification of the upper end of link 24 which comprises a substantial downward extension 75 of a nose 76 which otherwise corresponds in function to the nose 55 of link 24.

Having in mind that the construction of Fig. 7 includes an identical cam plate 60 and identical hinge elements 30 and 40, the only difference being in the presence of downward extension 75, when the rapidly moving cover is thrown to its fully open position with pressure removed from pedal 21, the downward extension 75 engages securely over hinge curl 35 and locks the cover more securely in open position.

The modification illustrated in Figs. 8 through 12 will now be described. The general operation of the mechanism of Figs. 8 through 12 is similar to that of the first-described embodiment. This embodiment comprises a hollow cylindrical casing 80 and a lid or cover element 81, the former having fixed thereto a hinge element 82 and the latter having fixed thereto a cooperating hinge element 83. The hinge elements 82 and 83 may be identical with the hinge elements 40 and 30, respectively, of the first-described embodiment.

Referring to Fig. 8, a rigid cross bar 85 fixed in casing 80 supports an operating lever 86 which includes a pedal portion 87 at one end and a pivotal connection with an operating link 88 at its opposite end. In this form, the force of gravity acting upon the parts sufficiently biases the mechanism to pedal-raised position without the need for spring means.

The upper end of link 88 has an arcuate slot 90

which terminates at its upper end in a downward extension 91. Like hinge element 30 of the first-described embodiment, hinge element 83 has a pair of down-turned ears 95 which form bearings for a pivot pin 96 which may be in the form of a cotter pin as previously described. The upper end of link 88 is disposed between the ears 95, and the slot 90 therein receives pivot pin 96. Below slot 90 link 88 is provided with a cam surface 100 which is engageable against a hinge curl 101, similar to the hinge curl 35 of the preceding embodiment, in a manner which will appear from a description of the operation.

The force of gravity normally biases the upper end of link 88 to the right as viewed in Figs. 8 through 12, so that pin 96 is normally above the downward extension 91 of slot 90 when the parts are in the lid-closed position illustrated in Fig. 9, wherein pedal 87 is fully raised. When foot pressure is applied to pedal 87, link 88 raises and the slot extension 91 engages pivot pin 96 and raises lid 81 to the position illustrated in Fig. 10 when further continuous pedal depression is arrested by engagement of cam surface 100 against hinge curl 101. The natural tendency, since further depression is not possible, is to remove pressure from the pedal 87. When the parts have reached the position of Fig. 10, lid 81 and hinge 83 thereof have passed their dead-center position so that release of pedal pressure, which permits link 88 to drop and thus release pivot pin 96 from slot extension 91, permits lid 81 to fall to a more open position as illustrated in Fig. 11.

It will be noted that in this movement from the position of Fig. 10 to the position of Fig. 11, link 88 lowers only momentarily until pivot pin 96 is in the upper end of slot 90, whereupon the further opening movement of lid 81 actually again raises link 88 until further raised movement is arrested by a second engagement of cam surface 100 against hinge curl 101 as shown in Fig. 11. At this time lid 81 is in its fully opened position. However, since pivot pin 96 is now freed from slot extension 91, it is now possible to apply additional pedal pressure and further raise link 88, to thus effect closing of lid 81.

When such closing pedal pressure is applied, cam surface 100, during raising movement of link 88 cams against hinge curl 101 and thus forces the upper end of link 88 to the left and, by reason of the engagement between pivot pin 96 and slot 90, rotates the lid in a counter-clockwise direction toward closed position. When the pedal has reached its fully depressed position, the hinge parts and link 88 will have reached the position illustrated in Fig. 12, wherein link 81 has returned back past dead-center and will be fully closed by gravity upon release of pedal 87, the parts automatically returning to the position illustrated in Fig. 9.

What is claimed is:

1. A receptacle and a cover therefor, each having co-operating hinge formations adjacent an edge of said cover, said cover having pivot means eccentric with respect to said hinge formations and inwardly thereof relative to said cover, an upright link having a slot adjacent its upper end for engagement with said pivot means, said link being operable by upward movement thereof to move said cover to gravity-retained full-open position, said link having cam means projecting outwardly from one side thereof carried thereby and engageable against one of said hinge formations when the cover is in raised position, whereby a subsequent upward movement of said link cams the upper end thereof laterally whereby its slot acts against said eccentric pivot means to cause the cover to be swung toward closed position.

2. A receptacle and a cover therefor, each having a cooperating hinge formation adjacent an edge of said cover for pivotal movement of said cover between open and closed positions, cover operating means comprising a vertically movable link, said cover means having an eccentric pin and said link having a pair of connecting downwardly diverging slots for receiving said pin, the slot nearest the receptacle being positioned to engage said pin and raise said cover upon upward movement of said link, said cover being arranged to fall over center to full-open position upon release of said link and thereby move the eccentric pin into the other of said slots, said link having an inclined cam formation engageable against a relatively fixed portion of the hinge structure when the eccentric pin is in said other slot whereby subsequent raising of said link causes the cam formation to move the link laterally toward the receptacle and thereby cause said other slot to act laterally against said pin and move said cover toward closed position.

3. A receptacle and a cover therefor, each having a cooperating hinge formation adjacent an edge of said cover for pivotal movement of said cover between open and closed positions, a pin on said cover disposed inwardly of said hinge connection when the cover is closed, cover operating means comprising a vertically movable link having a slot engaging said cover pin, a cam plate likewise having a slot connection engaging said cover pin, the slots in said link and said cam plate being generally upright to provide a vertical play connection therebetween, a second pin and slot connection between said link and said cam plate spaced from the beforementioned pin and slot connections, the slot of said second pin and slot connection being disposed to cause relative lateral movement of the cam plate upon downward movement of the link relative to the cam plate, said cam plate having an outwardly projecting cam surface for engagement against one of said hinge formations upon said lateral movement of the cam plate, means on the cam plate and engageable with the hinge formations for retaining the cam plate in elevated position when the cover is raised and the link moves downwardly, whereby an initial upward movement of said link opens said cover by abutment thereagainst of said link and said cam plate and a subsequent upward movement of said link closes said cover by engagement of said cam surface against said hinge formation.

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