April 25, 1967 H. H. DUBO 3,315,828

RESILIENT CLOSURE LATCH FOR CONTAINERS

Filed Dec. 31, 1964 2 Sheets-Sheet 1

FIG. 1

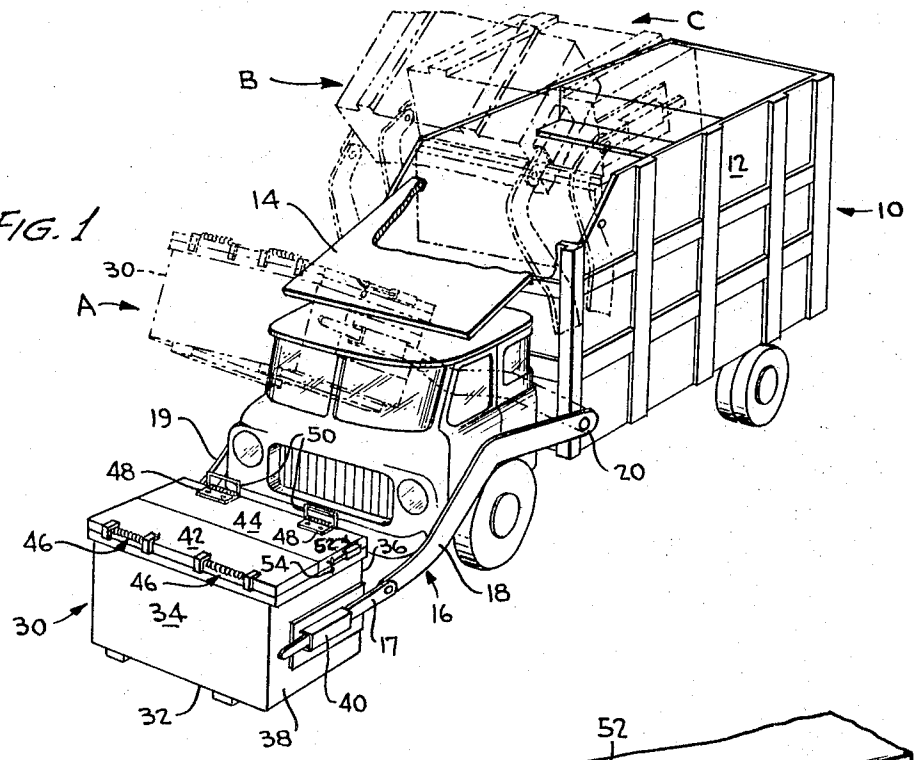
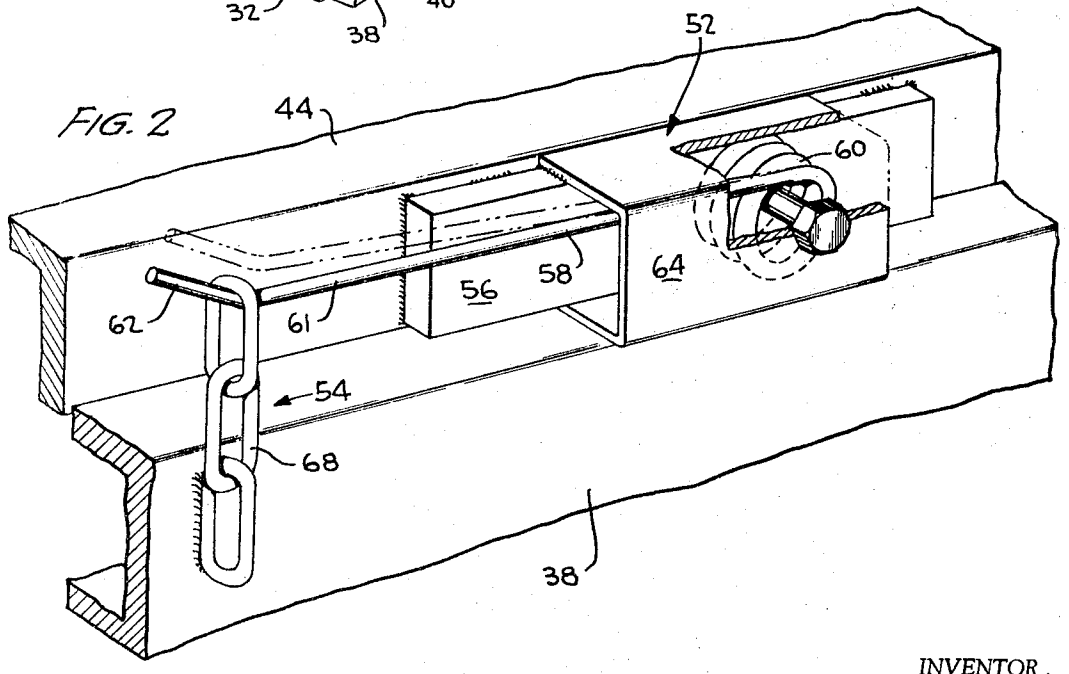


FIG. 2



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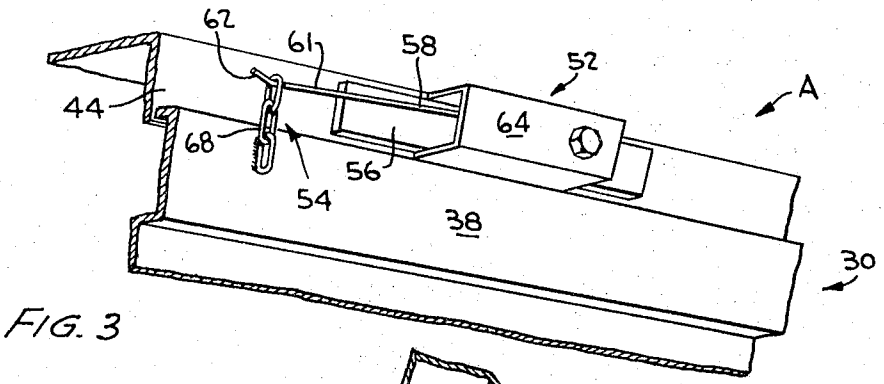


FIG. 3

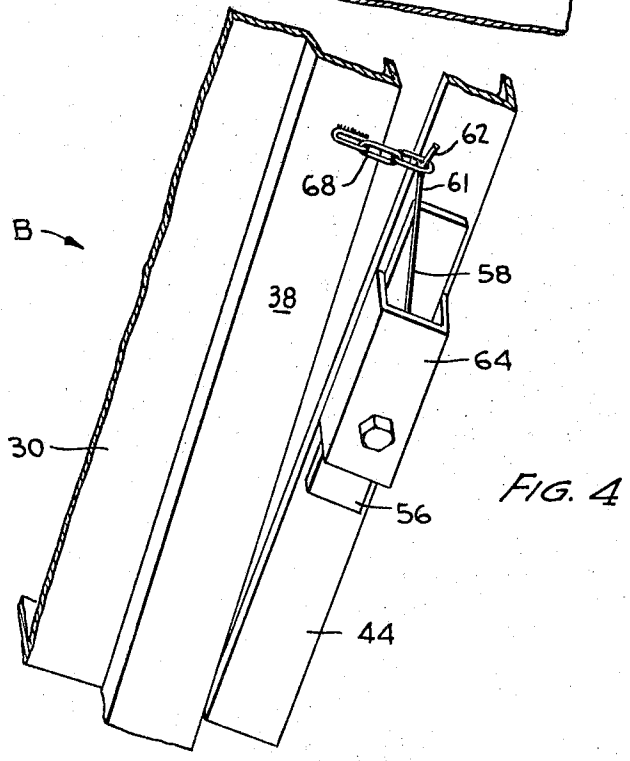


FIG. 4

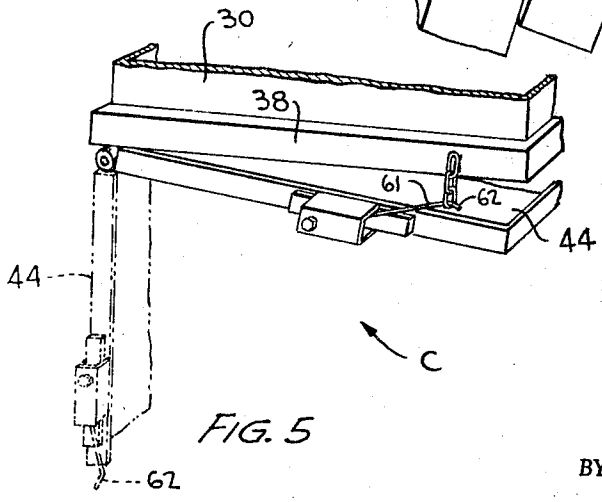


FIG. 5

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RESILIENT CLOSURE LATCH FOR CONTAINERS

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6 Claims. (Cl. 214—302)

This invention relates generally to refuse containers suitable for use with self-loading vehicles of the front loader type, and more particularly to an improved releasable latch means for the closures of such refuse containers.

Such refuse containers are usually placed near a store, for example, in locations accessible to a vehicle of the type mentioned. The containers are filled with refuse, such as garbage, paper, etc., and are accordingly equipped with suitable latched covers to confine odors and refuse therein. The provision of such covers generally requires prior unlatching of the covers to permit dumping the contents within the body of the collection vehicle, i.e., by inverting the container over an opening in the vehicle body. This gives rise to the problem of the covers opening prematurely, during dumping, under the influence of the contents of the container, strong winds, gravity, etc.

It is desirable, of course, that all the refuse discharging from the container be collected within the vehicle body. However, when the container cover opens prematurely, the material falling from the container into the vehicle body is oftentimes scattered by a breeze or strong wind. Very light material may even drift away without the influence of a breeze. The inadvertent scattering of refuse in such a manner is, of course, highly undesirable.

Various attempts have been made to overcome this problem by providing cumbersome shielding screens to confine the refuse discharging from the inverted container and providing other cover-securing means integral with the container lifting and dumping arms. The known means for overcoming these problems although satisfactory to a degree, at times are lacking in certain respects.

A primary object of this invention is to overcome the shortcomings of the prior art and to provide an improved structure for refuse containers utilized by load-collecting vehicles.

Another object of this invention is to provide an improved closure latching means for refuse containers.

Still another object of this invention is to provide a closure latch which will prevent premature opening of the closures of a refuse container during collection by a self-loading vehicle and which will be self-releasing when the refuse container is in an optimum position for unloading.

Still a further object of this invention is to provide a novel closure latch means which is readily installed and operated, and which is practical and satisfactory for the purpose intended.

These together with other and more specific objects and advantages will become apparent from the following description taken in conjunction with the drawing forming a part thereof, wherein:

FIGURE 1 is a perspective of a front end self-loading vehicle shown lifting a refuse container embodying the present invention and further showing, in broken lines, the container in various stages of lifting and dumping;

FIGURE 2 is an enlarged fragmentary perspective of a portion of the refuse container shown in full lines in FIGURE 1, showing the cover latch means with a portion of the latch means broken away;

FIGURE 3 is a fragmentary perspective of the cover portion of the container of FIGURE 1 as shown in position A of FIGURE 1;

FIGURE 4 is a fragmentary perspective of a portion of the container of FIGURE 1 as shown in the partially inverted position B of FIGURE 1; and

FIGURE 5 is a fragmentary perspective of a portion of the container of FIGURE 1 as shown in the fully inverted position C of FIGURE 1, further showing the container closures in fully open position.

Referring now to the drawings in detail and first considering FIGURE 1, a self-loading refuse collection vehicle of the power-operated front end loading type is generally indicated at **10** and includes a refuse collection body **12**. The forward portion of the top of the body **12** is fitted with a closure panel **14**. The closure panel **14** pivots about a transverse vertical axis and is shown in the open position, thus providing an opening through which refuse may be discharged into the body **12**. Although a front end loading vehicle is shown for purposes of illustration, the use of other type vehicles is contemplated.

The front loading vehicle **10** further includes a power operated refuse container lifting and dumping means which is generally indicated in full lines at **16**. The lifting means includes a pair of main lifting arms generally indicated at **18** and **19** which are spaced apart transversely of the vehicle chassis. Arm **18** is pivotally secured to the vehicle **10** at the pivot point **20** and arm **19** is secured at a similar point, not shown, on the opposite side of the vehicle **10**. The lifting arm **18** includes an articulated container engaging portion **17**. The arm **19** is articulated in a similar manner. The lifting means **16** is operated by a suitable means such as hydraulic cylinders.

The conventional refuse collection vehicle **10** aids in illustrating the operations and advantages of this invention. The power operated lifting means **16** is shown engaged with a refuse container adapted for use with a front end loader and generally indicated at **30**. While any suitable form or type of container may be used, we have illustrated as an example thereof the container **30** which is provided with a body portion formed by a closed bottom **32**, upstanding front and rear walls **34** and **36**, and opposite end walls **38**. Container lifting-means including lifting pockets **40** are secured to the end walls **38** of the container **30**. The container **30** is fitted with closure panels **42** and **44**. The closure panels **42** and **44** are pivotally secured to the container by means of suitable hinges adjacent the upper edges of the front and rear walls **34** and **36**, as indicated generally at **46** and **48**. The closure panels **42** and **44** may be provided with balance springs mounted on the hinge bars to counterbalance the weight of the massive closure panels when manually loading the container with refuse. Bumper springs generally indicated at **50** may be provided on the side of the container toward the vehicle to arrest the closure panel in a substantially upright position during manual loading and also function to prevent the lid **44** from scraping against the vehicle windshield when the container is being rotated out of the truck body after dumping. Other types of closure panels (not shown) may be incorporated on the typical container shown.

A novel closure panel latching means indicated generally at **52** is secured by suitable means, such as welding, to the container closure **44** and cooperates with a keeper means indicated generally at **54** which is secured to the end wall **38** adjacent to the upper portion of the end wall.

In the positions "A," "B" and "C" of FIGURE 1, we see the container **30**, shown in broken lines, being lifted through portions of the dumping cycle. In position "A," the container is substantially horizontal, in position "B," the lifting arms have partially inverted the container but the novel latch means **52** of this invention has prevented the premature opening of the closure **44** for reasons which will become clear. In position "C," we see the container in the fully inverted position for discharging refuse into the vehicle body **12** wherein the latch means **52** has released the closure **44**, thus allowing the closure **44** to assume a vertical position. Although not shown,

the one or more of the closure panels may be equipped with a closure latch similar to latch **52**.

In FIGURE 2, it may be seen that the closure latch means **52** and its associated keeper means **54** include a rectangular support bar or channel member **56** which is secured to the edge of closure **44** by suitable means, such as welding or bolting, for example. The support **56** has mounted thereon a resilient latch means **58**. The resilient latch means **58** includes a helical spring or the like **60**, one end of which, not shown, is secured to support bar **56** to prevent undue rotational movement of the spring **60** about its longitudinal axis. The spring **60** may be secured to the bar **56** by any suitable means such as clamping or retention of the spring end within a recess or hole in the bar **56**. The helical spring **60** has a substantially straight arm portion **61** which terminates in a free end **62** which is bent upwardly adjacent its end, for reasons which will become clear. The free end **62** of the spring **60** is normally biased to the position indicated in broken lines in FIGURE 2. The spring **60** is further supported by and prevented from completely releasing its tension by a U-shaped cover member **64** which straddles and is longitudinally disposed along the support member **56** and a bolt **66** which passes through the cover member **64**, the helical spring **60**, and which bolt is secured to the support **56** by suitable means such as being threadably engaged, for example. Alternatively, the bolt **66** could be replaced by a pin which was integral with the cover **64** with the cover **64** having means to secure it along the portion contiguous with the support **56**.

The keeper means **54** can be flexible and includes a length of link chain **68**, for example, which is secured to the end wall **38** of the container **30** by suitable means such as welding, i.e., some relative movement must be provided between the keeper means and said arm portion **61**. The free end of the keeper chain **68** cooperates to engage the free end **62** of the arm of the spring **60**. The keeper chain **68** is so positioned with regard to the spring end **62** so that when the spring arm and the keeper are engaged, as shown in FIGURE 2, the arm **61** of the spring **60** is intermediate of the top and bottom of the cover member **64**. As the spring arm **58** approaches the fully depressed position, as shown by the arrow in FIGURE 2, the free end **62** is capable of slipping out from the keeper chain **68**. The full line position of FIGURE **2** is with the closure **44** secured and ready for lifting and dumping of the contents of the container **30** into the vehicle body **12**.

In operation, the container **30** embodying the present invention is prepared for lifting by manually depressing the spring arm **58** and securing it with the keeper chain **68**.

In FIGURE 3 a portion of the container **30** with the resilient latch means **52** and keeper means **54** mounted thereon is shown in the broken line position "A" of FIGURE 1. It may be noted that closure **44** is biased to a closed position by the combined action of the latch means and gravity.

As the container **30** is lifted from the position "A" of FIGURE 1 and 3 toward the position "B" of FIGURES 1 and 4, the closure **44** tends to be urged open by the weight of the contents and the action of gravity as the closure **44** passes over the dead vertical point. If the closure **44** were permitted to open at this point a considerable amount of refuse in container **30** might be scattered to either side of the vehicle body **12** by the wind, for example, rather than being deposited within the vehicle body **12**.

The closure **44**, however, is restrained from opening until the container is in the substantially inverted position "C" of FIGURES 1 and 5 by virtue of the fact that the resilient arm **61** remains engaged by the keeper chain **68** until the container **30** is substantially inverted and until such time as the arcuate travel of the closure **44** to the point shown in full lines in FIGURE 5. This permits the free end **62** of the spring **60** to disengage from the keeper chain **68** thereby permitting the closure **44** to assume the fully opened position shown in broken lines in FIGURE 5, thus fully discharging the contents of the container **30** into the interior of the vehicle body **12** without the undesirable scattering of refuse outside the vehicle body.

It is therefore seen that a container of the nature disclosed, embodying the present invention overcomes the undesirable functioning of containers heretofore known in a manner which is simple, inexpensive and efficient.

While a preferred form of the invention has been set forth, it is understood that variations may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed as new is as follows:

1. In a container including a body portion opening upwardly and having means for engagement with lift means whereby said container is normally supported in an upwardly-opening position when being loaded and is inverted to a downwardly opening position when raised and unloaded, said body portion including opposite side walls, at least one top closure panel pivotally secured to said container and overlying the upwardly opening container, top closure latch means on said container, said top closure latch means including releasable means securing said closure in sealing relation to said container when said container is in an upright position, said latch means including means for retaining said container closure in substantially sealing relationship to said container while said container is being inverted, said releasable means including means for releasing said container closure to permit said closure to fully open under the influence of gravity when said container reaches the substantially inverted dumping position, said releasable means including a spring, said spring having a first end and a second end, said first end having means securing said spring to a portion of said container, each second end of said spring terminating in a free end, means secured to another portion of said container releasably engaging said free end of said spring and permitting relative movement and separation therebetween.

2. The structure as claimed in claim **1** in which said spring comprises a torsion spring including an arm terminating in said free end.

3. The structure as claimed in claim **1** in which said means secured to another portion of said container comprises a link chain.

4. The structure as claimed in claim **3** in which said spring comprises a torsion spring including an arm terminating in said free end.

5. The structure as claimed in claim **1** in which said spring is mounted on an edge portion of said closure panel, and said means secured to another portion of said container is mounted on a wall portion of said container.

6. The structure as claimed in claim **5** in which a support bar is interposed between said edge portion of said closure panel and said spring, and a cover member secured to said edge portion of said closure member and overlying said first end of said spring.

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