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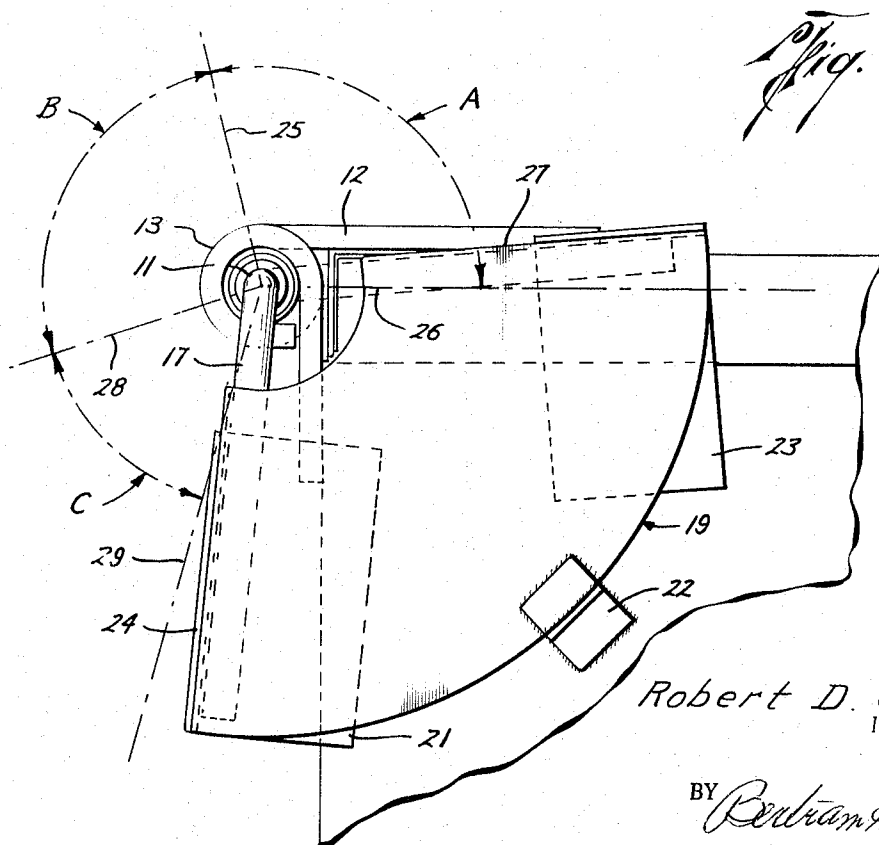
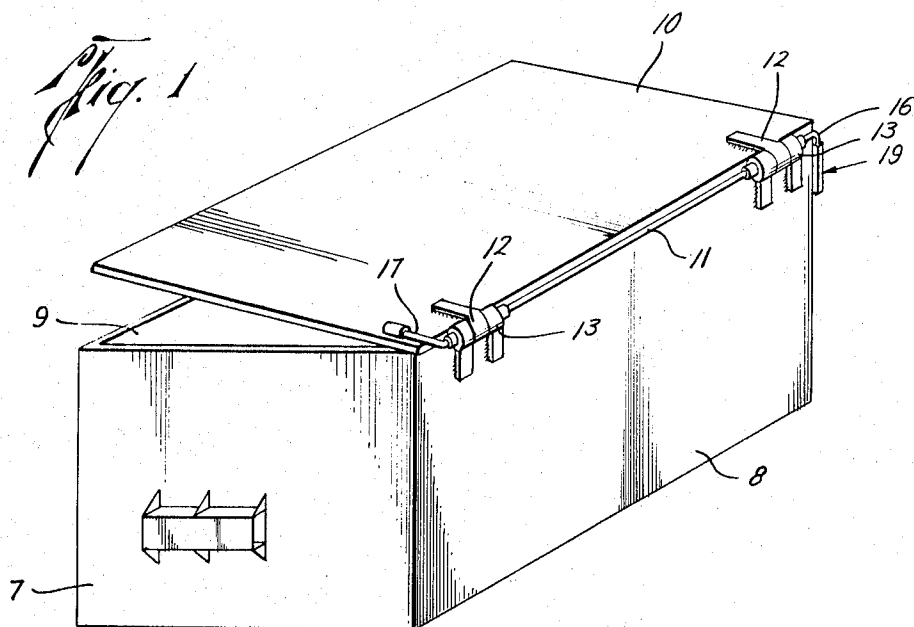
R. D. CAMPBELL

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LID CONTROL FOR HEAVY CONTAINERS

Filed July 9, 1964

2 Sheets-Sheet 1



Robert D. Campbell
INVENTOR

BY *Bertram H. Mann*
ATTORNEY

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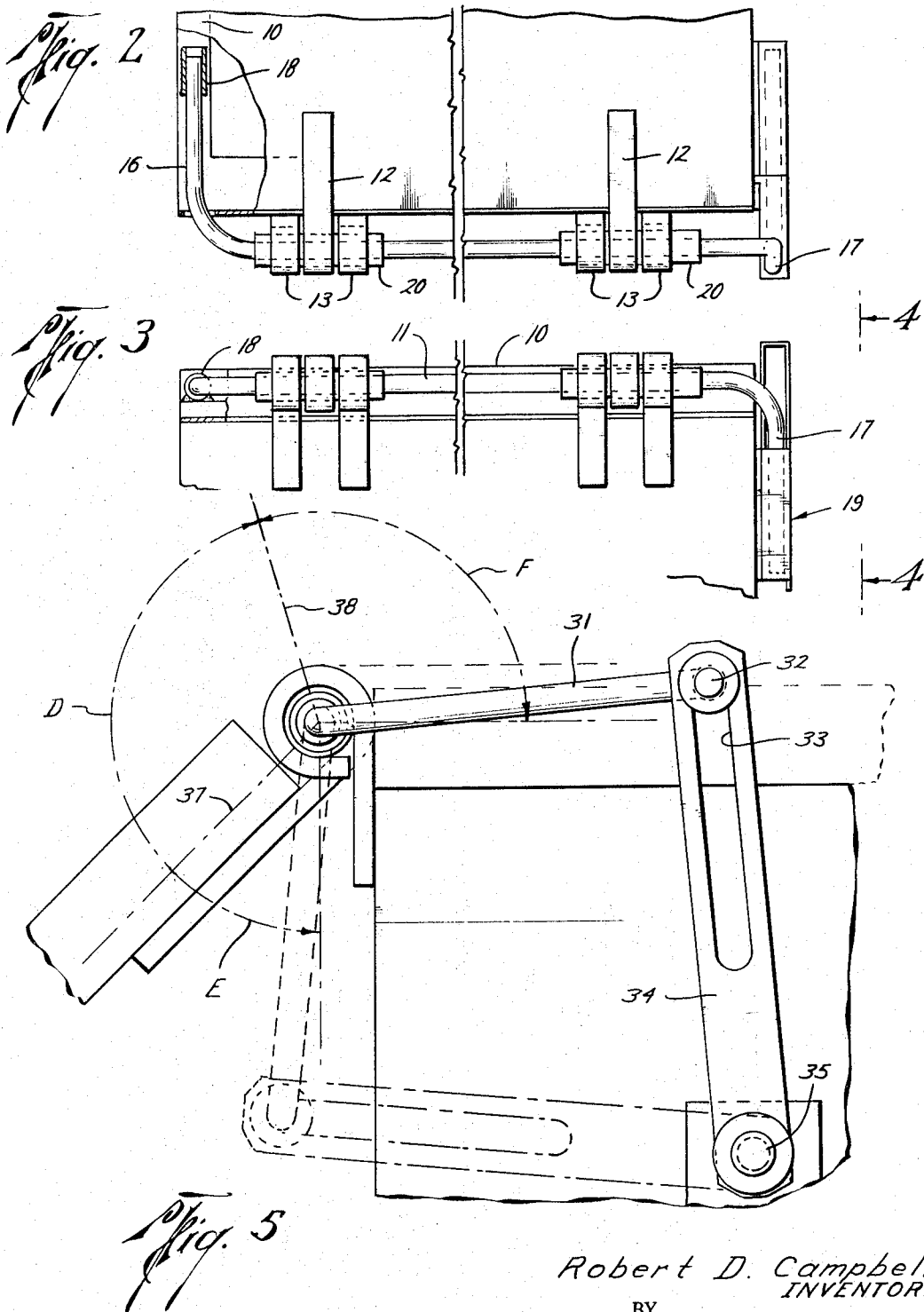
R. D. CAMPBELL

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Robert D. Campbell
INVENTOR

BY

Bertman H. Mann

ATTORNEY

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LID CONTROL FOR HEAVY CONTAINERS

Robert D. Campbell, Dallas, Tex., assignor, by mesne assignments, to Murray Company of Texas, Inc., a corporation of Delaware

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2 Claims. (Cl. 220-35)

This invention relates to large, heavy containers and consists particularly in novel control means for the lids or covers thereof.

The invention may be used advantageously in connection with the heavy metal containers of box-like construction now in common use in the refuse disposal industry. Such containers may have a volume of several cubic yards and are used for the deposit of refuse pending collection and disposal. Containers of somewhat similar construction are used for the storage of excelsior and other inflammable materials and for materials which must be protected against exposure to light, air, or other ambient conditions. In all of such applications, the large, heavy hinged cover or lid must be opened frequently. The weight of the lid may range from 40 to 100 pounds, and the effort required to raise such cover is an objectionable feature of these containers. This is especially true where the containers are so large that the lid is located above the level of the shoulders of a workman. Moreover, the lid, during opening, must either be supported in its open position by the workmen or permitted to drop heavily against the side of the container with the resultant straining and possible damaging of the parts.

Various attempts have been made to avoid these objectionable features such as by the use of lighter weight materials as aluminum, the use of counterweights and various spring arrangements to offset or counteract a portion of the weight of the top, and the installation of smaller trap doors within the main covers. The much higher cost of aluminum and its lack of strength compared to iron have proved to be deterrents to the use of lighter metals. Springs and counterweights and small trap doors have proven complicated, expensive, and generally unsatisfactory.

Accordingly, an object of the present invention is to provide a relatively cheap and dependable means of overcoming the objectionable features of heavy iron container lids, as described above.

Another object is to provide novel means for breaking the fall of a heavy container lid into fully closed or fully-opened position.

Another object is to provide means for assisting in lifting of such a lid from its closed or open position.

In accordance with the present invention, a torsion bar extends along the hinged edge of the lid coaxially with the hinge and has its ends provided with right angle cranks which are connected, respectively, to the lid and to the container wall. The offset ends of the torsion bar are so disposed that the bar will be unstressed when the lid is in a partially opened position. The torsion bar will be twisted as the lid as either further closed or further opened from this neutral position so as to resist the fall of the lid. Since the torsion bar will be stressed in the fully open or fully closed positions of the lid, its torsional force will tend to assist in the lifting of the lid away from such position. If desired, the resilience and twist of the torsion bar may be such as to itself initiate the opening of the lid so that a suitable latching device will be required to hold the lid fully closed, fully opened, or both.

In the accompanying drawings which illustrate the invention:

FIG. 1 is a perspective view of a heavy metal container of the type described and having a lid control in accordance with the present invention;

FIG. 2 is an enlarged, partial top view of the container, portions being broken away to show the underlying structure;

FIG. 3 is a side view of the parts in FIG. 2;

FIG. 4 is an enlarged right-end view showing the structure in FIGS. 2 and 3; and

FIG. 5 is a view similar to FIG. 4 but showing a modification.

FIG. 1 shows a rectangular container having end walls 7, side walls 8 and 9, and a hinged lid 10. Extending along the hinged edge of the lid is a torsion bar 11 which, in this instance, extends rotatably through hinge eyes 12 secured to the lid and 13 secured to the container side wall. However, if desired, the lid may be hinged to the container body independently of the torsion bar which would then extend adjacent the hinges.

The torsion bar 11 has angularly disposed end parts 16 and 17, the former extending along the lid or cover 10 and being firmly secured thereto by a bracket 18 which may be in the form of a sleeve secured to the extreme end of the bar and welded to the metal of the lid framing. The other angular end 17 of the torsion bar is received within a bracket generally designated 19 to be further described hereafter. Intermediately of the angled ends 16 and 17, bar 11 is provided with spaced wear sleeves 20 which are rotatably received in hinge eyes 12 and 13 previously mentioned. Additional hinges may be provided along the torsion bar if necessary.

Bracket 19 is secured to the end wall of the container as by clips 21, 22, and 23. The relationship of angled ends 16 and 17 is such that in the fully closed position of lid 10, bar end element 17 is lodged firmly against end wall 24 at the extreme left edge of bracket 19 (FIG. 4). In this position, the intermediate portion of the torsion bar will be torsionally stressed a substantial amount, which is represented by the arc A extending from the center line position 25 of the lid, just as end element 17 engages bracket end wall 24 and horizontal line 26 paralleling the center line of the lid in its closed position. The upper edge wall 27 of bracket 19 is in such position that it is just engaged by bar end element 17 when the lid reaches the position as indicated by center line 28, the unimpeded travel of end element 17 through the bracket being represented by the arc B. Thereafter, during continued fall of the lid towards the container side wall, the torsion bar will be oppositely stressed, as represented by the arc C between center line 28 and depending line 29, the latter representing the fully opened position of the lid. Thus, in both the fully closed and fully opened positions of the lid, the torsion bar will be under torsional stress so as to tend to lift the lid.

The modification shown in FIG. 5 is generally similar. However, in this instance, the right hand angled end 31 of the torsion bar has an extremity 32 slidably received in a longitudinal slot 33 in a link 34 which is pivoted at 35 to the end wall of the container. Lever 34 is shown in solid lines in the position it assumes when the cover is fully opened. The lever is also shown in dot and dash lines at its opposite extreme of movement which corresponds to the fully closed position of the cover. The arrangement of the linkage is such that the free oscillation of angled end portion 31 of the torsion bar is limited to the range indicated by the arc D. The extremity 32 of the bar reaches the upper end of slot 33 when the cover is approximately in the position represented by the center line 37. During the remainder of the opening movement of the cover, as represented by the arc E, the torsion bar will be placed under twisting stress. During closing of the cover, the extremity 32 of the torsion bar will reach the outer end of slot 33 when the cover is in the position represented by the dot and dash center line 38; and the remainder of the closing movement, as represented by the

arc F, will be resisted by the torsional resilience of the torsion bar.

Where the angled ends of the torsion bar are the same lengths, there will be no mechanical advantage between the cover and torsion bar. However, a mechanical advantage may be built into the connection between the torsion bar and cover, as by varying the lengths of the crank arms at the ends of the torsion bar or by other suitable means. If desired, more than one torsion bar may be provided, and these may be arranged symmetrically with respect to the cover. The torsion bar will be of such size and material as to withstand the torsional stressing as required without permanent deformation and the degree of twist, as determined by size of bracket 19 in the first form and the design of the linkage in the second form, will be adjusted accordingly. The arc of inaction B or D may be varied in extent or entirely eliminated. The invention may be modified in these and other respects as will occur to those skilled in the art, and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A container having a box-like body and a heavy lid, hinge means movably securing an edge of said lid to the container body along one edge thereof, a torsion bar extending along said edges and having offset ends, one of said ends being secured to said cover and the other extending along a wall of said body, said hinge means comprising hinge eyes projecting, respectively, from the juxtaposed edges of said body and cover and rotatably embracing said torsion bar which thereby serves as the hinge pin, and lost motion means securing said last-mentioned bar end to said wall for providing a range of opening and closing movements of said cover unimpeded by said bar while causing said bar to torsionally resist at

least the terminal portions of the opening and closing movements of said cover.

2. A container having a box-like body and a heavy lid, hinge means movably securing an edge of said lid to the container body along one edge thereof, a torsion bar extending along said edges and having offset ends, one of said ends being secured to said cover and the other extending along a wall of said body, and lost motion means securing said last-mentioned bar end to said wall for providing a range of opening and closing movements of said cover unimpeded by said bar while causing said bar to torsionally resist at least the terminal portions of the opening and closing movements of said cover, said lost motion means comprising a lever pivoted to the wall of said body and having a longitudinal slot, said last-mentioned bar end being slidably secured in said slot and limited thereby in its oscillatory movements.

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THERON E. CONDON, *Primary Examiner*.

JAMES R. GARRETT, *Examiner*.