

April 28, 1964

G. GUNN, JR
SHIPPING CONTAINER

3,130,855

Filed Dec. 8, 1960

2 Sheets-Sheet 1

Fig. 1.

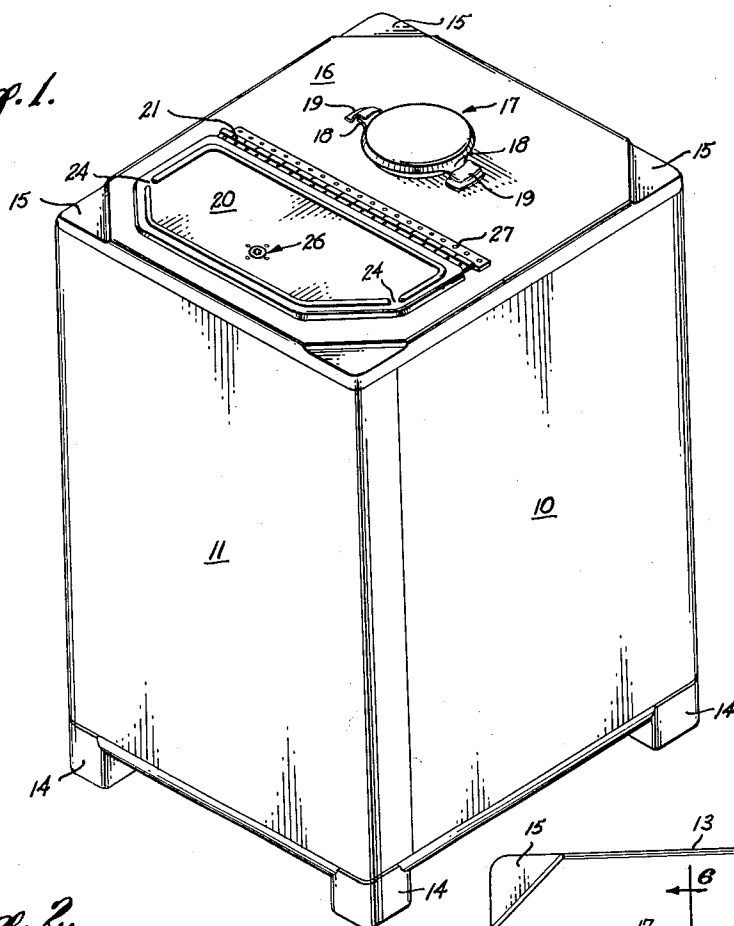


Fig. 2.

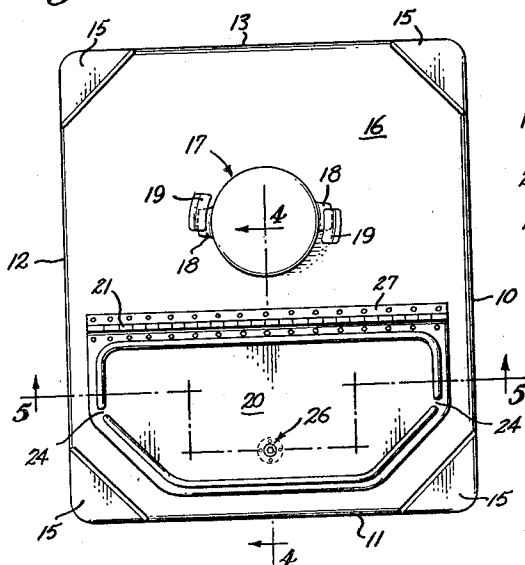
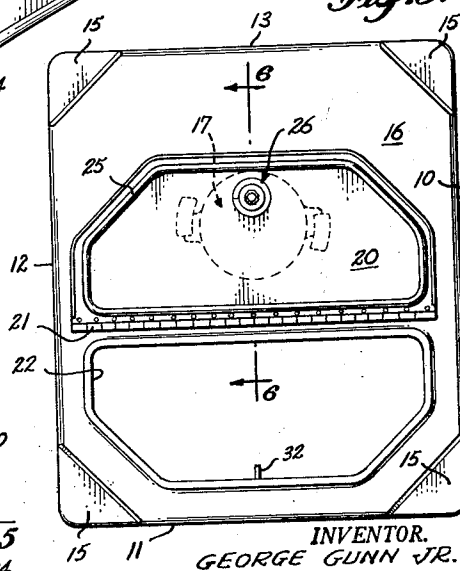


Fig. 3.



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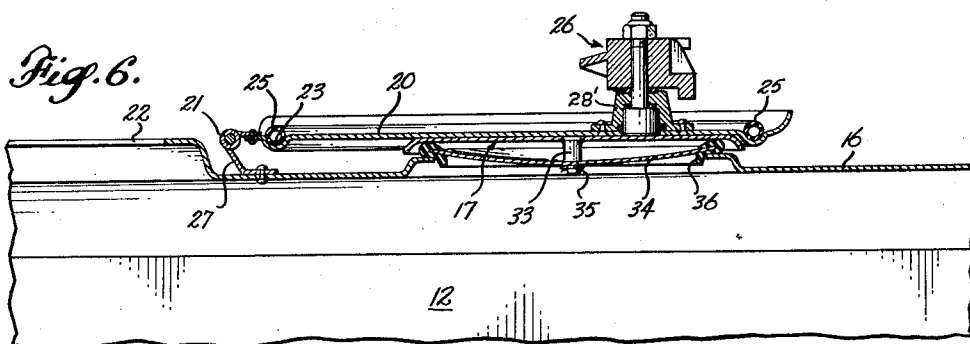
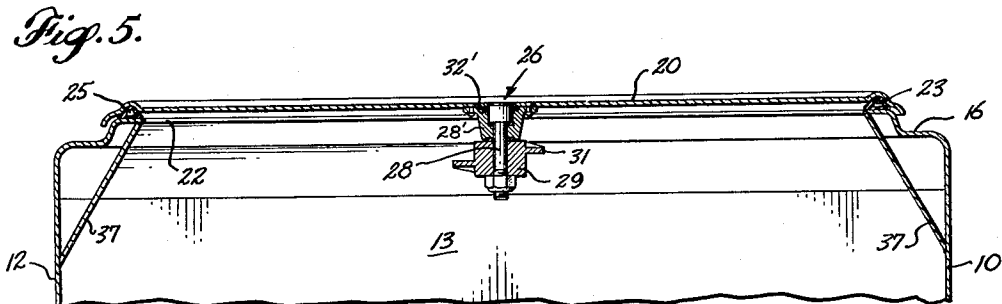
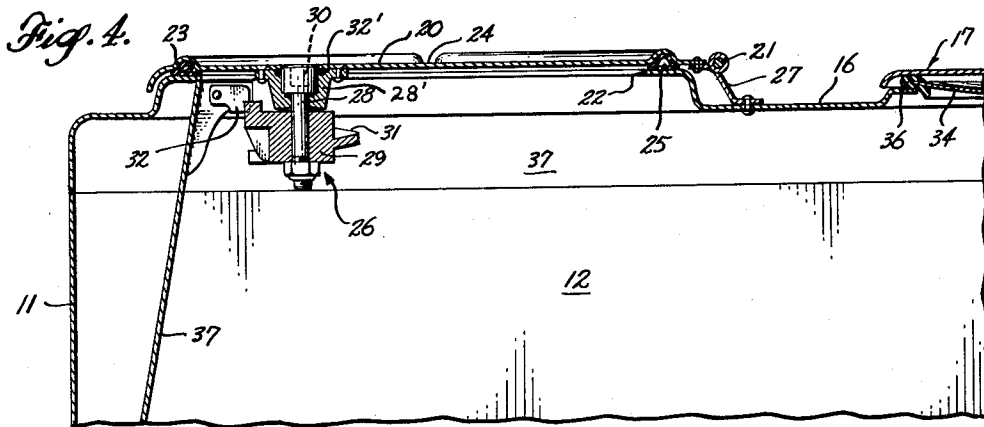
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2 Sheets-Sheet 2



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SHIPPING CONTAINER

George Gunn, Jr., Seattle, Wash., assignor, by mesne assignments, to Hoover Ball and Bearing Company, Saline, Mich., a corporation of Michigan
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1 Claim. (Cl. 220—30)

My invention relates to a shipping container.

More particularly my invention relates to a shipping container having a discharge door which is disposed on the top of the bin and is of an advantageous configuration.

Other objects and advantages of my invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed descriptions taken in connection with the accompanying drawings forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in this art.

FIG. 1 is a perspective view of a device embodying my invention;

FIG. 2 is a plan view of FIG. 1 and with the discharge door in the same position as shown in FIG. 1;

FIG. 3 is a similar view of the device as shown in FIG. 2 only the discharge door has been moved to discharge position rather than in closed position;

FIG. 4 is a fragmentary sectional view, on a larger scale than the previous figures, and taken substantially on broken line 4—4 of FIG. 2;

FIG. 5 is a fragmentary sectional view, on a smaller scale than FIG. 4, and taken substantially on broken line 5—5 of FIG. 2; and

FIG. 6 is a fragmentary sectional view, on a larger scale than FIG. 5, and taken substantially on broken line 6—6 of FIG. 3.

Now referring in more detail to the drawings, a bin having four sides as depicted by sides 10, 11, 12 and 13 is illustrated. The bin is supported by legs 14 and the bin sides and legs may be generally that described and claimed in U.S. Letters Patent No. 2,648,428.

However, the top structure of the present bin varies considerably over that disclosed in said U.S. Letters Patent.

Now referring more particularly to the top structure, the top structure includes nesting plates 15 which interfit with legs 14 to provide for high piling or in other words to permit the superimposing of one bin on another when desired.

The top wall generally indicated by 16 has a filler opening which is closed or opened by top opening filler lid 17. This filler lid 17 is preferably opened and closed by rotary action so that ears 18 engage or disengage with lugs 19 and there is sufficient cam action so that a suitable seal is provided.

There has been considerable trouble in this art to provide a top opening bin and such patents have issued as Patent No. 2,862,645. However such prior art has wasted a considerable portion of the capacity of the bin by the internal accessories. With the present invention there is substantially no loss of space and the full capacity of the bin can be realized in view of the nature of the top discharge opening door.

With the present invention, I provide a door member 20 hingedly connected to the top wall 16 by preferably a piano type hinge 21.

In order to seal the door 20 about a suitable opening 22 in the top wall 16, preferably the door 20 is provided with an internal gasket receiving groove 23. This may be done by a pressing operation. The groove 23 is broken or interrupted by flat surface portions 24 as best shown

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in FIGS. 1 and 2 of the drawings. Thus as the bin is exposed to outside weather conditions we have suitable drainage in that the convex portions of the wall forming groove 23 will not trap water. At the same time the rubber or resilient gasket 25 can suitably function even though we have the flat portions 24 which have been indicated as two members although a multiple number can be readily used if desired.

The door 20 is locked to the body of the bin by a locking device generally indicated by 26 and which operates on a cam principle mechanism.

In order that the door 20 in hinging about the piano hinge 21 may lie flat, when in open position as indicated particularly in connection with FIG. 6 of the drawings, many functional members are necessary. In the first place the door 20 is not only mounted on the piano hinge 21 but the piano hinge must be supported away from the top 16 by way of offset hinge leg 27. By reason of the said leg 27, the door 20 is elevated above the top wall 16 by an amount so that when the said door 20 is in an open position as best indicated in FIG. 6, the normal top side of the said door 20 will rest upon and be supported by the filler lid 17. At the same time the locking device 26 will be out of the way and not interfere with said door 20 resting on and be supported by the filler lid 17.

Now referring to the locking device 26, the same comprises a rotatable stem 28 supported by bushing 28' which is in turn attached to door 20. The said stem 28 is fixedly secured to a cam member 29. Rotation of stem 28 may be accomplished by internal key member 30 and thus by rotation of a suitable internal interfitting key engaging with the internal key 30, the stem 28 and cam 29 can be rotated so that the cam portions 31 will engage under and interlock with and provide desired pressure with the lugs 32 carried by the bin proper. An O ring 32' functions to seal against water following stem 28.

As has been disclosed in United States Letters Patent No. 2,648,428, it has been found necessary for commercial operation and satisfactory performance, that the side walls 10, 11, 12 and 13 be relatively flexible. The top member 16 is relatively rigid as is the door 20. The various parts of this device are formed of metal and preferably of aluminum. It is desirable and commercially necessary that the door 20 carry the gasket 25. In order to insure more rigid union between the said gasket 25 and the door 20, groove 23 is provided in the door 20 so that in addition to adhesives, we have some mechanical bond between the said gasket 25 and the door 20. Also in forming groove 23, we form convex and concave portions which function as reinforcing beading.

Now as to the gasket 25, modern technique has provided many elastomers of a synthetic type which in part are augmented by natural rubbers so that sealing gaskets and long wear thereof is no longer a serious problem. However there is the problem of both adhesively and mechanically adhering gaskets to a door and providing substantially a hermetical seal therebetween. The present invention provides such an appropriate seal and at the same time permits a ready release of the door through the locking device 26, the upper surface of which is flush with the top of the door 20.

The bin filler lid 17 (see FIG. 6) carries a pin or shaft 33 which rotatively supports a diaphragm or sealing disk 34 and permanent engagement between the shaft 33 and the disk 34 is suitably afforded by a cotter pin 35. This prevents accidental displacement of the parts so they are readily available for use and reuse. Also a suitable artificial elastomer fortified or unfortified with natural rubber is employed such as the gasket 36.

It is also important to note in my invention that the

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discharge door 20 has its hinge toward one side so as the door opens it opens substantially flush with one side of the bin. This provides for a rectangular shaped door 20 having the corners thereof cut off so that the bin can be reinforced at the top and with a minimum requirement for fillets inside to insure positive discharge of all the contents of the bin. An examination of FIGS. 4 and 5 and the notation of fillets 37 indicate the lack of lost space within the bin such as by the transmission members of Patent 2,862,645.

From the foregoing it will now be appreciated that a feature of the present invention is that the door 20 may be moved from closed position as shown in FIG. 2 of the drawings to open position as shown in particularly FIGS. 3 and 6 of the drawings and there is a distinct functional relationship between the said door 20 and the filler lid 17 in that the said filler lid 17 functions as a support for the said door 17 when the same is open. Thus in case of parties walking on the top of a bin or other objects become involved, the said door 20 will not be warped or wracked. In this connection the leg 27 is important in elevating the pivotal point of the piano hinge 21 to a distance so that in the combination the door 20 will lie substantially flat or parallel to the top of the top wall 16 and thus permit the filler lid 17 to function as the support indicated.

Obviously changes may be made in the form, dimension and arrangements of the parts of my invention without departing from the principle thereof, the above setting forth only a preferred form of embodiment of my invention.

I claim:

A shipping container for granular materials comprising a rectangular bottom wall provided adjacent its corners with depending legs, two pair of spaced substantially parallel rectangular side walls secured to and extending

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upwardly from said bottom wall, and a rectangular top wall secured to the upper ends of said side walls and having corner leg supporting portions positioned in substantial vertical alignment with said legs; means on said top wall defining an irregularly shaped opening disposed closer to the upper end of one of a pair of parallel ones of said side walls than to the upper end of the other one of said side walls in said pair, said discharge opening having a first pair of substantially parallel opposite edges one of which is shorter than the other and is disposed adjacent the upper end of said one side wall and between a pair of leg supporting portions, said discharge opening having a second pair of edges first portions of which diverge from opposite ends of said shorter edges at positions between a pair of corner leg supporting portions, said second pair of edges having second portions which are substantially parallel and are disposed adjacent the upper ends of the other pair of said side walls and intersect the longer edge in said first pair of edges at the ends thereof, a door shaped to overlies said discharge opening, hinge means for said door supported on said top wall at a position substantially parallel to and adjacent said longer edge of said opening, and coacting latch means on the underside of said discharge door and said container adjacent said shorter edge of said opening.

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