Oct. 6, 1959 G. H. PRIDE 2,907,508

CONTAINER FOR GRANULAR MATERIALS

Filed April 16, 1954

Fig. 1.

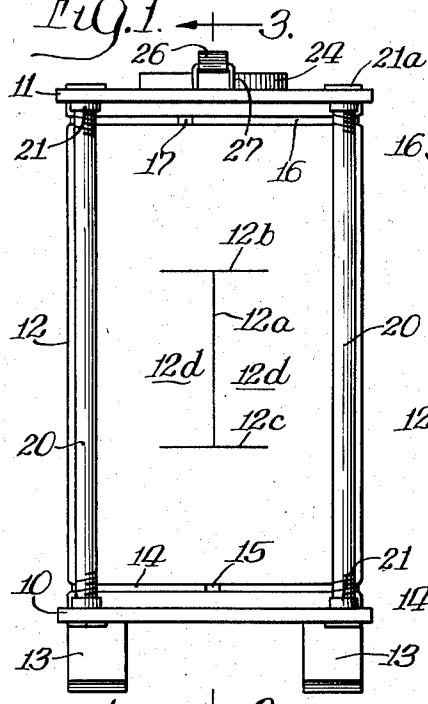


Fig. 3.

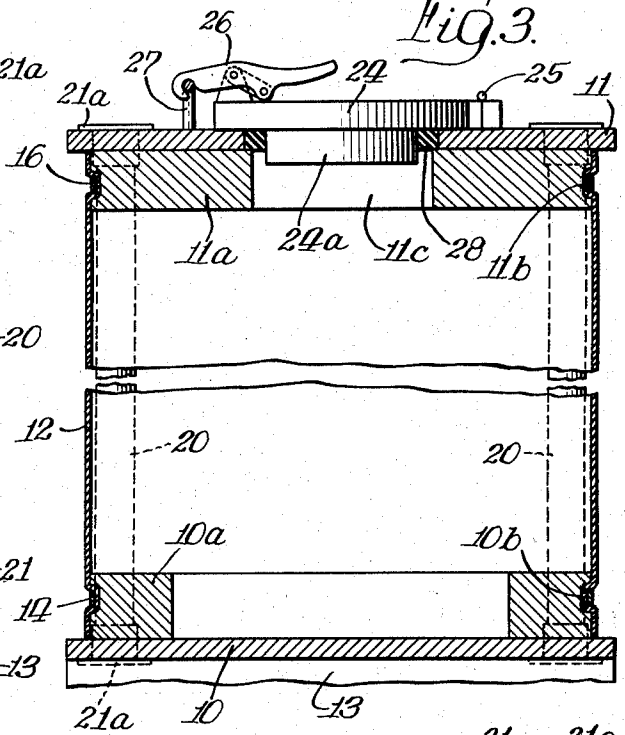


Fig. 2.

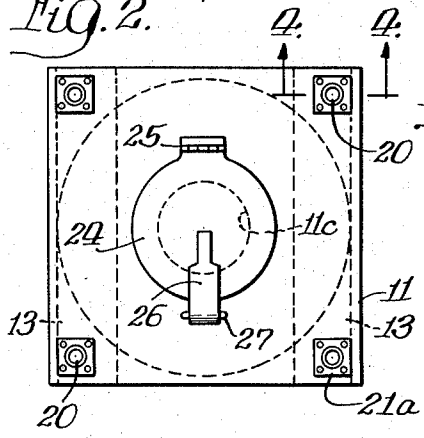


Fig. 4.

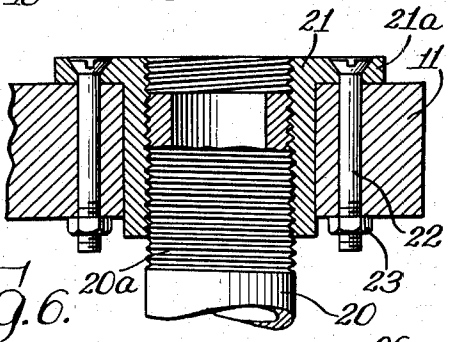


Fig. 5.

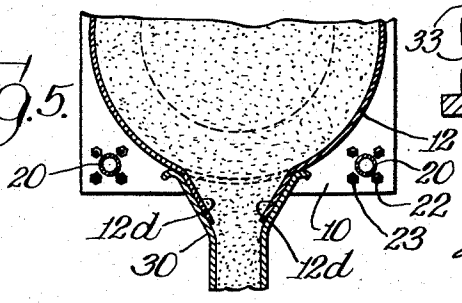


Fig. 6.

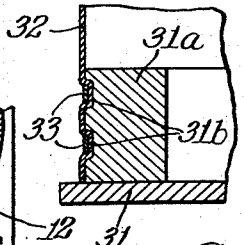
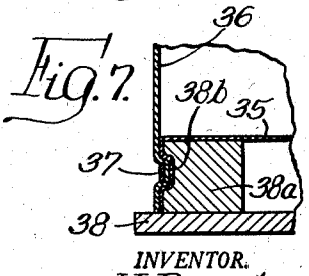


Fig. 7.



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CONTAINER FOR GRANULAR MATERIALS

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1 Claim. (Cl. 229—4.5)

This invention relates to an improvement in containers for granular materials, such as sugar and the like, and its purpose is to provide a simple and inexpensive shipping container of such construction that the major portions thereof may be cheaply and readily returned to the shipper after the contents have been removed at the destination of the shipment.

It is the usual practice to package sugar and other similar materials in cloth or paper bags so that they may be conveniently handled during shipment. For illustration, sugar is ordinarily shipped in bags each containing one hundred pounds but this method has not been satisfactory because the bags frequently break during shipment with a resulting loss of the contents. As a result, this almost inevitable loss is commonly included in the freight rates for the shipment of sugar. In the effort to avoid this loss, some shippers have shipped sugar in large metal boxes each holding as much as thirty-five hundred pounds of this product. This practice has reduced the loss which occurs when the sugar is shipped in bags but there is a substantial disadvantage in that the boxes, being preferably formed of light weight material such as aluminum, are expensive and, in addition, cannot be stored in a small space and may be returned to the shipper only at considerable cost.

The principal object of the present invention is to overcome the above mentioned difficulties and others by providing a novel form of container which may be cheaply manufactured and which may be used for shipping purposes with little likelihood of damage to its contents. A further object of the invention is to provide a shipping container for sugar and the like which is made up of complementary parts which may be readily assembled and disassembled so that it may be made to occupy a relatively small space for storage or shipment. Another object of the invention is to provide a container for granular materials comprising a plurality of complementary parts, one or more of which may be discarded at the destination of a shipment while permitting the remaining parts to be stored in small space and returned to the shipping point. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings,

Figure 1 shows an enlarged front elevation of the improved container of the present invention;

Fig. 2 shows a top plane view of the container illustrated in Fig. 1;

Fig. 3 shows an enlarged vertical section taken on the line 3—3 of Fig. 1 with parts thereof broken away;

Fig. 4 shows an enlarged detailed section taken on the line 4—4 of Fig. 2;

Fig. 5 shows a transverse section through the middle portion of the container when it has been laid on its side for the purpose of discharging its contents;

Fig. 6 shows an enlarged vertical section similar to the lower left-hand corner of Fig. 3, illustrating a modified form of the invention; and

Fig. 7 shows a vertical section similar to the lower left-hand corner of Fig. 3 illustrating still another modification of the invention.

As illustrated in the drawings, the invention comprises a lower plate or end wall **10** and an upper end wall or plate **11**, both formed preferably of aluminum or light weight metal, which are connected by an outer cylindrical wall **12** which is formed preferably of paper or other flexible and collapsible material. The plates **10** and **11** are of rectangular form and the lower plate **10** has secured to the underside thereof a pair of parallel skids or runners **13** which permit the fork of a lift truck to be inserted beneath the plate **10** for the purpose of moving the container during the operation of loading a freight car or other carrier. The lower plate **10** is provided with an upwardly extending ring or projection **10***a* which is formed integrally therewith or secured thereto and which is adapted to have a telescoping engagement with the lower end of the annular wall **12**. The ring **10***a* is provided around its outer margin with an annular groove **10***b* and the flexible wall **12** is secured to the ring **10***a* of the bottom plate by means of a metal strap or binder **14** which extends around the outer side of the wall **12** and which has its ends secured together by a seal **15**, or the like, after it has been drawn taut, thereby securing the annular wall **12** in fixed relation to the bottom wall **10**.

The top plate or cap **11** has secured thereto or formed integrally therewith a downwardly extending ring **11***a* which has a telescoping engagement with the upper end of the wall **12**. The ring **11***a* is provided with an annular groove **11***b* and the wall **12** is forced into this groove and thereby secured to the top plate of the container by means of a surrounding metal strap or binder **16** which is drawn taut around the wall **12** and then secured in the taut condition by a seal **17** or the like which connects its overlapping ends.

The plates or caps **10** and **11** are spaced apart and the annular wall **12** held in taut condition by means of spacing sleeves or rods **20** which extend between the upper and lower plates and which have threaded engagement with internally threaded sleeves **21** each having an outwardly extending annular flange **21***a* which seats against the outer face of one of the plates **10** or **11**. These sleeves are secured in position on the plates by means of bolts **22** which extend through the plates and the annular flanges **21***a* and which are engaged at their opposite ends by nuts **23**. The external threads **20***a* on the spacing members or rods **20** extend in opposite directions at the opposite ends of each spacing member so that, upon rotation of a member **20**, by means of a pipe wrench or the like, it draws the plates **10** and **11** together or forces them apart. Thus, by adjusting all of the spacing members **20** the plates **10** and **11** may be separated in order to draw the annular wall **12** taut and hold it in that condition. In addition to performing the function of spacing the end plates **10** and **11** apart and holding the annular wall **12** in a taut condition, the spacing members **20** serve to protect the annular wall **12** so that it is unlikely to be injured during the shipment of the filled container.

The container is filled through the top plate **11** through a central opening **11***c* which is normally closed by a cover **24**, hinged at **25** on the top plate and adapted to be secured at its other side to the top plate by means of a latch **26** which engages a ring **27** secured in the upper side of the top plate. A rubber ring **28** is secured within the central opening of the upper part of the top plate **11** and slightly overlaps the outer margin of the

opening in the ring or projection 11*a*, thus forming a sealing ring which prevents leakage around the central projection 24*a* of the cover which extends downwardly from the under side thereof. When the container has been filled, the cover 24 may be swung to its closed position as shown in Fig. 3 and secured in that position by means of the latch 26.

When the filled container reaches its destination, it may be turned on its side and then emptied after slitting the flexible collapsible wall 12 along the slitting lines 12*a*, 12*b* and 12*c* which are marked on the outer surface of the wall 12 at the time of its manufacture. This tubular member 12 is preferably formed of a plurality of layers of paper or the like which are glued together and which are arranged with the grain of the material extending in right angular directions in adjacent layers so that a strong and durable outer wall is formed. After this wall has been slitted along the lines 12*a*, 12*b* and 12*c*, it may be turned over a funnel 30, as shown in Fig. 5, and the flaps 12*d* which are formed on opposite sides of the opening in the wall by the cut made along the line 12*a* may be turned downwardly on the inside of the funnel to protect the sugar or other material from direct contact with the upper open end of the funnel. In this way, the sugar or other granular material may be readily discharged into a storage bin or other receptacle.

After the container has been emptied, the binding straps 14 and 16 may be cut to release the wall 12 from the end plates 10 and 11 and these binding straps and the wall 12 may then be discarded. The end plates 10 and 11 with the skids 13 and the spacing members 20 may then be packed in a relatively small and compact bundle for shipment back to the place where the container was originally filled, whereupon these parts may be assembled with another flexible wall 12 and new binding straps for further use.

In Fig. 6 of the drawings there is illustrated a modified form of the invention in which the lower plate 31, corresponding to the plate 10, has a ring or projection 31*a* which is provided around its outer edge with a pair of grooves 31*b* into which the flexible annular wall 32 may be forced by a pair of binding straps 33 which have their ends secured together after being drawn taut, in the manner previously described.

The end plates of the container are preferably formed of aluminum or other nonabrasive metal of light weight so that they do not add materially to the weight of the package while at the same time lending themselves to thorough cleaning operations preliminary to re-use. In addition to cleaning the end plates of the container, the contents may be further protected by providing the end plates with inner cover sheets 35 of paper or the like which extend transversely across the inner faces of the annular rings of the end plates and which have their outer margins turned transversely so that they are concentric with the outer wall 36 of the container, as shown in Fig. 7. Then, when a binding strap 37 is secured around the end of the flexible wall 36, this wall as well as the flange of the cover plate 35, is forced into the annular groove 38*b* which is formed in the outer surface of the ring portion 38*a* of the end plate 38. After the contents of the container have been emptied the cover sheets 35 may be discarded along with the flexible annular wall 36 and the binding straps 37.

Although one form of the improved container has been shown and described together with two modifications of certain features thereof, it will be understood that the invention may be constructed in various other embodiments which come within the scope of the appended claim.

I claim:

A knock-down type shipping container for granular materials such as sugar and the like, comprising a readily disposable flexible non-metallic cylindrical tube open at its upper and lower ends, an imperforate rigid bottom wall for closing the lower end of the tube, means securing the lower end of said tube to said bottom wall, including an upstanding cylindrical projection on said bottom wall having a diameter only slightly less than that of said tube and telescopically received within the lower end portion of said tube, and a taut metal strap wrapped around said lower portion of said tube for clamping the same tightly around said cylindrical projection, a disposable liner member overlying said bottom wall and said upwardly extending projection, the edges of said liner member being clamped by said taut strap between the periphery of said upwardly extending projection and the inner surface of said tube, a rigid top wall for closing the upper end of said tube, means securing the upper end of said tube to said top wall, including a downwardly extending cylindrical projection on the underside of said top wall having a diameter only slightly less than that of said tube and telescopically received within the upper end portion of said tube, and a taut metal strap wrapped around said upper portion of said tube for clamping the same tightly around said downwardly extending cylindrical projection, a plurality of internally threaded sleeves on said top and bottom walls uniformly disposed outside the areas of said walls occupied by said cylindrical projections, rigid support rods extending between said top and bottom walls for supporting said top wall in spaced relationship with respect to said bottom wall, the opposite ends of said rods being threaded in opposite directions and being in threaded engagement with opposed ones of said sleeves in said top and bottom walls, whereby rotation of said rods about their longitudinal axes will vary the spaced relation of said top and bottom walls and vary the degree of tautness of said tube, said top wall having a centrally disposed opening therein having a diameter substantially less than that of said tube through which the interior of said tube may be filled with the granular materials for shipment, a cover on said top wall for closing said opening, and means for securing said cover in closed position, said tube and said disposable liner being readily discarded and the remaining parts of said shipping container being subject to convenient disassembly for easy return shipment when shipping container has reached its destination and has been unloaded.

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