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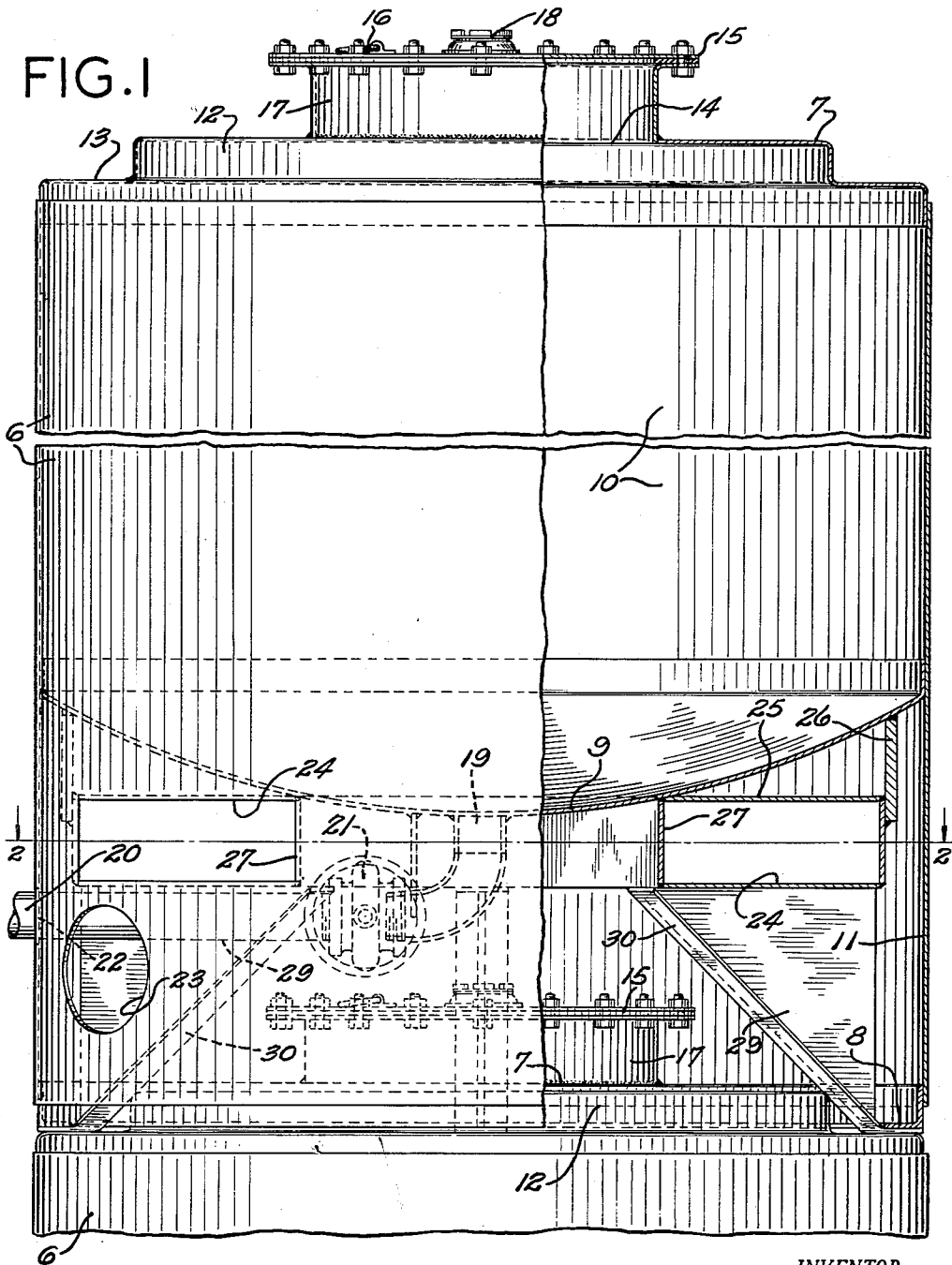
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3,122,276

BULK MATERIAL HANDLING CONTAINER

Filed Aug. 22, 1960

2 Sheets-Sheet 1



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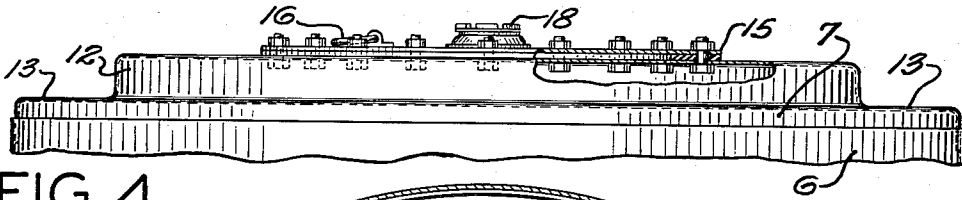


FIG. 4

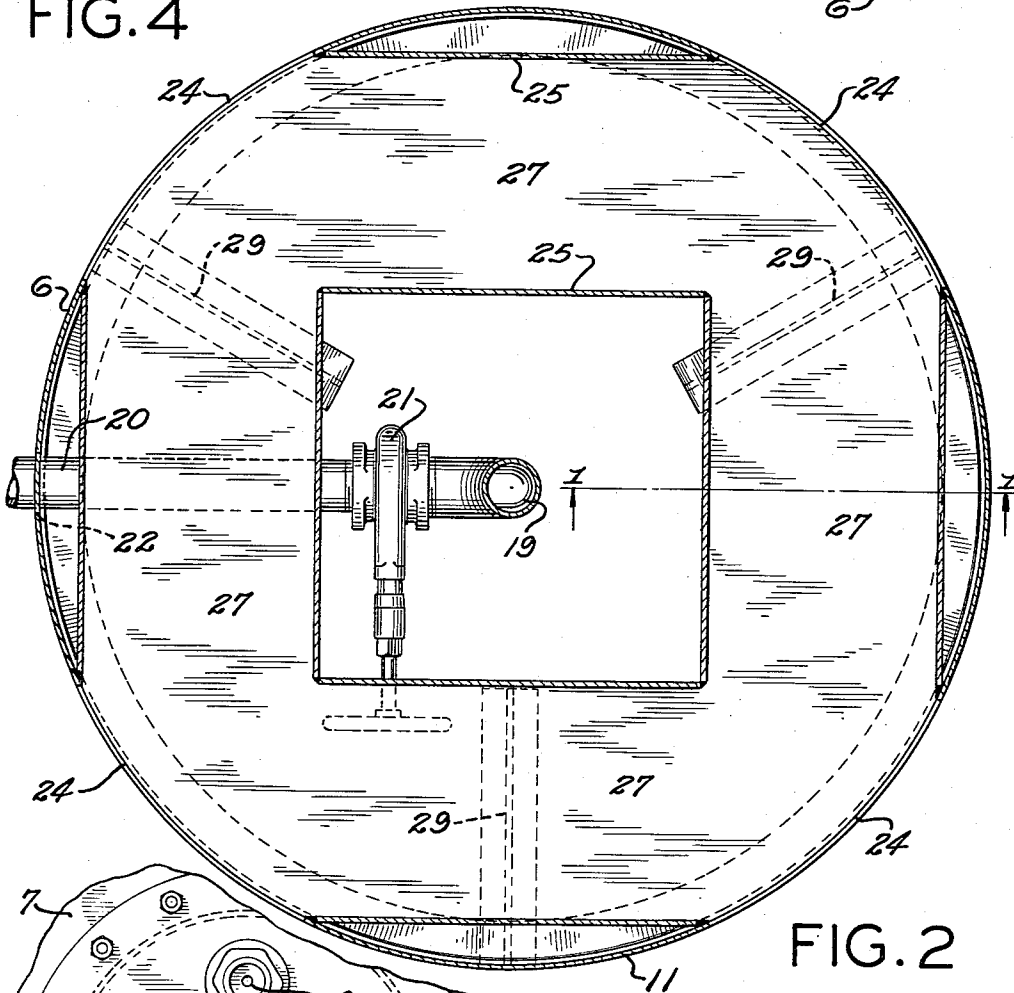


FIG. 2

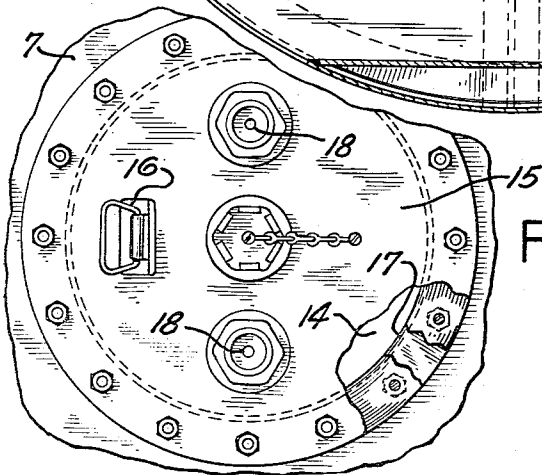


FIG. 3

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BULK MATERIAL HANDLING CONTAINER
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3 Claims. (Cl. 222-143)

This invention relates in general to improvements in the art of handling batches of fluent materials, and it relates more specifically to improvements in the construction and mode of manipulating containers especially adapted for the reception of bulk liquids such as paint or the like.

The primary object of the present invention is to provide an improved bulk material confining and handling container which is simple and durable in structure and efficient in use.

Some of the more important specific objects of the invention are as follows:

To provide an improved receptacle for facilitating the confinement, storage and/or transportation of batches of fluent material, which is especially adapted to withstand rough treatment and to be compactly associated with other similar receptacles in order to avoid waste space, and in referring to fluent material, it is intended to include semi-liquids, semi-solids, powders, crystals and other flowable materials.

To provide an improved tank for liquids such as paint which require periodic agitation, in which the confined bulk material may be effectively agitated either before or while it is being drawn off, and the interior of which may be readily cleaned to permit reuse of the tank.

To provide an improved container of relatively large capacity and great strength which is capable of being conveniently handled and transferred by means of fork trucks, and which is especially adapted to be stacked with other identical containers in a stable manner.

To provide a relatively light weight but strong liquid receptacle adapted to be quickly filled and to effectively seal and confine bulk liquid which is apt to deteriorate in the presence of air, but from which batches of the material can be conveniently withdrawn and which may be reloaded for reuse when empty.

To provide an improved container assemblage which can be readily fabricated of sheet metal and standard bar stock in various sizes for diverse uses, and which may be conveniently handled and transported especially by trucks.

These and other objects and advantages of the invention will be apparent from the following description.

A clear conception of the features constituting the present improvement, and of the construction and mode of using a commercial bulk material handling container embodying the invention, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

FIGURE 1 is a fragmentary part sectional side elevation of one of the improved containers, having a portion of the outer wall broken away to diminish the height of the tank, and the section being taken centrally along the line 1-1 of FIGURE 2;

FIGURE 2 is a transverse horizontal section taken through the container of FIGURE 1 along the line 2-2 looking downwardly;

FIGURE 3 is a top view of the material inlet cover portion only of the same container; and

FIGURE 4 is a fragmentary side view of the upper part of a similar container having a modified inlet portion.

While the invention has been shown and described herein as having been embodied in a relatively large capacity tank assemblage especially useful for handling bulk paint, it is not intended to confine the novel features

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to such large containers and for such usage; and it is also contemplated that specific descriptive terms employed herein be given the broadest possible interpretation consistent with the disclosure.

Referring to the drawings the improved bulk material container shown comprises in general, an annular outer upright wall 6 provided with an upper end head 7 and with a lower end base ring 8, and having therein a transverse partition 9 which cooperates with the head 7 to form a material confining chamber 10 while converting the portion of the wall beneath this chamber into an annular apron 11. The wall 6 may be of any height depending upon the tank capacity required, and the upper end head 7 is provided with a central dome 12 surrounded by an annular shoulder or shelf 13, and this dome has a central inlet 14 for the chamber 10 normally sealed by a removable cover 15 provided with a handle 16 and vents 18, and which coacts with an annular element 17 surrounding the inlet. As shown in FIGURE 1, the element 17 is relatively tall but this element 17 may be substantially reduced or entirely eliminated as in FIGURE 4, in order to reduce the overall height of the dome assembly.

The transverse partition 9 is preferably dished as shown in FIGURE 1, and is provided with a lower outlet 19 for the chamber 10 which is communicable with a laterally extending discharge conduit 20 having a control valve 21 therein and which is directed toward and in alignment with a hole 22 formed in the apron 11. The apron 11 is also provided with a handhole 23 for permitting easy access to the valve 21, and moreover has four equally spaced and horizontally aligned openings 24 therein, as illustrated in FIGURES 1 and 2. A casing 25 which is mounted within the apron 11 directly beneath the partition 9 and is firmly attached to the latter by props 26, forms two sets or pairs of intersecting passages or spaces 27 all of which are in open communication with the openings 24, and these openings permit the forks of standard material handling trucks to be inserted into the spaces 27 and applied to the casing 25 in order to bodily lift the container.

The base ring 8 is rigidly attached to the lower end of the annular apron 11 and extends inwardly therefrom, and an annular series of three radial braces 29 having downwardly and outwardly inclined edges 30 connect the casing 25 with the base ring 8. These braces 29 are rigidly attached to the bottom of the casing 25, to the inner surface of the wall apron 11 and to the base ring 8, and are equally spaced about the central axis of the container so as to avoid interfering with the control valve 21, but the number of braces 29 may be varied if desired. The entire structure may be fabricated from durable sheet metal, standard structural steel, and standard pipe fittings and valves, and it is contemplated that various metals such as stainless steel as well as such non-ferrous metals as copper, aluminum and the like may be used in the fabrication thereof. Of course, the rigid base assemblage formed by the apron 11 and internal structure must be formed to permit stacking of similar containers upon each other in vertical alinement without interference.

When the improved bulk material handling containers have been constructed as above described, each unit may be conveniently supplied with liquid material upon removal of the cover 15 while the valve 21 is closed, and when the cover 15 is reapplied and clamped in place the admitted material confined within the chamber 10 will be hermetically sealed from the ambient atmosphere. The sealed container may thereafter be vibrated or shaken to agitate its contents, and such agitation may even be con-

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tinued while material is being drawn off by opening the valve 21.

While such loading and unloading of the chamber 10 may ordinarily be effected while the base ring 3 is resting on a fixed support, the unit when loaded may be readily lifted and transferred from place to place by merely applying the lifting and lowering fork of a standard transfer truck through either pair of the apron openings 24 in an obvious manner. Removal of the cover 15 is facilitated by the handle 16 upon removal of the bolts 16' so as to gain access to the interior for cleaning or the like when necessary.

In order to conserve on space while storing or transporting the improved units, they can be easily stacked upon each other as illustrated in FIGURE 1. When thus stacking the receptacles, the dome structure of the lower container will fit without obstruction within the free central zone in the apron 11 of the superimposed unit, and the shoulder or shelf 13 of the supporting unit will coact with the base ring 3 of the upper unit, while the inclined edges 30 of the braces 29 will function to centralize the stacked assemblages and thus enhance the stability. Such stacking to any desired height may be effected when the tanks are empty or filled, either for storage or transportation purposes.

From the foregoing detailed description it will be apparent that the present invention in fact provides a bulk material confining container which is simple and durable in structure and efficient in use especially when the material is subject to deterioration while subjected to air. The improved receptacles may be conveniently filled, emptied, transported and stacked, and may also be formed of relatively light sheet material so that the final assemblages have minimum weight. The provision of the four openings 24 cooperating with the crossed passages in the casing 25 permits the truck forks to be applied in various directions for convenient transportation, and the invention has proved highly satisfactory and successful in actual use, especially in tanks of relatively large capacity.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A bulk material container comprising, an annular

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outer upright wall having an upper end closure and being provided between its ends with a partition forming a material confining chamber located between said end closure and said partition, the depending portion of said wall below said partition constituting a support for the container, an upstanding annular dome of smaller diameter than said wall formed on said end closure coaxially thereof to provide an annular outwardly unobstructed shoulder adjoining said wall, an access opening for said chamber formed in said annular dome and provided with a closure, said depending wall portion being formed with substantially rectangular openings for the reception of the forks of a material handling truck, and an annular series of outwardly and downwardly tapered radial braces rigidly secured between said partition and said depending wall portion, said depending wall portion being engageable with the annular shoulder of a similar container and said braces being directly cooperable with the dome of the latter to permit stacking of the containers while insuring coaxial alinement thereof.

2. A bulk material container according to claim 1, wherein the lower end of the depending wall portion is provided with a base ring to which the lower outer ends of the braces are secured and which forms an annular stabilizing foot engageable with the annular shoulder of a similar container.

3. A bulk material container according to claim 1, wherein at least one pair of horizontally alined rectangular openings are provided in the depending wall portion and a casing is secured within the depending wall portion to connect the alined openings and thus form tubular passageways for the forks of the material handling truck.

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