

Sept. 4, 1956

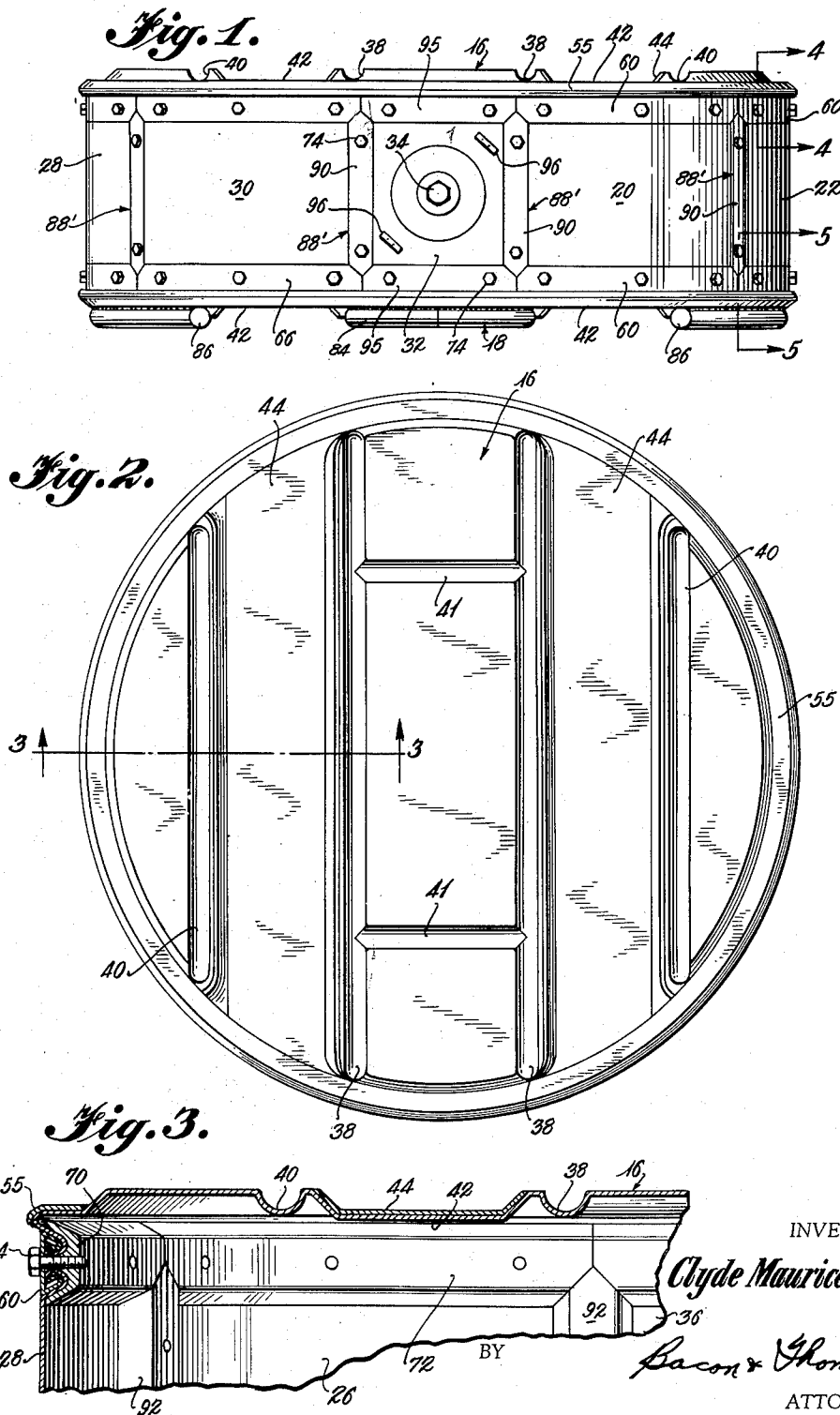
C. M. MOORE

2,761,582

DEMOUNTABLE STRUCTURE

Filed Aug. 1, 1950

3 Sheets-Sheet 1



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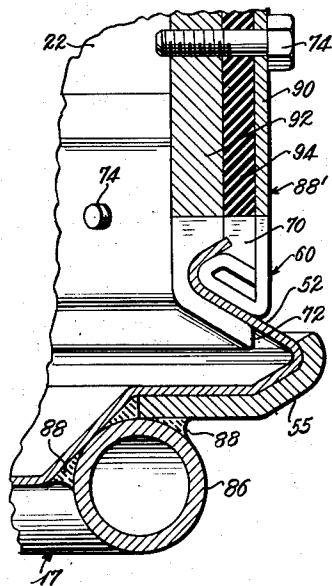
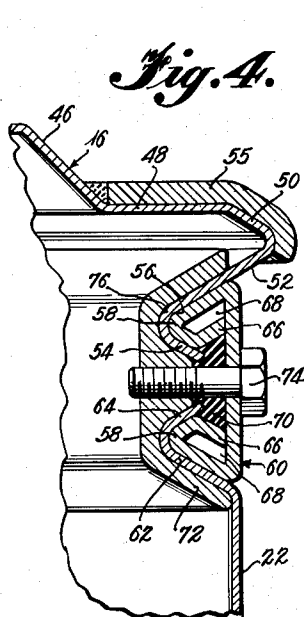
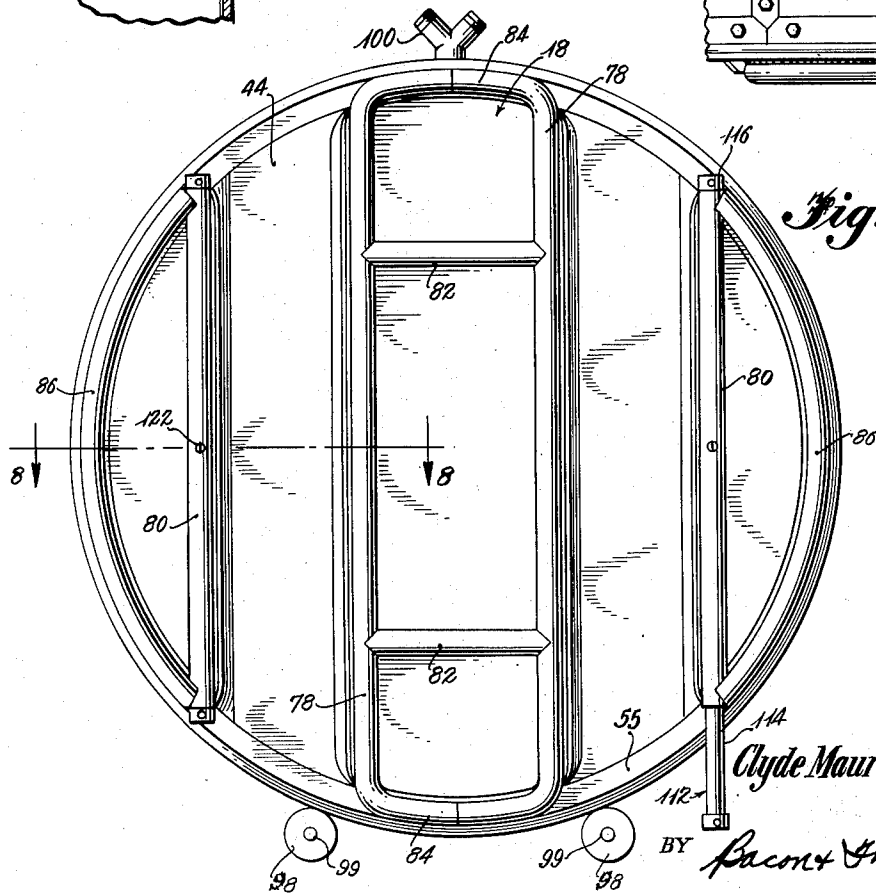
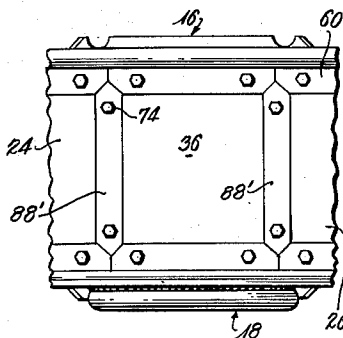


Fig. 6.



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Fig. 8.

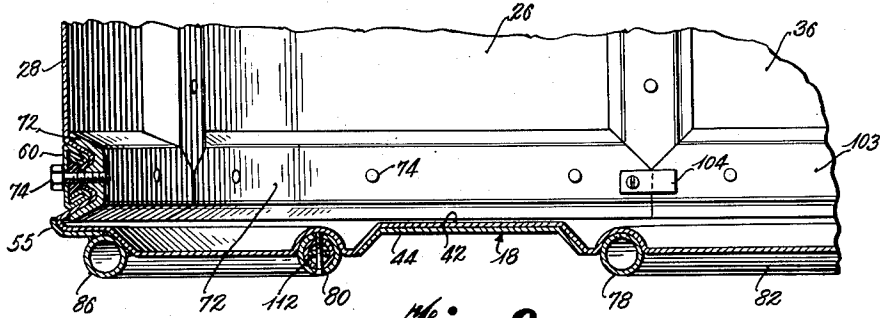


Fig. 9.

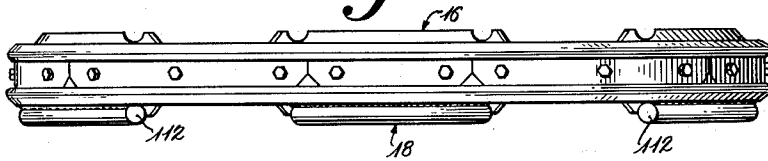


Fig. 10.

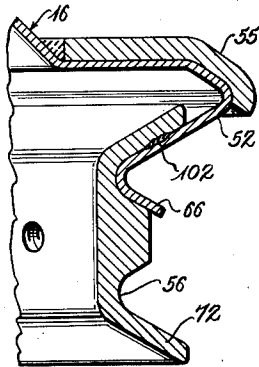


Fig. 11.

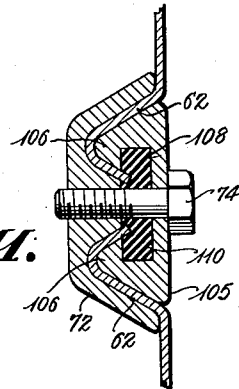


Fig. 12.

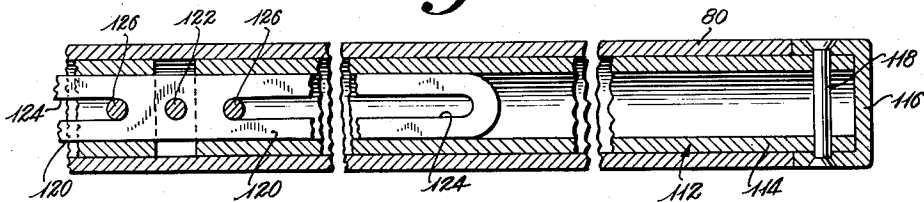
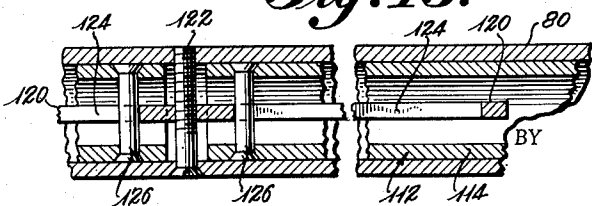


Fig. 13.



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2,761,582

DEMOUNTABLE STRUCTURE

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6 Claims. (Cl. 220—5)

This invention relates to a demountable structure, and more particularly, to an improved shipping drum particularly adapted to contain liquid materials, which drum may be readily handled when filled but which may be shipped in collapsed condition and then easily assembled into a leak-proof container.

The shipping drum of the present invention is particularly suitable for replacing the standard 50 gallon steel shipping drum frequently employed for shipping liquid materials although the drum may be made of any desired size. The standard drum has an axial length considerably greater than its diameter and when filled with liquid is difficult to handle. Efficient manual handling of such filled drums has therefore been largely limited to the rolling of single drums along a smooth floor or up a slight incline. Even lift fork trucks can usually handle a single drum only at a time and the moving of a number of drums at a time has required the use of slings and hoisting machinery.

On the contrary, the drum of the present invention has an axial length which is very much shorter than its diameter, preferably about one-third of its diameter, and has been described as a "pancake" drum. The drum of the present invention may be rolled along a floor or up an incline in the same manner as the standard drum but in addition, it can be readily lifted manually even when filled, particularly when provided with suitable handles, as described below. Furthermore, one or a plurality of drums can be effectively handled by a standard lift fork truck without the use of platforms.

The drum of the present invention may have a plurality of wall sections detachably secured to each other including upper and lower head sections and a plurality of side wall sections such that the drum may be completely disassembled for shipment to the point of original use or, after use, for return shipment. The heads of the drum may be secured together and employed as a shipping container for the other sections of the drum such that the drum may be shipped in collapsed condition so as to occupy a small fraction of the space normally occupied by an empty drum. When in assembled condition for containing liquids, a system of intersecting sealing joints is provided in which a plurality of sealing elements made of flexible or resilient flowable material produce a seal extending continuously throughout the system of joints. The sealing elements contact each other in pressure-transmitting engagement at the intersections of the joints, all of the sealing elements being placed under pressure analogous to hydrostatic pressure. The heads of the drum are of considerable extent but may be provided with reinforcing elements some of which may be employed to contain extensible handles for the drum. Also, the reinforcing elements may form interlocking members when the drums are stacked to prevent lateral sliding between superimposed drums and furthermore may provide entrance channels for the forks of lift fork trucks either between the various drums in the stack or beneath the lowermost drum

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of the stack. Also the drum may be provided with suitable filling and emptying closures including a knock-out section for rapid filling and emptying of the drum.

It is therefore an object of the present invention to provide an improved shipping drum having an axial length which is a fraction of its diameter.

Another object of the invention is to provide an improved shipping drum in which the axial length of the drum is a fraction of its diameter and the resulting large diameter heads are reinforced.

Another object of the invention is to provide a demountable shipping drum which may be readily disassembled and the heads reassembled together to form a shipping container for the remaining parts of the drum, the resulting structure occupying a small portion of the space occupied by an empty drum.

Another object of the invention is to provide a shipping drum of improved form which may be shipped in collapsed condition when empty and readily assembled into a leak-proof container at the point of filling.

Another object of the invention is to provide a shipping drum having reinforced head members in which the reinforcements provide interlocking portions between the various portions in a stack to prevent lateral shifting of the drums in the stack.

A further object of the invention is to provide a shipping drum having reinforced head members in which the reinforcing portions provide channels for the entrance of forks of lift fork trucks either between the drums in a stack or beneath the lowermost drum of the stack.

A further object of the invention is to provide an improved shipping drum having extensible handles to aid in handling the drum.

A still further object of the invention is to provide an improved shipping drum having an axial length which is a fraction of its diameter and which provides for rapid filling and emptying of the drum as well as for ease in withdrawing a small amount of material from the drum.

Other objects and advantages of the invention will appear in the following detailed description of a preferred embodiment shown in the attached drawings, of which:

Fig. 1 is a front elevation of the drum of the present invention;

Fig. 2 is a plan view of the drum;

Fig. 3 is a fragmentary vertical cross-section on an enlarged scale taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary vertical cross-section on a further enlarged scale taken on the line 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 4 taken on the line 5—5 of Fig. 1;

Fig. 6 is a partial back elevation of the drum of Fig. 1;

Fig. 7 is a bottom view of the tank of Fig. 1;

Fig. 8 is a fragmentary vertical cross-section on an enlarged scale taken on the line 8—8 of Fig. 7;

Fig. 9 is a view similar to Fig. 1 showing the heads of the drum assembled together to form a shipping container for the remaining parts of the drum;

Fig. 10 is a fragmentary vertical cross-section illustrating how certain of the clamping bars may be secured to wall sections of the drum;

Fig. 11 is a view similar to Fig. 10 showing a modified form of sealing joint;

Fig. 12 is a fragmentary horizontal cross section through a suitable handle structure; and

Fig. 13 is a fragmentary vertical cross-section of the structure of Fig. 12.

Referring more particularly to the drawings, the drum may have an upper head section 16 and a lower head section 18 and a plurality of similar side wall sections 20, 22, 24, 26, 28 and 30 (Figs. 1 and 6). It may also be provided with a knock-out side wall section 32 (Fig. 1) having a filler opening provided with a screw-threaded

plug 34. As explained below, the entire section 32 may be easily removed to rapidly empty or fill the container or the plug 34 may be removed for less rapid emptying or filling. The drum may also have another wall section 36 opposite the knock-out section 32 (Fig. 6) of the same size as the knock-out section. The various sections of the drum including the head sections are all detachable from each other and are secured together by sealing joints, as will be more fully described below.

The cross-section of a suitable upper head section 16 is shown in Fig. 3 and such head section may be provided with a plurality of spaced depressed grooves 38 and 40 extending across the head. Also a plurality of depressed grooves 41 may extend between the grooves 38. Between the grooves 38 and 40 the metal of the head section may be depressed to provide a channel portion 42 and this channel portion may be reinforced by a channel shaped member 44 secured to the channel portion in any suitable manner, such as by spot or tack welding. As explained below, the reinforcing channel member 44 forms a part of an opening between the drums for receiving the fork of a lifting truck, when a number of drums are stacked.

The circumferential edge of the upper head section 16 may have the form shown on a large scale in Fig. 4. That is to say, the peripheral edge of the head may first be bent downwardly to provide a frusto-conical portion 46 and then extend outwardly to provide an annular portion 48. The outer edge of the annular portion 48 is again formed downwardly to provide another frusto-conical portion 50 and then inwardly to provide an inwardly inclined flange portion 52 terminating in a reversely bent outwardly extending flange portion 54. A continuous reinforcing ring 55 may be provided to fit the annular portion 48 and frusto-conical portion 50 of the edge of the head and may be secured thereto in any suitable way such as by spot or tack welding.

Flange portions 52 and 54 form part of a circumferential sealing joint between the head and side wall sections and provide a groove 56 for receiving one edge flange 58 of an arcuate sealing bar 60 also having a similar edge flange 58 on its other edge. All of the side wall sections, including the side wall sections 22 shown in Fig. 4, have inwardly extending inclined flanges 62 provided with return bent portions 64 extending completely around their edges. As shown in Fig. 4, the flanges 62 provide a groove which engages the other edge flange 58 of the sealing bar 60 in the same manner that the groove 56 of the flange 52 of the head member engages an edge flange 58 of the sealing bar 60.

The edge flanges 58 of the sealing bar 60 may have return bent portions 66 contacting the body portion of the sealing bar 62 and spaced from the main portion of the flanges 58 to provide openings 68 extending longitudinally of the sealing bar. The flanges 58 of the sealing bar provide a channel for receiving a sealing element 70 of flexible or resilient flowable material into which the return bent portions 54 and 64 of the flanges 52 and 62, respectively, of the head and side wall sections are adapted to be pressed when the flanges of the head and side wall sections are clamped against the sealing bar 60. The return bent portions 66 are resilient and resiliently resist lateral expansion of the sealing element 70 when this element is placed under pressure. An internal clamping bar 72, screw-threadedly receiving bolts 74, which extend through the sealing bar 60 and sealing element 70, may be employed to clamp the flanges of the head and side wall sections to the sealing bar 60. This clamping bar 72 may have grooves 76 fitting the flanges 52 and 62 and upon tightening of the bolts 74, the return bent portions 54 and 64 of the flanges 52 and 62, respectively, are pressed into the sealing element 70. This places the sealing element 70 under pressure, and as more fully described below, all of the sealing elements of the system of joints are in pressure-transmitting contact with each other so that a pressure analogous to hydrostatic pres-

other so that a pressure analogous to hydrostatic pressure is established on all of the sealing elements extending throughout the system of joints.

As shown more clearly in Figs. 7 and 8, the lower head section 18 is a duplicate of the upper head section 16 except that reinforcing tubes 78, 80 and 82 are secured in the grooves 38, 40, and 41, respectively, in any suitable manner, such as by spot or tack welding, and the corresponding portions of the two head members have been given the same reference numerals. The tubes 78 have their end portions 84 bent laterally to conform with the curvature of the reinforcing ring 55, as shown in Fig. 7, and may also be welded together and to the reinforcing ring 55. The cross tubes 82 may have their ends notched to fit the tubes 78 and may be suitably secured thereto, for example, by welding. Arcuate reinforcing tubes 86 may be provided adjacent the lateral edges of the lower drum head and may be secured to the reinforcing ring 55 and to the lower head section by welding, for example, as indicated at 88 in Fig. 5. The tubes 86 may have their ends notched to fit the tube 80 and may be secured to the tubes 80 in any suitable manner, for example, by welding.

The lower head member 18 may be secured to the side wall sections, such as sections 28 of Fig. 8, by a sealing joint including a sealing bar 60 and a clamping bar 72. The details of this sealing joint are shown most clearly in Fig. 5 and may be the same as the joint shown in Fig. 4 between the upper head section and the side wall sections. The section shown in Fig. 5 is, however, taken at the intersection between the circumferential sealing joint 88' joining the lower head section 18 and the side wall sections and an axially extending sealing joint joining two side wall sections, such as the sections 20 and 22. The joint 88' between the side wall sections 20 and 22 may include a sealing bar 90 and a clamping bar 92 having the same cross-section as the corresponding parts of the joint illustrated in Fig. 4, the bars of the joint 88' being straight instead of being arcuate. The sealing and clamping bars of the intersecting joints are mitered, as shown in Fig. 1, such that the sealing element 94 of the sealing bar 90 of the axially extending joint 88' has its end abutting the sealing element 70 of the sealing bar 60 of the circumferential joint. Tightening of the bolts 74 of the joint 88' presses the clamping bar 92 thereof against the sealing element 94 and tightening of the bolts 74 of the circumferential joint presses the clamping bar 72 thereof against the sealing element 70 to cause these sealing elements to flow together and completely fill the intercommunicating channels of the intersecting joints.

It will be understood that the other joints between the various side wall sections may be the same as the joint 88' just described and that similarly, the joints joining all of the side wall sections to the head sections may be the same as that illustrated in Fig. 4.

The drum structure thus far described may be fabricated in a plurality of parts and may be assembled by properly fitting the various head sections, side wall sections and sealing and clamping bars together and tightening the bolts 74. As illustrated in Fig. 9, the two head sections 16 and 18 may be secured together by a single circumferential joint to provide a collapsed container occupying much less space than a complete drum illustrated in Fig. 1. Sufficient room is provided within the collapsed container to contain all of the remaining parts of the drum including the side wall sections and the various sealing and clamping bars not employed to assemble the collapsed drum of Fig. 9.

When the drum is assembled to contain liquid or other materials as illustrated in Fig. 1, the drum may be filled or emptied by removing the screw-threaded closure element 34, or if rapid filling or emptying is required, the entire section 32 may be removed by loosening the bolts 74 in the joint surrounding such section, removing the sealing bars 92 and 95 surrounding the section 32 and pulling out the entire section 32. If desired, the section 32 may be

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provided with apertured members 96 suitably secured thereto for receiving pulling hooks. The section 32 may be replaced and the sealing bars 92 and 95 applied and the bolts 74 again tightened to completely seal the drum.

As illustrated in Fig. 7, loading and unloading stations may be conveniently provided with a pair of rollers journaled for rotation about axes 99. The rims provided by the reinforcing rings 55 of the drum heads may be supported on the rollers 98 with the axis of the drum extending horizontally. A faucet adapter 100 may be substituted for the screw-threaded closure member 34 and the drum may be readily rotated on the rollers 98 about its axis to draw a desired amount of liquid from the drum through the faucet adapter 100, it being understood that the faucet adapter may also be provided with a conduit for venting the interior of the drum above the liquid therein. In the position of the drum shown in Fig. 7 the entire knock-out section 32 may be removed or inserted without discharging liquid from the drum. The drum may be rapidly filled through the large opening thus provided and when emptying the drum, the entire drum may be rotated on the rollers 98 to quickly dump the contents of the drum into any suitable container placed below the rollers 98.

In the description of the improved drum thus far, it has been assumed that all of the various parts are entirely separate including the various wall sections and sealing bars and clamping bars. Most of the clamping bars may, however, be permanently secured to wall sections so as to retain them in position during application of the sealing bars and associated bolts 74. For example, the clamping bars of half of the upper circumferentially extending joint may be permanently secured to the upper head member 16, as illustrated in Fig. 10. Thus, the clamping bar 72 may be secured to the flange 52 of the head member in any suitable manner, for example, by spot welding, as indicated at 102. The clamping bars of the opposite half of the lower circumferentially extending joint may similarly be permanently secured to the lower head member 18. For example, the clamping bars of the upper circumferential joint which corresponds to the sections 22, 24, 36 and 26 may be permanently secured to the upper head member 16 and the clamping bars of the lower circumferential joint which correspond to the sections 28, 30, 32 and 20 may be permanently secured to the lower head section 18. Furthermore, the side wall sections 20, 24, 26 and 30 may have axially extending clamping bars 92 permanently secured to both of their lateral edges and circumferentially extending clamping bars 72 secured to one of their circumferential edges in the same manner as shown in Fig. 10. The sections 22 and 28 may have circumferentially extending clamping bars 72 permanently secured to one of their circumferential edges.

In assembling the drum, the side wall sections 22, 24, 36 and 26 may first be assembled with the upper head section 16 by properly fitting the circumferential edges of such side wall sections which do not have clamping bars permanently secured thereto to the clamping bars 72 permanently secured to the head section 16. The sections 22, 24, 36 and 26 may be held in position by attaching circumferential sealing bars 60 and 95 by means of the bolts 74 associated therewith, the bolts not being completely tightened. This provides a semi-circular side wall having clamping bars held in position at all of its intermediate axially extending joints and at one of its axially extending edges and also clamping bars at its free circumferential edge except for the free circumferential or lower edge of the section 36. The clamping bar 103 (Fig. 8) associated with the free edge of the section 36 may, however, be held in position by clips 104, one of which is shown in Fig. 8 permanently attached to a clamping bar 72 in turn permanently attached to the side wall section 26. The clip 104 has a portion extending over the end of the clamping bar 103 and another clip 104 (not shown) permanently attached to a clamping bar 72 in turn permanently attached to the section 24 on the opposite side of section 36 and

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extending over the other end of clamping bar 103 holds the clamping bar in engagement with the flange 62 on the free edge of the section 36.

Similarly, the sections 26, 28, 32 and 20 may be assembled with the lower head section 18. This also provides a semi-circular side wall having clamping bars held in position at all of its intermediate axially extending joints and one axially extending edge, and also clamping bars held in position at its free circumferential edge except for the clamping bar 103 associated with the side wall section 32. This clamping bar may be held in position by clips 104 permanently attached to the clamping bars 72 in turn permanently attached to the free edges of the adjacent side wall sections 20 and 30.

The two half tank sections assembled as described in the preceding paragraphs may then be easily assembled to each other by relatively moving the half tank sections toward each other along a diametrical line so that the flanges 52 on the free circumferential edges of the upper and lower head sections engage in the grooves 76 of circumferential clamping bars carried by the free circumferential edges of the semi-circular walls. All of the clamping bars are held in position in the interior of the assembled tank either by being permanently attached to a head or side wall section or by the clips 104. The remaining sealing bars may then be applied and all of the bolts 74 tightened to force the edges of the return bent portions 54 and 64 of the flanges 52 and 62 into the sealing elements 70 and 94. The intersecting system of joints provides a completely closed system of communicating channels extending throughout the system of joints and the sealing elements 70 and 94 completely fill this system of communicating channels. Tightening of the bolts 74 places all of the sealing elements under pressure and causes them to flow together and into any voids which might be present in the system of channels so as to completely seal the tank against leakage.

As stated above, the only clamping bars not permanently secured to a side wall or head section are two clamping bars 103, one associated with the section 32 and the other associated with the section 36. These two bars are, however, held in position by the clips 104 secured to clamping bars permanently secured to the side wall sections 20 and 30 on the one hand and the side wall sections 24 and 26 on the other hand. The clamping bar 103 associated with the knock-out section 32 remains in position even though the knock-out section 32 is removed for rapid filling or emptying of the drum. It is convenient to have the sealing bars 90 and 95 surrounding the knock-out portion 32 secured to each other to form the square illustrated in Fig. 1 and this may be done in any suitable manner such as by tack welding.

When the drum is assembled in collapsed position, i. e., all of the side wall sections are removed from the head sections, the clamping bars 72 permanently secured to the head section 16 are in correct position to receive the flanges 52 of lower head section 18 and the clamping bars permanently secured to the head section 18 are in position to receive the flange 52 of the head section 16. These provide a complete circumferential ring of clamping bars for the drum in the collapsed condition, when the two head sections are assembled by a relative movement of the two head sections along a diametrical line. Circumferential sealing bars 60 and 90 may then be applied to provide a completely assembled collapsed drum. Again, all of the remaining parts may be positioned within the collapsed drum shown in Fig. 9. The collapsed drum of Fig. 9 may be disassembled at any time and reassembled in the form shown in Fig. 1 to provide a leak-proof container.

A modified type of sealing joint is illustrated in Fig. 11 and may be employed for any of the circumferential or axial joints instead of the sealing joint illustrated in Fig. 4. This joint may include the same type of clamping bar 72 and bolts 74 and may be employed to join side wall sections having the flanges 62 of Fig. 4 or

head sections having the flanges 52 to side wall sections. The sealing bar 104 may either be of extruded or cast metal instead of the roller sheet metal of the joint of Fig. 4. The sealing bar 104 may have edge flanges 106 received in the grooves of the flanges 62, the edge flange 106 having inwardly extending portions providing a partially closed channel 108 for receiving a sealing element 110. The sealing element 110 may be of larger cross-section than that shown in Fig. 4 and may rather loosely fit the channel 108. Clamping of the sealing bar 104 and clamping bar 72 by the belts 74 will, however, force the edges of the flanges 62 into the sealing element to expand the same and cause it to flow laterally and longitudinally into pressure transmitting engagement with the sealing elements of intersecting joints.

It will be appreciated that all of the joints of the drum of the present invention form a closed system of joints such that pressure is transmitted throughout the sealing elements, forcing them together and into sealing contact with the edges of the flanges of the various wall sections. It will also be appreciated that the actual stress transmission between the various wall elements is through the clamping bars 72 by direct engagement of the metallic surfaces of the flanges 62 or 52 with metallic surfaces of the clamping bars 72 and sealing bars 60 or 104.

The reinforcing tubes 80 secured to the lower surface of the lower head member form convenient receptacles for extensible handles 112, one of which is shown extended in Fig. 7. The handles 112 may have tubular body portions 114 snugly fitting the inside of the tubes 80, the tubular body portions 114 being approximately half the length of the tubes 80. As shown more clearly in Fig. 12, the body portion 114 may be provided at one end with a cap member 116 of approximately the same diameter as the tubes 80 and secured to the body portion in any suitable manner such as by the rivets 118. In order to prevent complete withdrawal of the handles 112, slotted bar members 120 secured at their centers to the centers of the tubes 80 in any suitable manner, such as by screw 122 (Fig. 13) may have their ends positioned within the body portions 114 of the handles and be provided with longitudinally extending slots 124. Rivets 126 extending through the inner ends of the body portions 114 of the handles may pass through the slots 124 and act as stop members by abutting against the ends of the slots. The slotted bar member 120 may be assembled with the handles 112 before the cap members 116 are applied to the handles. This assembly may then be inserted into the tube 80 and the slotted bar secured therein by the screw 122, after which the cap members 116 may be applied. The slotted bar members 120 may be expanded laterally of the slots 124 a sufficient amount to provide resiliency for frictionally retaining the handles against accidental projection from the tubes 80. The handles may, however, be pulled outwardly into the position shown in Fig. 7 so that the drum may be easily carried, even when filled.

The tubes 78 and 80 (Fig. 8) fit into the grooves 38 and 40, respectively (Fig. 3) when one of the drums is placed on top of another drum and properly oriented. Similarly, the tubes 86 (Fig. 8) fit over the reinforcing ring 55 (Fig. 3). It will be understood that the ends 84 (Fig. 7) of the tubes 78 also fit over the reinforcing ring 55 and that the cross-tubes 82 (Fig. 7) fit into the grooves 41 (Fig. 2). When one drum is thus superimposed on another drum and properly oriented, the upper drum is prevented from sliding laterally in any direction by the interfitting tubes and grooves.

As shown most clearly in Fig. 1, the channels 42 between the tubes 78 and 80 provide entrance portions for the forks of lift fork trucks even when the drum is on a floor or other supporting surface and this channel 42 in conjunction with a similar channel 42 on top of the drums provides an opening for the forks of lift fork trucks between any of the drums in a stack. As stated above, the channel shaped members 44 reinforce

the channels 42 of the drum against injury by the forks of such trucks. It will be apparent that one or a considerable number of drums, either in expanded or collapsed condition, may be handled in one load by a lift fork truck and also that the drums may be handled manually either by rolling or by carrying with the handles 112. The handles 112 are still available when the drum is in the collapsed condition illustrated in Fig. 9. Also the various clamping and sealing bars for the joints form reinforcing elements for the side walls of the drum when the drum is assembled in expanded condition.

The sealing elements employed in the drum of the present invention may be any flexible resilient material which will flow under pressure but has sufficient body to prevent escape through small openings which may occur in the closed system of channels and which is inert to the material contained in the drum. A resilient vulcanized rubber has the correct physical properties. Oil-resistant synthetic rubbers, such as neoprene, are particularly useful when the drums are to be employed for shipping vegetable, animal or mineral oils and for other materials being shipped various synthetic rubbers or mixtures thereof or with natural rubber may be employed. In any event, it will be clear from Fig. 4 that the contents of the drum has little or no contact with the sealing element 70 as the clamping contact between the clamping bars such as the clamping bar 72 and the flanges 52 and 62 also provides an effective seal.

While the drum of the present invention is preferably collapsible so as to enable its shipment in collapsed condition, when empty, it is apparent that the reinforced head sections providing openings for the forks of lift fork trucks as well as the general form of the drum and the handles for efficient manual carrying of the drum, have utility even in a drum having a continuous side wall permanently secured to the head sections in any suitable manner known to the art. Such non-collapsible drum may, however, be provided with a knock-out side wall section such as section 32 of Fig. 1 by attaching suitable clamping bars to the edges of the wall and head sections surrounding said knock-out section.

What is claimed is:

1. A container structure comprising a cylindrical side wall structure, substantially circular imperforate end wall structures secured to the ends of said side wall structure to provide a closed container, said end wall structures having channel portions formed therein and extending thereacross in a direction parallel to a diameter thereof, said channel portions reinforcing said end wall structures and being of sufficient depth and width to receive lifting elements inserted beneath said container when said container is positioned on a supporting surface with one of its end wall structures in contact with said surface, said end wall structures having grooves formed therein and extending along the edges of said channel portions, reinforcing elements secured in said grooves of one of said end wall structures, said reinforcing elements extending longitudinally of said grooves and having portions projecting from the surface of said one end wall structure, the projecting portions of said reinforcing elements registering with and extending into said grooves of the other end wall structure of another said container structure when two of said container structures are superimposed with said end wall structures in contact to interlock said superimposed container structures.

2. A container structure comprising a side wall structure, end wall structures secured to the ends of said side wall structure to provide a closed container, said end wall structures each having a plurality of grooves formed therein, reinforcing elements secured in said grooves of one of said end wall structures, said reinforcing elements extending longitudinally of said grooves and having portions projecting from the surface of said one end wall structure, the projecting portions of said reinforcing elements registering with and extending into said grooves of

the other end wall structure of another said container structure when two of said container structures are superimposed with said end wall structures in contact to interlock said superimposed container structures, certain of said grooves and reinforcing elements extending rectilinearly entirely across said end wall structures, said reinforcing elements extending entirely across said end wall structure being tubular and having handle members slidably positioned therein.

3. A container structure comprising a side wall structure, end wall structures secured to the ends of said side wall structure to provide a closed container, said end wall structures each having a plurality of grooves formed therein, reinforcing elements secured in said grooves of one of said end wall structures, said reinforcing elements extending longitudinally of said grooves and having portions projecting from the surface of said one end wall structure, the projecting portions of said reinforcing elements registering with and extending into said grooves of the other end wall structure of another said container structure when two of said container structures are superimposed with said end wall structures in contact to interlock said superimposed container structures, certain of said grooves and reinforcing elements extending at an angle to other of said grooves and reinforcing elements, said reinforcing elements being tubular and round in cross-section and said grooves being substantially semicircular in cross-section, each of said end wall structures being substantially circular and being substantially greater in diameter than the axial length of said side wall structure and having a reinforcing ring secured to its peripheral edge, said reinforcing rings projecting radially from said container to provide roller rings for said container and being axially displaced from said reinforcing elements in a direction inwardly of the ends of said container.

4. A container comprising, a generally cylindrical side wall structure, generally circular end wall structures secured to the ends of said side wall structure to define a closed container, said end wall structures having spaced ribs formed thereon and extending thereacross in a direction parallel to a diameter thereof, said ribs defining open-ended channels therebetween of sufficient depth and width to receive lifting elements inserted beneath said container when said container is positioned on a supporting surface with one of its end wall structures in

contact with said surface, the crest portions of the ribs on one of said end wall structures having concave channels formed therein, the crest portions of the ribs on the other end wall structure being of convex shape substantially complementary to said concave channels whereby a plurality of said containers may be stacked, one upon the other, with said convex rib crests on one mating with the convex channels of another to lock said containers against relative lateral displacement and with said open-ended channels being open for the reception of lifting elements.

5. A container as defined in claim 4 wherein the diameter thereof is substantially greater than the axial length thereof.

6. A container as defined in claim 4 wherein said end wall structures are substantially greater in diameter than the axial length of said side wall structure and each being provided with a reinforcing ring at its peripheral edge, said reinforcing rings projecting radially from said container to define roller rings therefor and being axially displaced from the ends of said ribs in a direction inwardly of the ends of said container.

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