The invention herein disclosed relates to containers in the nature of wing tip auxiliary fuel tanks.

Objects of the invention are to provide containers of this type sectioned so as to be compactly nestable and so constructed as to be quickly and easily assembled in sealed, liquid-tight engagement.

Special objects of the invention are to provide such structure in a mechanically simple, practical form requiring a minimum of time and talent for assembly.

Other special objects of the invention are to keep the number of parts to a minimum and to assure all necessary strength in a fully streamlined, light-weight structure.

Other desirable objects and the novel features of construction, combination and relation of parts through which the purposes of the invention are attained are set forth and will appear in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate a present commercial embodiment of the invention but structure may be modified and changed as regards such illustration, all within the true intent and scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a plan view of a wing tank incorporating features of the invention;

Fig. 2 is an enlarged broken sectional detail of one of the transverse sealed joints between intermediate and end sections of the tank, this view being taken as on line 2—2 of Fig. 5;

Fig. 3 is a broken sectional detail of the longitudinal joint and seal of the intermediate tank section, this view being taken as on substantially the plane of line 3—3 of Fig. 5;

Fig. 4 is a broken sectional and part plan view of the longitudinal seam construction as taken on substantially the plane of line 4—4 of Fig. 3, but turned about 90°;

Fig. 5 is an enlarged broken horizontal sectional view as on line 5—5 of Fig. 1;

Fig. 6 is a broken part plan view of the longitudinal seam closing lever and lock pin;

Fig. 7 is a sectional view of the same as on substantially the plane of line 7—7 of Fig. 6;

Fig. 8 is a broken plan showing the lever released and the companion parts of the longitudinal seam in separated, open relation;

Fig. 9 is a broken sectional view of these parts in the same open relation;

Fig. 10 is a cross-sectional view of the tank, larger scale, as on the plane of line 10—10 of Fig. 5;

Fig. 11 is an enlarged broken sectional view as on the plane of line 11—11 of Fig. 5;

The tank shown is made up of conically tapered nose and tail end sections 15, 16, joined to opposite ends of a generally cylindrical intermediate section 17.

The conical end sections can be closely packed in telescoped relation. To enable complete nesting of all parts the intermediate cylindrical section is split longitudinally, enabling it and a number of other mid-sections to be closely rolled about a number of nested end sections, and thus all to form a compact package containing all parts of one or a number of the tanks.

Details of the longitudinal seam for the intermediate section are shown particularly in Figs. 6, 7, 8 and 9 as comprising an external, beveled, undercut rib 18 along one edge of the skin forming the mid-section and a correspondingly beveled, undercut hook 19 on the opposite edge with an internally located seam closing lever 20 pivoted at 21 on a rib 22 extending along one edge, carrying a flange 23 to wedgingly engage over a companion flange 24 on the opposite, hooked edge.

The pivotal mounting rib 23 for the lever on one edge and the flange 24 on the opposite edge provide backing seats for the longitudinal strip packing 25 which overlies the joint and may be secured in that relation by the lever when closed, as in Fig. 7.

To lock the lever in the joint-sealing and seam-sealing relation, lock pins are provided as shown at 26, extended through mounting lugs 27 on the inside of the skin adjoining flange 24 and having hairpin ends 28 which can be engaged over the free ends of the levers when these pins are pushed into final securing position in the pairs of spaced mounting lugs 27.

Fig. 5 shows how the locking and sealing lever 20 extends the full length of the longitudinal seam, with projecting tabs 29 at intervals extending between the pairs of lugs 27 for engagement by the lock pins 26, 28.

With the lever thrown open as in Fig. 9, the hook 19 extending along one edge may be engaged over the undercut rib 18 on the opposite edge of the skin and the lever then swung closed as in Fig. 7, to engage flange 23 on the lever over flange 24 on the hooked portion, to lock the parts against separation and to compress the packing 25 over the meeting edges of the joint, the lever then being secured by lock pin 26.

Reverse operations release the lever and permit opening of the joint.

Both operations are simple and quickly effected and in the closed relation the parts are held positively mechanically interlocked and sealed. Internal pressure is effective to keep the joint more firmly closed and the structure is fully braced against external pressure.

The packing strip is held under continuous, constant compression by the lever, keeping the joint vibration-proof and shake-proof.

The transverse joints between the end and intermediate sections are shown in Figs. 2 and 5 as made and sealed by internal rings 30 overlapping opposed abutting ends of the sections, centrally grooved at 31 to contain and hold O-rings 32 in place over the abutting edges and secured by O-ring packed self-sealing bolts 33 extended through the skin and ring into engagement with nut formations 34 at the inner side of the ring.

Bolts 33 are indicated as of tapered, self-sealing, flush-head construction.

The longitudinal seam packing 25 and transverse packing rings 32 may be integrally connected as indicated in broken lines in Fig. 5, thus to form a single, easily applied "harness" which will seal all the seams.

The longitudinally split intermediate section is shaped and held in true circular formation by bulkhead spreaders in the form of split rings disposed with the split over the longitudinal joint, Figs. 10 and 11, and consisting in each instance of a pair of channel cross-section rings 35, 36, Figs. 4 and 5, connected at the ends by spacing yokes 37 having opposed wedge inclines 38, 39 at opposite sides of the spreader engaged by opposing wedges 40, 41.

The companion wedges 40, 41 are drawn together as shown in Fig. 4, by bolts and nuts 42, 43. Plates 44 are shown secured over the tops of the wedges, extending over
3. the upper edges of the yokes 37 to prevent the wedges, when loose, from dropping down out of position between the yokes.

Figs. 3 and 4 show how the wedge yokes may be secured in spacing position between the rings of each spreader or through bolts 45 surrounded by spacer sleeves 46, interposed between the spaced sides or arms of the yokes.

The spaced channel section rings make extended surface engagement with the skin and can apply force required to expand and tension the skin in true circular shape without deformation, and the pressure applied is equally divided among the rings of each pair by the oppositely acting spacer wedges interposed between the ends of the split rings. In this skin tensioning operation the bulkhead spreaders serve further to lock the longitudinal joint of the intermediate section.

Tanks constructed as disclosed consist of but few parts, of simple construction, and these are all readily assembled with no requirement for special skill. In the collapsed state the parts can be nested in close-fitting, compact relation for shipment or storage.

The lever for holding the longitudinal sealing strip in place, by wedging engagement of flange 23 over the flange 24, holds this joint closed at the inside and is positioned to exert the pull exerted by the hook engaged elements at the outside of the joint, making this joint particularly strong and secure and free of off-center strain which might weaken the joint.

The transverse rings or bands 30 for securing and sealing the ends and sections of the intermediate section, by overlapping and being secured to the split intermediate section as well as the continuously circular end sections, serve to further strengthen and reinforce the split section.

What is claimed is:

1. High nesting sectional fuel tank comprising the combination of a longitudinally split intermediate and tapered end sections joined in end-to-end relation, the opposite edges of said longitudinally split intermediate section having external companion hook engaging elements for securing said section in generally cylindrical form, a longitudinally extending sealing strip overlying said joint at the inside of the section, a lever hinged on the edge portion of the section at one side of said joint and extending over said joint at the other side of the joint, means on said other side of the joint for securing said lever in position holding said packing over the joint, internal coupling rings overlapping opposing end portions of the intermediate and end sections, said rings having annular grooves therein in line with the meeting ends of the intermediate and end sections, packing rings in said grooves in sealing engagement with said meeting ends and externally accessible screw means securing said coupling rings in position.

2. High nesting sectional fuel tank comprising the combination of a longitudinally split intermediate and tapered end sections joined in end-to-end relation, the opposite edges of said longitudinally split intermediate section having external companion hook engaging elements for securing said section in generally cylindrical form, a longitudinally extending sealing strip overlying said joint at the inside of the section, a lever hinged on the edge portion of the section at one side of said joint and extending over said joint at the other side of the joint, means on said other side of the joint for securing said lever in position holding said packing over the joint, internal coupling rings overlapping opposing end portions of the intermediate and end sections, said rings having annular grooves therein in line with the meeting ends of the intermediate and end sections, packing rings in said grooves in sealing engagement with said meeting ends and externally accessible screw means securing said coupling rings in position, said longitudinal packing and said packing rings being integrally connected in the form of a harness engaged over the meeting edges of the split intermediate section and between the ends of said intermediate section and said end sections.

3. High nesting sectional fuel tank comprising the combination of a longitudinally split intermediate and tapered end sections joined in end-to-end relation, the opposite edges of said longitudinally split intermediate section having external companion hook engaging elements for securing said section in generally cylindrical form, a longitudinally extending sealing strip overlying said joint at the inside of the section, a lever hinged on the edge portion of the section at one side of said joint and extending over said joint, said joint, means on said other side of the joint for securing said lever in position holding said packing over the joint, internal coupling rings overlapping opposing end portions of the intermediate and end sections, said rings having annular grooves therein in line with the meeting ends of the intermediate and end sections, packing rings in said grooves in sealing engagement with said meeting ends and externally accessible screw means securing said coupling rings in position, said longitudinal packing and said packing rings being integrally connected in the form of a harness engaged over the meeting edges of the split intermediate section and between the ends of said intermediate section and said end sections.
and extending over said packing to the other side of the joint, means on said other side of the joint for securing said lever in position holding said packing over the joint, internal coupling rings overlapping opposing end portions of the intermediate and end sections, said rings having annular grooves therein in line with the meeting ends of the intermediate and end sections, packing rings in said grooves in sealing engagement with said meeting ends and externally accessible screw means securing said coupling rings in position, the opposing edge portions of the longitudinal joint having oppositely disposed flanges receiving between them the longitudinal packing and said lever arranged to overlie and hold the packing in compression between said flanges, and a flange on the lever positioned for wedging engagement over the flange on said other edge portion.

7. High nesting sectional fuel tank comprising a split intermediate tank section and end sections, companion hook elements along the edges of the split intermediate section, a packing strip covering the joint between said companion hook elements at the inside of said section, a lever pivoted on the section at one side of the joint at the inside of the tank and overlying said packing, companion wedge elements on said lever and on the section at the other side of said joint and means for securing said lever in holding position over said packing.

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