O. W. MALONEY.

KNOCKDOWN OIL TANK.

APPLICATION FILED JUNE 29, 1912.

1,076,382. Patented Oct. 21, 1913.

Fig. 1.

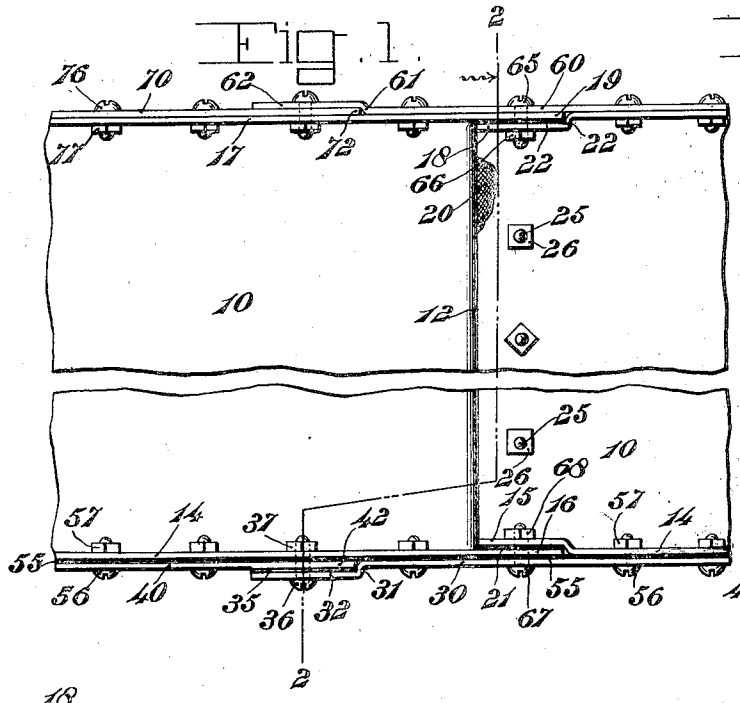


Fig. 2.

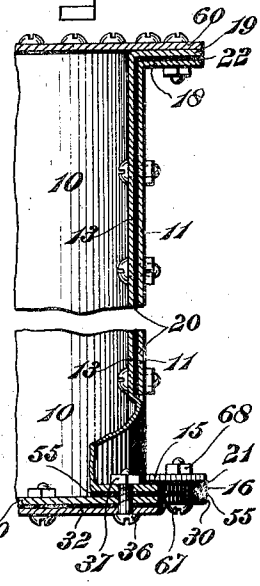


Fig. 3.

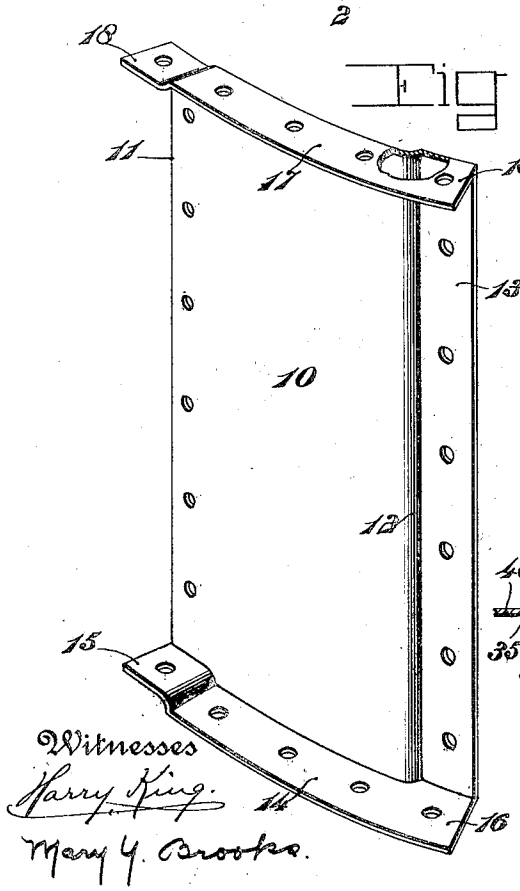


Fig. 4.

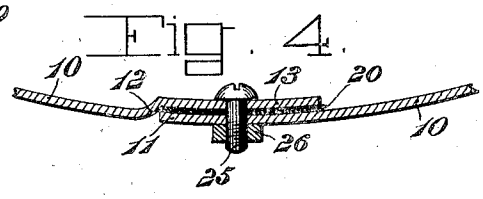
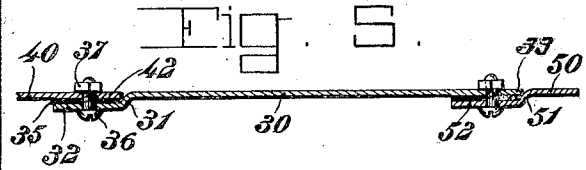


Fig. 5.



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KNOCKDOWN OIL-TANK.

1,076,382. Specification of Letters Patent. Patented Oct. 21, 1913.

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To all whom it may concern:

Be it known that I, OWEN WINN MALONEY, a citizen of the United States of America, and a resident of Tulsa, in the county of Tulsa and State of Oklahoma, have invented certain new and useful Improvements in Knockdown Oil-Tanks, whereof the following is a specification.

Oil tanks used for the storage of crude petroleum as it comes from the wells have capacities ranging from a few hundreds or thousands to fifty thousand barrels of oil.

This invention relates to knockdown tanks for this purpose which may be constructed in sections and transported in shook form.

The object of the invention is to provide a strong durable tank of this character which can be readily set up and joints made tight by unskilled workmen.

Figure 1 of the accompanying drawings represents a side elevation with parts broken out of one embodiment of this invention. Fig. 2 represents a vertical section of a fragment of the tank on line 2—2 of Fig. 1, showing the joint between the side wall and bottom plates. Fig. 3 represents a perspective view with a part broken out of one of the side plates constituting a section of the side wall of the tank. Fig. 4 represents on an enlarged scale a horizontal section through one of the joints of the side wall plates. Fig. 5 represents on an enlarged scale a vertical section of a portion of the bottom of the tank showing the joints between the bottom plates.

The same reference numbers indicate corresponding parts in the different figures, round numbers being used for the principal elements and intermediate numbers for the subordinate features thereof.

This tank is constructed of sheet steel or other suitable metal in sections adapted to form a shook of convenient size for transportation.

The tank is preferably constructed in cylindrical form and the side walls or body thereof comprise a circular series of similar sectional plates 10. Each of the plates 10 is formed from a blank, which is cut and punched from sheet steel, sheet iron or other suitable material. The blank is then rolled into arc-shape form and flanged as indicated in Fig. 3. The plate 10 thus formed is plain on one vertical edge 11 and at the other vertical edge the said plate is provided with an angle-flange whereof the web 12 curves inward approximately at right angles to the body of the plate and the web 13 extends from the inner edge of the web 12 beyond the body of said plate in a plane approximately parallel or concentric therewith. The web 12 is of greater depth than the thickness of the plate and the web 13 is preferably broader than the depth of the web 12 and constitutes a seat and underlapping lip for the plain edge of the corresponding adjacent plate 10 when the parts are assembled. The plate 10 is provided at its lower edge with an outward horizontal bottom flange 14 which extends along the bottom of the plate 10 from the vertical edge 11 thereof to the outer vertical edge of the web 13. This flange 14 has at one side a swaged-up portion which constitutes an overlapping lip 15 and at the other end a broad straight extension 16. The lip 15 is swaged up from the flange 14 and the body of the plate 10 adjacent to the vertical edge 11 thereof. The broad straight extension 16 is in the same plane with the body of the flange 14 at the bottom of the vertical web 13. The lip 15 is disposed above the plane flange 14 a greater distance than the thickness of the metal and overlaps the extension 16 of an adjacent plate together with an interposed packing. A horizontal top flange 17 extends along the top of the plate 10 from the vertical edge 11 thereof to the outer vertical edge of the web 13. This top flange has at one end a down-swaged portion which forms an underlapping lip 18 and at the other end a broad straight extension 19. The lip 18 is swaged downward from the flange 17 and from the body of the plate 10 adjacent to the vertical edge 11 thereof. The broad straight extension 19 is in the same plane with the body of the flange 17 and integral with the web 13 at the top thereof. The lip 18 underlaps the straight extension 19 of an adjacent plate 10 together with an intermediate packing. The plain edge 11 of the plate 10, the web 13 thereof, the bottom flange 14, its lip 15 and extension 16, the top flange 17, its lip 18 and extension 19, are all provided with bolt holes at proper distances apart for securing tight joints.

Packing strips 20 composed of lead, rubber or any other packing material suitable for the tank and its contents are disposed between the lips 13 of the several plates 10 and the plain edges 11 of adjacent plates. Each strip 20 is provided at its lower end with an outturned extension 21 which lies between the broad extension 16 of the flange 14 of one plate 10 and the overlapping lip 15 of a corresponding flange of an adjacent plate 10. This strip is also provided at its upper end with an outturned extension 22 which lies between the broad extension 19 and the underlapping lip 18 of an adjacent plate 10.

Detachable bolts or screws 25 provided with nuts 26 form separable joints between the plates and clamp the packings between them as shown in Fig. 4.

The bottom of the tank comprises a central bottom plate 30 and two segmental plates 40 and 50 disposed at opposite sides of said central plate and forming therewith a disk equal in diameter to the diameter of the tank plus the outward flange 14 at the bottom thereof.

The central approximately rectangular bottom plate 30 is rounded at its opposite ends to conform to the curvature of said bottom flange. This plate is provided on one straight edge with an outward angle-flange 31—32 similar to the angle-flange of the plates 10. The first web 31 of this bottom plate angle-flange is of greater depth than the thickness of the plate and the second web 32 extends beyond the body of the plate in a plane approximately parallel therewith and constitutes an underlapping lip for the inner plain edge 42 of the plate 40. The opposite straight edge 33 of the plate 30 is plain. This plate is provided along its opposite arc-shaped ends, along its lip 32 and along its edge 33 with bolt holes disposed a proper distance apart for effecting a tight separable joint.

The segmental bottom plate 40 is provided along its arc-shaped edge 41 which fits the bottom flange 14, with bolt holes registering with the bolt holes in said flange and also along its straight side 42 with bolt holes registering with the bolt holes in the lip 32 of the plate 30.

The segmental plate 50 is provided on its straight edge with an angle-flange 51—52. The first web 51 of this angle flange is of greater depth than the thickness of the plate and the second web 52 extends beyond the body of the plate in a plane approximately parallel therewith and constitutes an underlapping lip for the plain edge 33 of the central plate 30. This segmental plate 50 is provided along its lip 52 with bolt holes registering with the bolt holes in the plain edge 33 of the plate 30 and along its arc-shaped edge 53 which fits the bottom flange 14 with bolt holes registering with the bolt holes in said flange.

Transverse packing strips 35 are disposed in the recesses of the plates 30 and 40 over the lips 32 and 52 between said lips and the plain edges of the plates 40 and 30 so as to leave sufficient space in said recesses for the plain edges of said plates 40 and 30 to abut against the flanged edges of said plates 30 and 50. Bolts 36 are passed through the overlapping plates and intermediate packings and nuts 37 serve to clamp the parts of the bottom together and effect tight separable joints.

The top of the tank is of similar construction to the bottom thereof and comprises a central top plate 60, a segmental plate 70 and another segmental plate not shown, said segmental plates being disposed at opposite sides of said central plate and forming therewith a disk equal in diameter to the diameter of the tank plus the outward flange 17 at the top thereof. The central approximately rectangular top plate 60 is arc-shaped at its opposite ends to conform to the curvature of said top flange. This plate is provided on one straight edge with an upward angle-flange 61—62. The first web 61 of this top plate angle-flange is preferably of a depth corresponding with the thickness of the plate and the second web 62 extends beyond the body of the plate in a plane approximately parallel therewith and constitutes an overlapping lip for the inner plain edge 72 of the segmental plate 70. The margins of the plates including the overlapping lips are provided with registering bolt holes. Bolts 65 having nuts 66 clamp the members of the top together and the top to the flanges 17 and bolts 67 having nuts 68 clamp together the extension 16, lip 15, angle-end 21 of packing 20 and the bottom of the tank. The joint between the plate 60 at the right straight plain edge thereof and the lipped edge of the right segmental plate not shown is similar to the joint just described.

The means for connecting the body of the tank with the bottom thereof to effect tight joints comprise an annular packing ring 55 and a series of bolts 56 provided with nuts 57. The annular packing ring is of the same circumference as the flange 14 of the body.

The means for connecting the body of the tank with the top thereof to effect a tight joint comprise a series of bolts 76 provided with nuts 77.

The parts described are constructed at the factory in a compact shook for transportation.

In assembling the parts at the "tank farm" the body is formed by placing together a sufficient number of overlapping plates 10 to complete the cylindrical body with packings in the joints and clamping

said parts together by means of bolts 25 passed through from either side as shown in Fig. 4. The plates 30, 40 and 50 are united to form the bottom by passing the bolts 36 through the overlapping edges thereof and through the intermediate packings 35 as indicated in Fig. 5. Then the bottom is separably secured to the body by bolts 45 which are passed through said bottom around the circumference thereof through the flange 14 and through the intermediate annular packing ring 55 between said flange and bottom.

The top is secured to the top flange 17 of the body by means of bolts 65 in a manner similar to the securing of the bottom to the bottom flange.

This tank is simple in construction, will take up very little space in shipping, can be readily put together by a person of ordinary intelligence, has flat joints and is strong and durable.

The overlapping lips of the bottom and top flanges of the body plates, which lips are swaged from said flanges and from the body of said plates, constitute firm, strong and tight joints.

I claim as my invention:

1. A knockdown metallic tank comprising a cylindrical body composed of a plurality of separable plates, each plate overlapping at its opposite edges two adjacent plates, said plates having outward horizontal flanges, a flange of each plate overlapping at its opposite ends the flanges of the two adjacent plates, one end of each horizontal flange having a lip swaged vertically beyond the lapping adjacent flange and forming a space between them, said overlapping edges and flanges being provided with bolt holes, packings disposed between said overlapping edges and overlapping flanges, and clamping bolts uniting said parts.

2. A knockdown metallic tank comprising a cylindrical body composed of a plurality of separable plates, each plate overlapping at its opposite edges two adjacent plates, said plates having outward horizontal flanges, a flange of each plate overlapping at its opposite ends the flanges of the two adjacent plates, one end of each horizontal flange having a lip swaged vertically beyond the lapping adjacent flange and forming a space between them, said overlapping edges and flanges being provided with bolt holes, packings disposed between said overlapping edges and overlapping flanges, a bottom having a peripheral extension underlying said outward horizontal flanges, a packing ring disposed between said peripheral extension of the bottom and said horizontal flanges, and clamping bolts uniting said parts.

3. A knockdown metallic tank comprising a cylindrical body composed of separable plates disposed edge to edge and having respectively plain and angle-flange edges, the latter forming extension lips overlapping the adjacent plain edges and outward horizontal flanges at their bottom edges, the flanges having broadened extensions at the flanged edges of said plates and lips at the plain edges thereof which overlap said extensions, packings between said plates, means for detachably clamping said plates and packings, a bottom having a peripheral extension underlying said outward horizontal flanges, an annular packing disposed between said peripheral extension and said horizontal flanges, and means for detachably clamping said bottom, packing and flanges.

4. A knockdown metallic tank comprising a cylindrical body composed of separable plates having respectively plain and angle-flange edges, the latter forming extension lips overlapping the adjacent plain edges and outward horizontal flanges at their bottom edges, said flanges having broadened extensions at the flanged edges of said plates and lips at the plain edges thereof which overlap said extension, and means for detachably clamping said plates.

5. A body member for a knockdown tank consisting of a metallic plate having a plain side edge provided with bolt holes adjacent thereto, an angle-flange at the other side edge comprising an inward web of greater depth than the thickness of the sheet and an extended lip provided with bolt holes, and a horizontal end flange provided with bolt holes and having a swaged lip adjacent to said plain side edge and a straight extension adjacent to said angle-flange.

6. A body member for a knockdown tank consisting of a metallic plate having a plain side edge provided with bolt holes adjacent thereto, an angle-flange at the other side edge comprising an inward web of greater depth than the thickness of the sheet and an extended lip provided with bolt holes, and horizontal flanges at both ends of said plate provided with bolt holes and having swaged lips adjacent to said plain side edge and straight extensions adjacent to said angle-flange.

7. A knockdown metallic tank comprising a cylindrical body composed of separable plates disposed edge to edge and having respectively plain and angle-flanges the latter forming extension lips overlapping the adjacent plain edges and outward horizontal flanges at their bottom edges, the flanges having broadened extensions at the flanged edges of said plates and lips at the plain edges thereof which overlap said extensions, packings disposed between the flanged and plain edges of said plates and having outward extensions between the

broad extensions and lips of the bottom and top flanges, means for detachably clamping said plates and packings, a bottom having a peripheral extension underlying said outward horizontal flanges, an annular packing disposed between said peripheral extension and said horizontal flanges, and means for detachably clamping said bottom, packing and flanges.

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