June 21, 1938. H. G. BEEDE 2,120,961

TANK COVER CONSTRUCTION

Filed Jan. 15, 1937 2 Sheets-Sheet 1

Fig. 1.

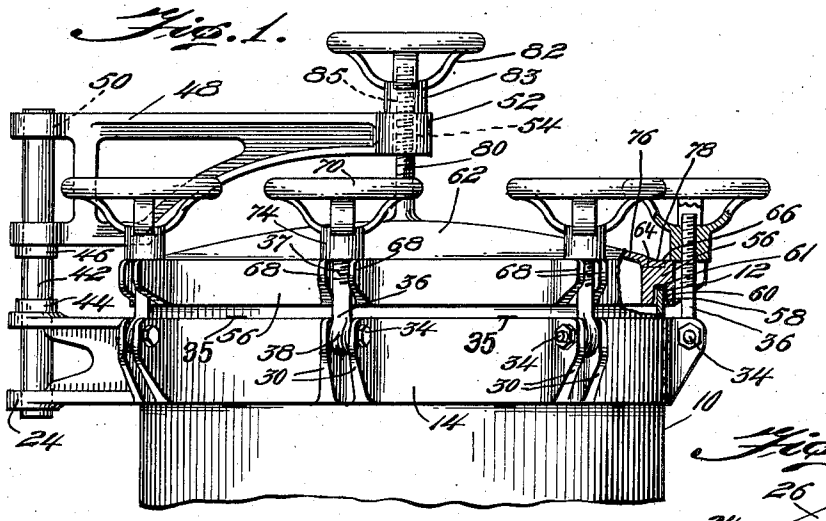


Fig. 3.

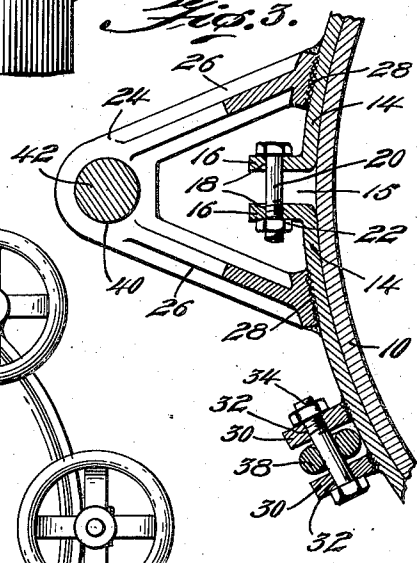
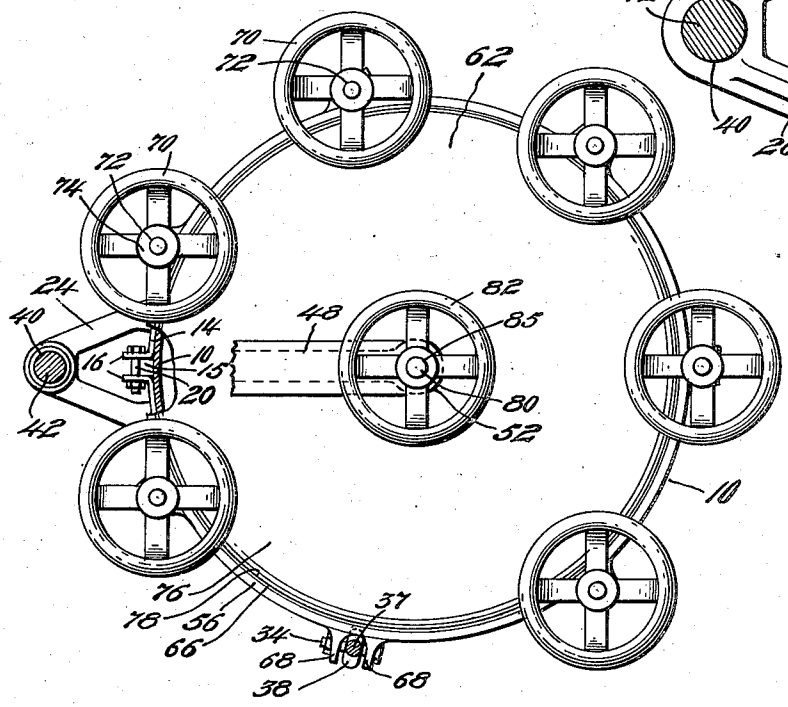


Fig. 2.



Inventor
Herbert G. Beede
By Thomas A. Jenkes
Attorney

June 21, 1938. H. G. BEEDE 2,120,961

TANK COVER CONSTRUCTION

Filed Jan. 15, 1937 2 Sheets-Sheet 2

Fig. 4.

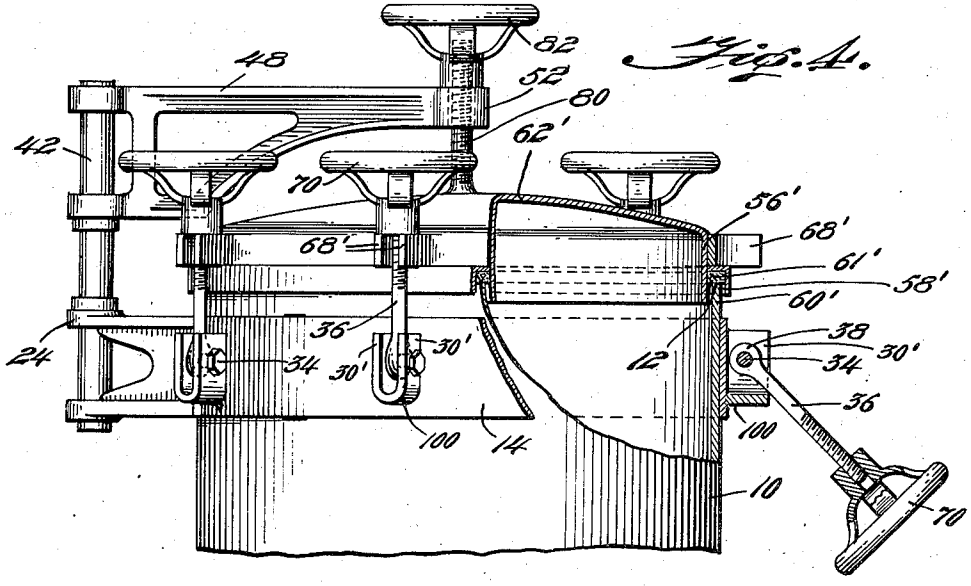


Fig. 5.

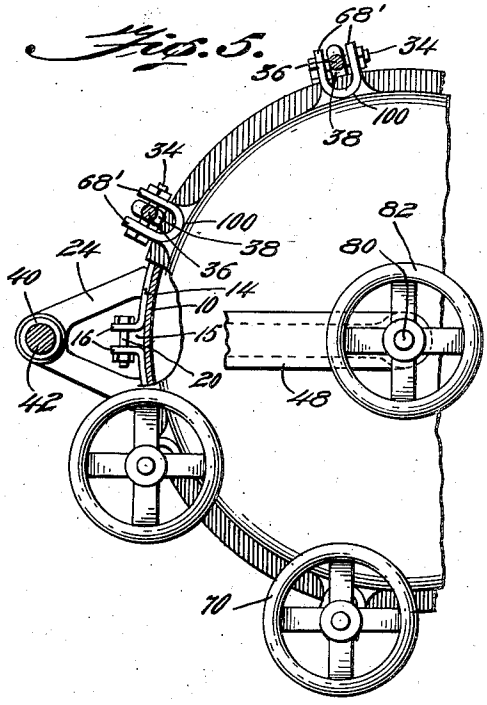


Fig. 6.

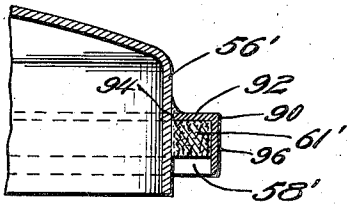
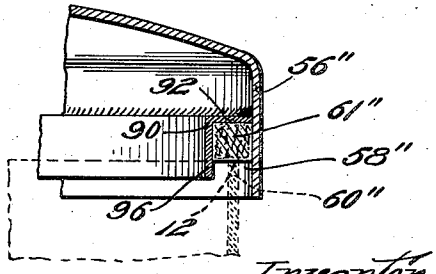


Fig. 7.



Inventor
Herbert G. Beede
By Thomas A. Jenckes
Attorney

Patented June 21, 1938 2,120,961

UNITED STATES PATENT OFFICE

2,120,961

TANK COVER CONSTRUCTION

Herbert G. Beede, Pawtucket, R. I.

Application January 15, 1937, Serial No. 120,778

6 Claims. (Cl. 220—55)

My invention relates to improvements in tank cover constructions of the type employed in small filtration tanks for use in the recovery of solvent for cleaning clothes or other purposes and includes a novel type of cover structure, novel means to tightly clamp the cover to the tank and a novel type of crane means to raise and pivot the cover away from the tank and in which the various cooperating parts of my improved construction are fabricated to provide a structure wherein certain parts thereof will perform double functions.

A further object of my invention is to provide a novel type of tank cover construction including split strap means for surrounding the upper portion of the tank which may be tightly adjustably clamped around the tank and then positively locked in clamped position by a locking bracket having legs bridging the split in the strap means, which locking bracket may also function as a support both for the tank top and for the crane for raising and pivoting of the cover away from the tank.

A further object of my invention is to provide a novel type of tank cover, carrying packing or gasket means to tightly abut the tank top to prevent leakage at all points, in one embodiment of my invention comprising a two-piece construction, namely, a cover ring and a cover disc and in another embodiment of my invention comprising a pressed metal cover having an integral downwardly projecting side wall which may be readily pressed from metal in one piece and having a rolled angle metal ring having a horizontal wall having an end thereof welded to the downwardly projecting wall of said cover and an integral wall projecting downwardly from the other end thereof forming an annular socket with said downwardly projecting cover wall for containing an annular packing ring contained within said annular socket to abut and seal the upper end of the tank.

A further object of my invention relates to the specific construction of the pairs of cover clamp lugs, each pair of lugs comprising a U-shaped metal stamping which may either have the side wall thereof welded to the tank strap or the U-base thereof welded to the downwardly projecting cover wall.

Further features of my invention relate to the provision of a construction for accomplishing these purposes having relatively few parts and one in which the various locking members thereof may be more easily attached to such parts as the cover, cover ring and strap than was formerly the case where the clamping parts were individually attached to the tank or milled into the cover.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of embodiments in use on a small solvent recovery filtration tank such as shown in the accompanying drawings.

In the drawings, Fig. 1 is a side elevation of the top of such a filtration tank with my invention attached, a portion of the cover thereof and adjacent tank portion being broken away and shown in section.

Fig. 2 is a plan view of the tank equipped with my invention shown in Fig. 1 with a portion of the crane arm and cover also broken away.

Fig. 3 is a horizontal sectional view taken through one edge of the tank illustrating the tank strap in adjustably tightened position and the supporting bracket for the cover crane supplementally functioning as a lock to rigidly secure the strap in position around the tank top.

Fig. 4 is a side elevation of the top of a filtration tank generally similar to Fig. 1 with a different embodiment of my invention attached, a portion of the cover thereof and adjacent tank portion being broken away and shown in section.

Fig. 5 is a fragmentary plan view of a tank equipped with the embodiment of my invention shown in Fig. 4 and also having a portion of the crane and cover arm broken away.

Fig. 6 is a detailed sectional view taken through one edge of the cover to illustrate the embodiment of the tank top sealing means shown in Fig. 4.

Fig. 7 is a sectional view of a portion of the tank top shown in Fig. 4 with the diameter of the cover greater than that of the tank top to permit the attachment of the free end of the horizontal upper wall of the rolled annular metal ring to the interior of the integral downwardly projecting side wall of said cover instead of the exterior as in the embodiment shown in Figs. 4–6.

In the drawings, wherein like characters of reference generally indicate like parts throughout, 10 generally indicates a suitable tank provided with the open top 12 and as stated I have illustrated my invention applied to a type of tank used for solvent filtration although it is obvious that my invention may be applied for use on other types of tanks.

To rigidly reenforce the top of the tank and to provide means for holding the lower cover clamping means, I provide a split tank strap 14 surrounding the upper end of the tank, which in my

preferred embodiment also functions as a cover bracket strap in a manner to be explained and in my preferred embodiment has the ends thereof bent radially outwardly as at 16 into vertical lips provided with aligned holes 18 therein. While any type of means on said strap may be provided to adjustably tighten said strap 14 around said strap, I provide bolt means 20 extending through said aligned lip holes 18 and provided with the nut 22 for adjustably tightening said strap 14 around said tank. In order to supplementally and positively retain the strap in tightened position to withstand the pressure within the tank, I provide a supplemental locking bracket 24 having legs 26 bridging the split 15 in said strap 14 terminating in ends 28 welded to opposite end portions of said strap 14 after tightening thereof by means of the adjustable tightening means 20—22. In order that the tank strap 14 may positively reenforce the upper portion of the tank 10 against the pressure from within when in operation, the tank strap 14 is preferably supplementally positioned at the top of the tank 10 by spaced circumferential welds 35 at the top edge thereof, the welds 35 being preferably applied after the strap has been clamped in position as explained. The welds 35 also function to prevent axial slippage of the strap, and maintain it in its desired position at the top of the tank.

It is also desirable to provide means to tightly clamp the cover to the tank and the lower portions of such means have been either mounted directly on the tank or on some special means for this purpose and in my preferred embodiment, I preferably mount the lower portions of said clamping means at spaced intervals on said strap 14, said portions comprising in my preferred embodiment substantially equally spaced pairs of cover clamp lugs 30 projecting radially from said strap at substantially equally spaced distances therefrom, each pair of lugs having the aligned horizontal holes 32 therein and pivot rods 34 rigidly mounted in said holes having the threaded cover bolts 36 suitably pivotally mounted thereon, such as by providing said threaded cover bolts with the looped heads or eyes 38 for loosely mounting on said pivot rods. The threaded cover bolts 36 are preferably of less diameter than the spacings between the lugs 30 of each pair and the cover bolts 36 are preferably loosely mounted on said pivot rods 34 to slide to provide a tolerance for the tightening of the strap 14 around the tank cover.

As stated hitherto, it is desirable to provide some means to lift the cover from the tank and pivot it out of the way, and I have provided for this purpose the type of crane means shown and for this purpose the locking bracket 24 is provided with a vertical bearing bore 40 in the outer end thereof and a cover pivot rod 42 is vertically mounted in said bore 40 and provided with a collar or integral annular enlargement 44 of larger diameter abutting a portion of said bracket 24 to retain said cover pivot rod in position. The cover pivot rod 42 is also preferably provided with a cover pivot arm collar or integral annular enlargement 46 mounted thereon at a spaced distance above said cover 44 and above said tank. A cover pivot arm 48 is also provided having a vertical bearing bore 50 in the outer end thereof for mounting on said cover pivot rod 42 and having a portion thereof abutting said supporting collar 46 on said pivot rod. When the cover is in attached position, said cover pivot arm 48 extends radially inwardly and terminates in an inner end 52 substantially at the center of said tank provided with a vertical bore 54 substantially concentric with said tank and on which the cover may be vertically adjustably mounted to be raised from said tank and pivoted away from said tank on pivotal movement of the cover pivot arm 48 on its pivot cover rod 42, the specific means for this purpose being described later.

While any suitable type of a cover may be employed, certain features of my invention relate to a cover construction which is relatively easy to fabricate, comprising two castings and when employing my improved cover, I provide an exterior cover ring 56 having an annular groove 58 in the lower surface of the outer edge thereof for compactly receiving the circular upper end 60 of the tank 10 therein, suitable washer or gasket means 61 being supplementally provided in this groove for sealing purposes if desired. To provide means to attach the cover disc 76 to said cover ring 56, I also provide an annular channel 64 extending from the inner edge of the top wall thereof to an annular shoulder 66 spaced from the outer edge of said top wall. Said cover ring 56 may thus provide convenient means for the welding or other attachment thereto of the substantially similarly spaced pairs of cover clamp lugs 68 projecting radially from said cover ring at substantially equally spaced intervals and generally similarly to the spaced pairs of lower cover clamp lugs 30 mounted on said strap 14. If desired, the lugs 30 and 68 may be mounted on the strap 14 and cover ring 56 prior to assembly or may even be cast integral therewith or if desired may be readily attached as by welding in the manner diagrammatically shown after the cover ring 56 and strap 14 are mounted on the tank. With my improved construction, however, this becomes immaterial.

As stated hitherto, the strap 14 is split as at 15 and the split ends thereof are adjustably tightened around the tank in the manner explained. The theoretical amount of the split 15 is figured and the lugs 30 and 68 may be mounted respectively on said strap 14 and cover ring 56 relative to the theoretical amount of the split 15. In the event, however, that a slight mistake be made in figuring the amount of the split, I have provided a double tolerance to permit the locking bolts 36 to remain between the respective pairs of lugs 30 and 68 in attached position. I have provided a tolerance in the lower portion by making the bolt eyes or loops 38 of less diameter than the distance between the lugs 30 and loosely mounting them on the pivot rods 34 and I have similarly made the upper threaded portions 37 of the locking bolts 36 of less diameter than the spacings between the pairs of upper cover clamp lugs 68 mounted as explained on the cover ring 56 to provide a supplemental tolerance for this purpose at the upper end of said bolts 36 to provide for the adjustability of the tank bracket strap 14.

Suitable means are provided to be threadedly adjustable on the upper threaded ends 37 of said locking bolts 36 to abut against the upper surfaces of said lugs 68 to positively clamp the cover to the tank with the upper edge 60 of the tank fitting into the annular groove 58 provided in the cover for this purpose if employed and in my preferred embodiment said locking means comprise locking wheels 70 having central threaded holes 72 in the hubs 74 thereof for threading on the upper ends 37 of said cover clamping bolts 36 to adjustably urge the lower surfaces of the hubs against said cover ring clamp lugs 68.

In my preferred embodiment of cover, I preferably provide a cover disc 76 having the outer edge 78 thereof welded within the annular groove 64 on the upper surface of the cover ring 56.

If desired, however, instead of making the cover in two pieces, namely, the ring 56 and disc 76, the cover 62 may be made in a single casting, but preferably the pairs of clamping lugs 68 are supplementally attached to the outer edge thereof rather than by expensively milling radial slits therein. It is also apparent that while the annular groove 58 is highly desirable, it may be omitted if desired.

As a portion of the improved type of means to lift the cover 62 on the crane arm 48, I preferably provide a threaded cover bolt 80 having the lower end thereof rigidly secured to or integral with the center of the cover 62 projecting upwardly through the vertical bore 54 in the inner end 52 of said cover pivot arm 48. Suitable means are provided to engage the threads of the bolt 80 and lift the cover 62, in my preferred embodiment said means comprising a rotary wheel 82 having a hub 83 having a threaded bore 85 threadedly mounted on the upper threaded end of the bolt 80 for raising on rotation thereof said cover 62 including the cover disc 76 and attached cover ring 56 if employed from said tank top 12 to permit lateral swinging of said cover 62 on said cover pivot arm 48 away from the open end 12 of the tank 10 for charging or cleaning purposes.

While any suitable type of cooperating means on the tank and cover to secure said cover to said ring may be provided, I preferably mount the lower portion of said means on the tank strap 14 and the upper portion of said means on the cover 62. It is also apparent that if desired any suitable type of crane means may be employed for lifting the cover from the tank and pivoting it away therefrom and that such means may be suitably mounted on any portion of the tank, but it is apparent that in the specific construction shown, I have so mounted the cover bracket 24 on said strap 14 as to supplementally provide a positive locking bridge for retaining said strap 14 in compressed position around said tank.

I have shown in Figs. 4–7 a different modification of my invention of simpler and more readily fabricated construction. In this instance each pair of lower cover clamp lugs 30′ and each pair of upper cover clamp lugs 68′ comprise a U-shaped metal stamping 100 but for purposes of more ready attachment to form the lower pair of clamping lugs 30′ each U-shaped metal stamping 100 has the side thereof welded to the strap 14, but to form the upper pair of lugs 68′, each U-shaped metal stamping 100 has the base thereof welded to the downwardly projecting wall 56′ of the pressed metal cover 62′ shown therein.

To provide the annular socket or groove 58′ for receiving the washer or gasket means 61′ therein, the circumference of the downwardly projecting integral side wall 56′ of the cover 62′ is either slightly smaller than the circumference of the tank upper end 60′ as shown in Figs. 4–6, or the circumference of the integral downwardly projecting side wall 56″ of the cover is slightly larger than the circumference of the tank upper end 60″ and I provide a rolled, preferably right angle metal ring 90 having a horizontal upper wall 92 having the free end 94 thereof welded to the inner or outer surface of the downwardly projecting cover side wall 56′ or 56″, in the embodiment shown in Figs. 4–6 to the outer surface thereof and in the embodiment shown in Fig. 7 to the inner surface thereof, said ring 90 having an integral wall 96 projecting downwardly from the other end of said horizontal wall 92 forming an annular socket or groove 58′ as shown in Figs. 4–6 exterior of the downwardly projecting integral cover wall 56′ or the annular socket 58″ interior of said downwardly projecting cover wall 56″ as shown in Fig. 7 with either the exterior socket 58′ as shown in Figs. 4–6 or the interior socket 58″ as shown in Fig. 7 being adapted to receive respectively the annular packing rings 61′ or 61″ adapted to abut the circular upper tank end 60′ as shown in Figs. 4–6 exterior of said cover wall 56′ or the upper tank end 60″ as shown in Fig. 7 interior of the downwardly projecting cover wall 56″ to tightly seal and prevent leakage between the cover and tank top in similar fashion as the gasket or packing 61 contained in the groove 60 of the cover ring 56 in the embodiment shown in Figs. 1–3.

It is thus obvious that I have provided a novel type of tank cover construction formed of a simple number of parts which may be readily fabricated, easily assembled and positively locked in position, the construction of the various parts thereof cooperating to assist in performing more than one function with the advantages explained more in detail above.

It is understood that my invention is not limited to the specific embodiments shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. A cover construction for tanks for filtration and other purposes, comprising a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank, a locking bracket having legs bridging said split having ends welded to opposite end portions of said strap after tightening thereof, a cover ring having an annular groove for compactly receiving the circular upper edge of the tank therein and an annular channel extending from the inner edge of the top wall thereof to an annular shoulder spaced from the outer edge of said top wall and a disc cover having the outer edge thereof welded within the annular groove on the upper surface of the cover ring, cooperating means on said tank strap and cover ring to secure said cover to said tank, and crane means pivotally mounted on said bracket for raising said cover from said tank and pivoting it from over said tank.

2. A cover construction for tanks for filtration and other purposes, comprising a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank, a locking bracket having legs bridging said split having ends welded to opposite end portions of said strap after tightening thereof, a cover having a side wall of substantially the circumference of the tank top having an annular packing ring to abut and seal the upper end of the tank, cooperating means on said tank strap and cover to secure said cover to said tank and crane means pivotally mounted on said bracket for raising said cover from said tank and pivoting it from over said tank.

3. A cover construction for tanks for filtration and other purposes, comprising a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank, a locking bracket having legs bridging said split having ends welded to opposite

end portions of said strap after tightening thereof, a cover having a side wall of substantially the circumference of the tank top having an annular packing ring to abut and seal the upper end of the tank and cooperating means on said tank strap and cover to secure said cover to said tank.

4. A cover construction for tanks for filtration and other purposes, comprising a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank, a locking bracket having legs bridging said split having ends welded to opposite end portions of said strap after tightening thereof, a cover having a side wall of substantially the circumference of the tank top having an annular packing ring to abut and seal the upper end of the tank and crane means pivotally mounted on said bracket for raising said cover from said tank and pivoting it from over said tank.

5. A cover construction for tanks for filtration and other purposes comprising, a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank and substantially equally spaced pairs of lower cover clamp lugs projecting radially therefrom at substantially equally spaced distances thereon, threaded cover bolts of less diameter than the spacings between the lugs of each pair pivotally mounted on said lugs, a locking bracket having legs bridging said strap split having ends welded to opposite end portions of said strap after tightening thereof, a cover having a side wall of substantially the circumference of the tank top having an annular packing ring to abut and seal the upper end of the tank and substantially similarly spaced pairs of upper cover clamp lugs projecting radially therefrom at substantially equally spaced distances with the distances between each lug of each pair substantially greater than the diameter of said cover pivot bolts to provide a tolerance for the adjustability of the tank bracket strap and locking means for threading on the upper ends of said cover clamping bolts to adjustably clamp the lower surfaces thereof against said upper cover clamp lugs.

6. A cover construction for tanks for filtration and other purposes comprising, a split tank strap surrounding the upper end of the tank having means thereon to initially tighten said strap around said tank and substantially equally spaced pairs of lower cover clamp lugs projecting radially therefrom at substantially equally spaced distances thereon, each pair of lugs comprising a U-shaped metal stamping having the side thereof welded to the strap outer wall, threaded cover bolts of less diameter than the spacings between the lugs of each pair pivotally mounted on said lugs, a locking bracket having legs bridging said strap split having ends welded to opposite end portions of said strap after tightening thereof, a cover having a side wall of substantially the circumference of the tank top having an annular packing ring to abut and seal the upper end of the tank and substantially similarly spaced pairs of upper cover clamp lugs projecting radially therefrom at substantially equally spaced distances with the distances between each lug of each pair substantially greater than the diameter of said cover pivot bolts to provide a tolerance for the adjustability of the tank bracket strap, each pair of lugs comprising a U-shaped metal stamping having the U-base thereof welded to the tank and locking means for threading on the upper ends of said cover clamping bolts to adjustably clamp the lower hub surfaces thereof against said upper cover clamp lugs.

HERBERT G. BEEDE.