

Nov. 25, 1924.

G. T. HORTON

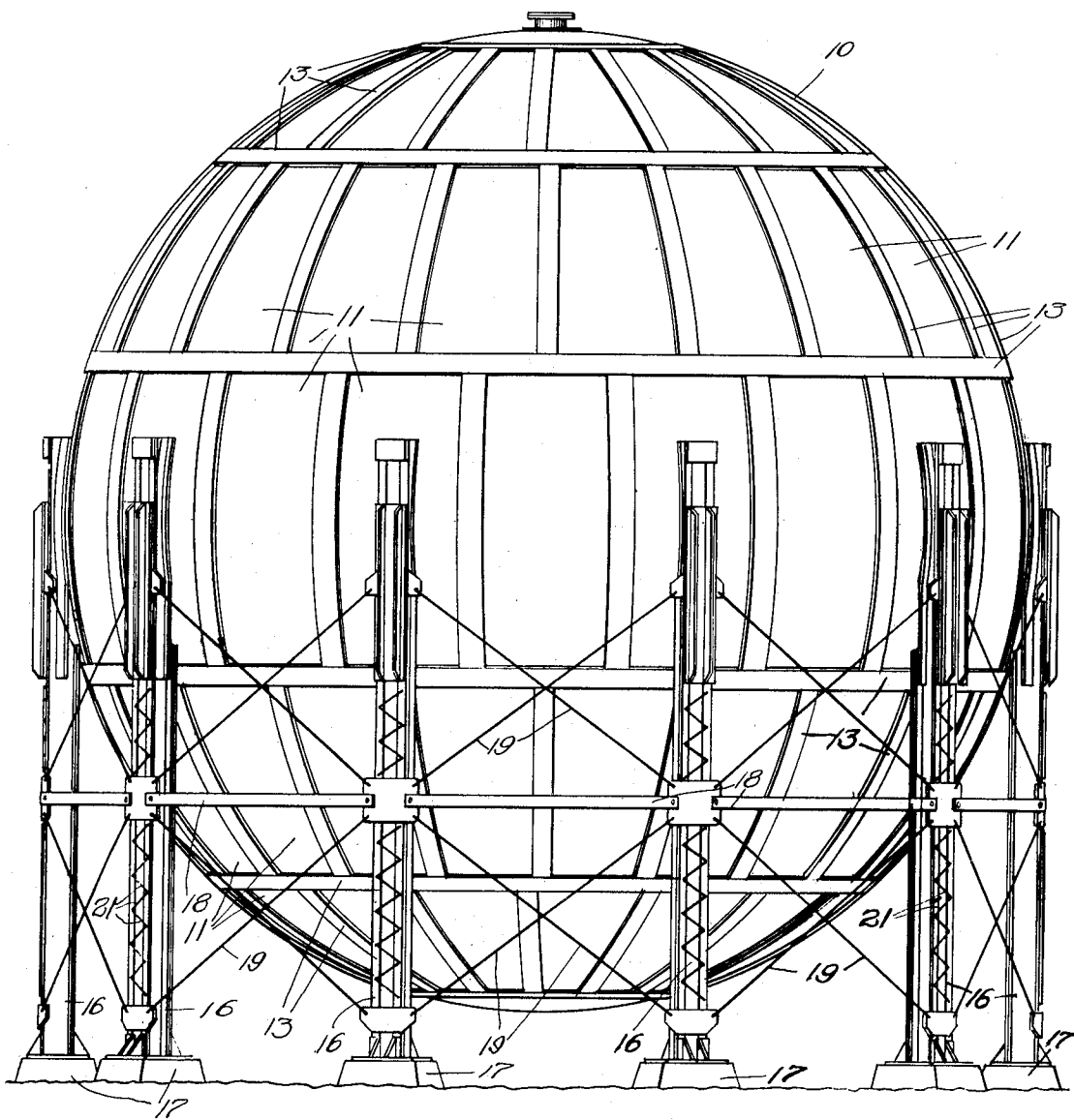
1,517,006

TANK

Filed Dec. 15, 1923

3 Sheets-Sheet 1

Fig. 1.



Inventor:
George T. Horton,
By *Cyrenforth, Lee, Clinton, & Miles,*
Attys.

Nov. 25, 1924.

G. T. HORTON

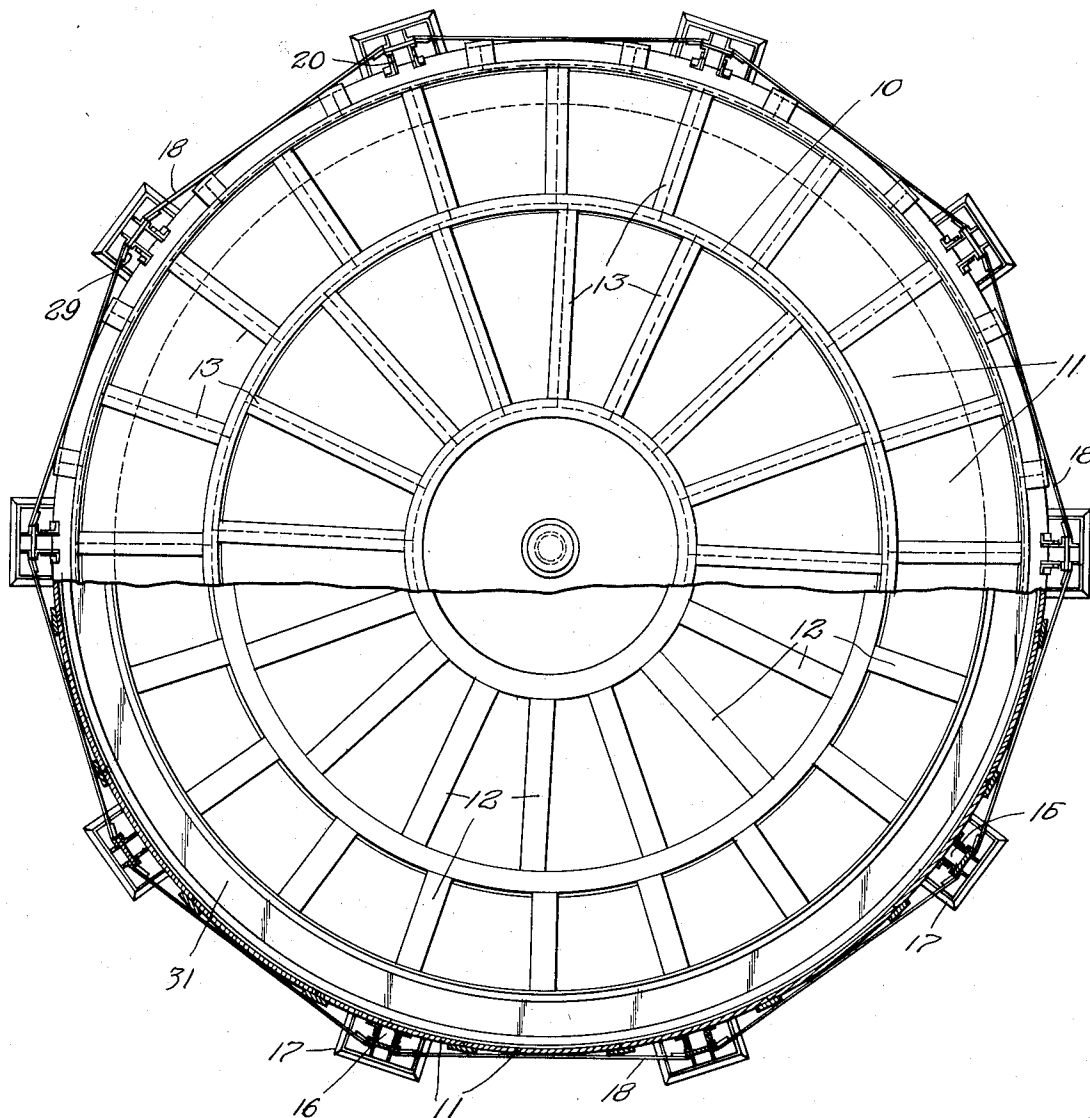
1,517,006

TANK

Filed Dec. 15, 1923

3 Sheets-Sheet 2

Fig. 2.



Inventor:

George T. Horton,

By Ogdenforth, Lee, Clinton, & Mules,

Attorneys.

Nov. 25, 1924.

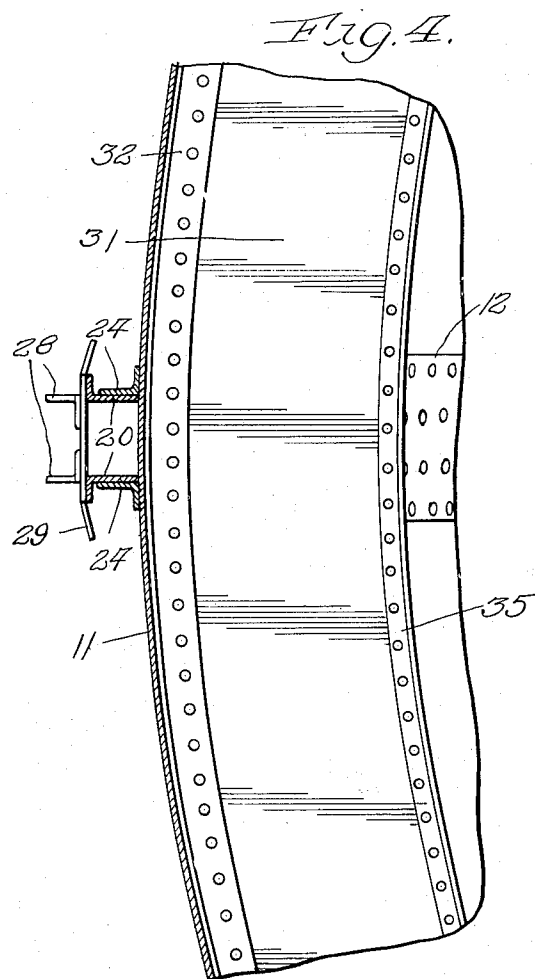
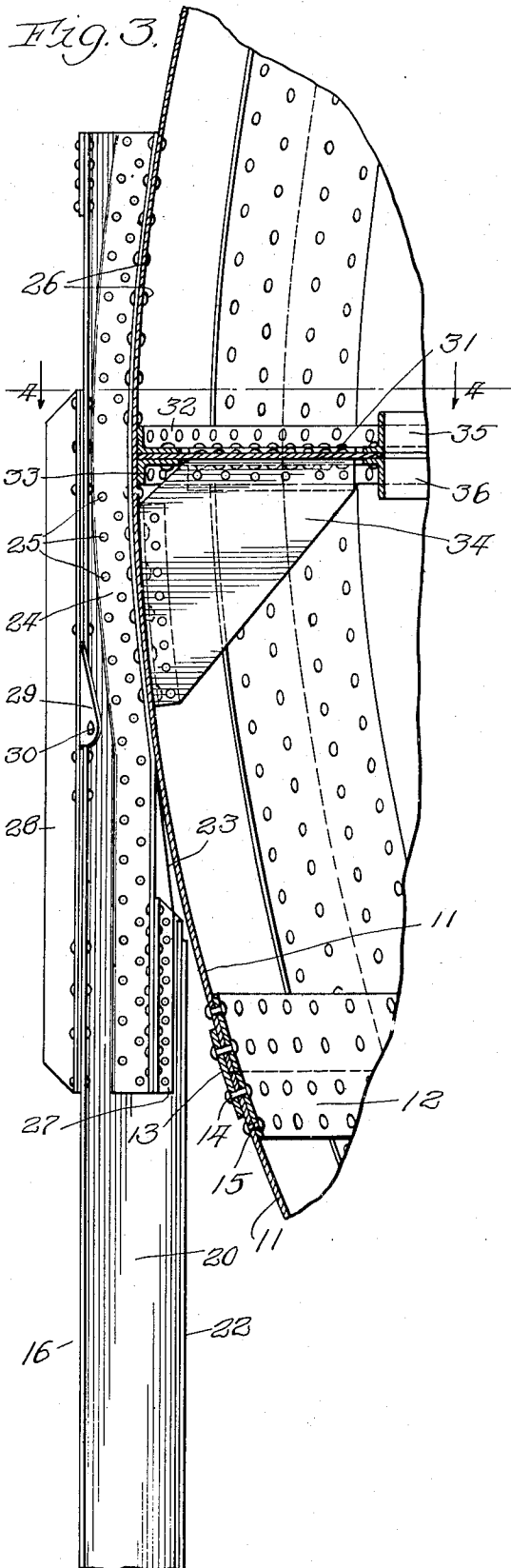
G. T. HORTON

1,517,006

TANK

Filed Dec. 15, 1923

3 Sheets-Sheet 3



Inventor:
George T. Horton,
By Dyerforth, Lee, Chilton & Wiles,
Att'ys.

UNITED STATES PATENT OFFICE.

GEORGE T. HORTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO BRIDGE & IRON CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TANK.

Application filed December 15, 1923. Serial No. 680,909.

To all whom it may concern:

Be it known that I, GEORGE T. HORTON, a citizen of the United States, residing at 105th and Throop Sts., Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tanks, of which the following is a specification.

This invention relates to improvements in tanks and more especially to a storage tank designed primarily for the storage of volatile liquids such as gasoline and the like. Ordinarily, in the storage of such liquids, there is considerable loss from evaporation, unless the tank is entirely closed. If this is done, it is obvious that there will be considerable pressure developed inside of the tank due to evaporation of the liquid, expansion of the gases, and the like.

My improved tank is designed to withstand a considerable amount of pressure and still have a relatively large capacity. For example, the tank shown in this application is designed for capacity of substantially 433,000 gallons and has a diameter of substantially 48 feet. My improved storage tank is made spherical in form so that with the minimum amount of weight, a maximum amount of pressure may be held. In making a tank of this size spherical in shape, many difficulties were encountered in properly supporting it, making it of the proper strength, and the like. These difficulties have all been overcome in my improved tank which is shown and described more in detail hereinafter.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In that form of device embodying the features of my invention shown in the accompanying drawings, Figure 1 is a view in front elevation of a tank, Figure 2 is a top view partly in plan and partly in section, Figure 3 is a vertical sectional view on an enlarged scale taken through the top of one of the posts showing the method of joining the post to the tank and also showing the balcony inside, and Figure 4 is a view taken as indicated by the line 4 of Fig. 3.

As shown in the drawings, the tank comprises a spherical shell 10 made up of plates 11 properly curved and shaped to form a

sphere when fastened together. The plates 11 are here shown as joined at their edges by butt-straps 12 and 13 on the inside and outside respectively. The butt-straps 12 on the inside are slightly wider than the straps 13 on the outside. The straps are suitably joined by an inner row of rivets 14 and an outer row of rivets 15 fastens the outer edges of the inner strap 12 to the shell plate 11.

The shell is entirely supported by ten vertical posts 16 set on the piers 17. The posts are suitably joined by means of the struts 18 and rods or braces 19, as shown.

It is to be particularly noted that the spherical shell is attached to the posts at their upper ends around the middle of the shell and that the shell has no other support. As shown in Fig. 1, the bottom of the shell does not rest on the ground and is not supported except as it hangs from the posts. By supporting the tank in this manner, there is the least possible tendency to distort the shape of the tank. The method of attaching the posts to the shell is shown more clearly in Figs. 3 and 4. It is to be noted that the post is formed of two channel irons 20 joined by lacing 21 on the outside and a flat plate 22 on the inside. At the upper end the channels 20 are cut away on a curvature 23, conforming to the curvature of the shell 11. Attached to each of the channels 20 is an angle iron 24 bent to a similar curvature. Each of the angle irons 24 is riveted to one of the channels 20 by means of the rivets 25 as shown, and the other flange of the angle irons 24 is attached to the shell of the tank by means of the rivets 26. At the lower ends of the angle irons 24 there are attached shorter angle irons 27 which are riveted to the channels 20 for reinforcing purposes. At the upper end of each post on the outside there are likewise fastened two angle irons 28 as shown and between these angle irons and the post is clamped a plate 29 having holes 30 to which the rods 19 are attached. It is to be noted that the channels 20 are cut away at 23 so that the line of attachment between the shell and the post falls substantially over the center of the post. By means of this construction, bending or warping of the post is prevented.

To the inside of the tank is attached a

circular balcony 31 as shown. The attachment is made with the shell by means of angle irons 32 and 33 above and below the balcony respectively; and brackets 34 are placed at suitable intervals to give additional support. The inner edge of the balcony 31 is stiffened by means of the angle irons 35 and 36.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as possible in view of the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. A storage tank comprising a spherical shell substantially supported by vertical posts attached at their upper ends to the shell, the points of attachment lying in or close to a horizontal plane passing through the center of the shell, and each of the posts being cut away so that the points of attachment between a post and the shell lie substantially over the center of the post.

2. A storage tank comprising a spherical shell substantially supported by vertical posts attached at their upper ends to the shell, each of the posts being cut away at the point of attachment so that a vertical plane tangential to the shell will pass substantially through the center of the post.

3. A storage tank comprising a spherical shell substantially supported by vertical posts attached at their upper ends to the shell, the points of attachment lying in or close to a horizontal plane passing through the center of the shell, and each of the posts being cut away so that a vertical plane tangential to the shell will pass substantially through the center of the post.

4. A storage tank comprising a spherical shell substantially supported by vertical posts formed of channel members, each of the posts having substantially one half of its width cut away at the upper end on a curvature conforming to the curvature of the spherical shell, said upper ends of the posts being attached to the shell.

5. A storage tank comprising a spherical shell substantially supported by vertical posts, each of the posts having substantially one half of its width cut away at its upper end on a curvature conforming to the curvature of the spherical shell, and curved angle irons attached to the upper end of each post conforming to the curvature of the cut away portions, said angle irons being attached to the posts and to the spherical shell.

6. A storage tank comprising a spherical shell substantially supported by a plurality of vertical posts arranged about its periphery, each of said posts comprising a pair of channel irons suitably fastened together and having substantially one half of their widths cut away at their upper ends on a curvature conforming to the curvature of the spherical shell, and angle irons riveted to the upper ends of the channels curved to conform to the curvature of the cut away portion, said angle irons also being riveted to the spherical shell.

7. A storage tank comprising a spherical shell substantially supported by vertical posts attached at their upper ends to the shell, each of the posts being cut away at the point of attachment so that a vertical plane tangential to the shell will pass substantially through the center of the post, and a horizontal balcony on the interior of the shell lying substantially in a horizontal plane passing through the center of the shell.

In witness whereof, I have hereunto set my hand and seal this 5th day of December, 1923.

GEORGE T. HORTON. [L. S.]