

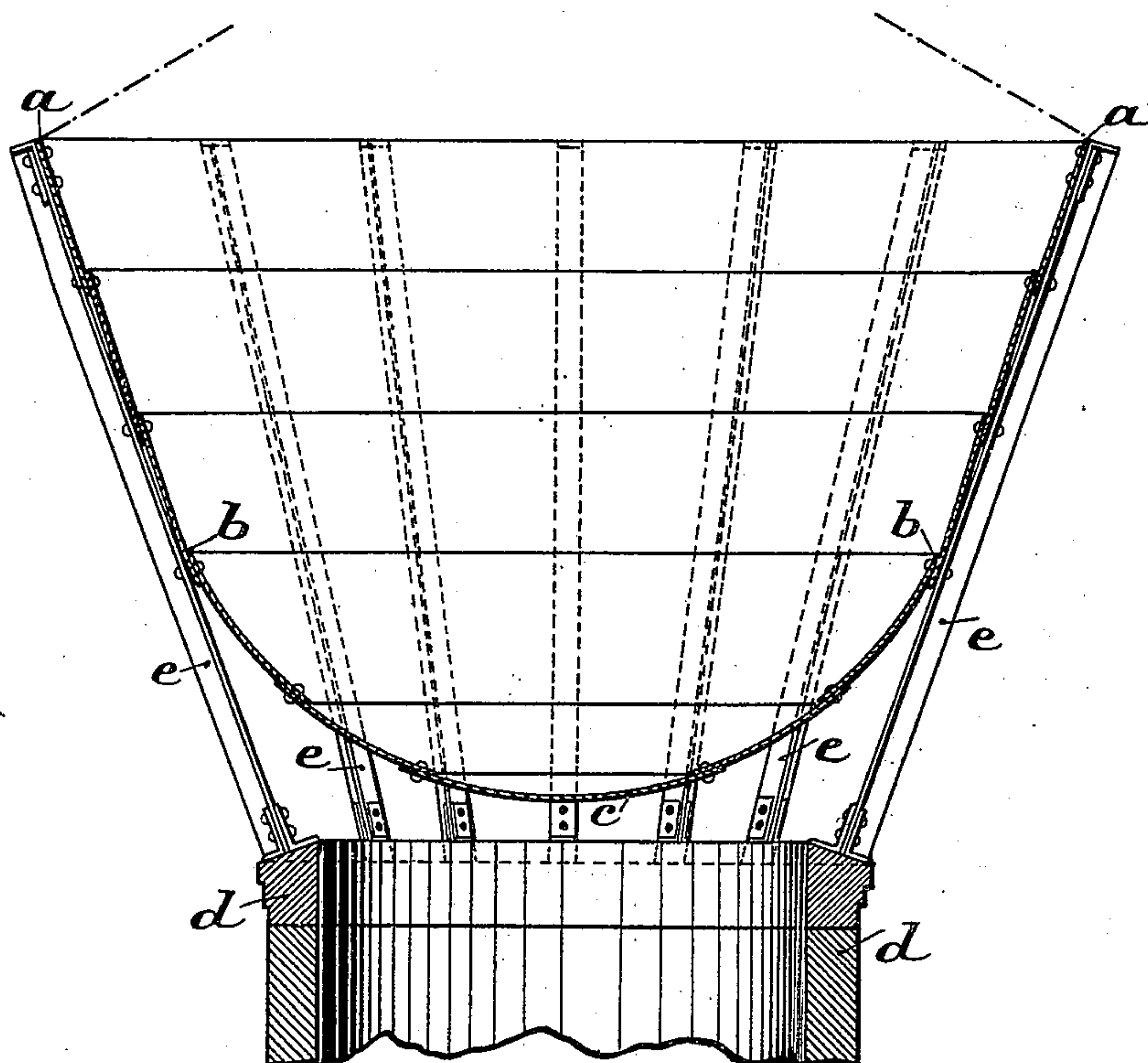
No. 690,390.

Patented Jan. 7, 1902.

K. G. BARKHAUSEN.  
DISTRIBUTING TANK.

(Application filed Jan. 6, 1900.)

(No Model.)



WITNESSES

*C. E. Stuever*  
*C. J. Schmidt*

INVENTOR

KARL GEORG BARKHAUSEN.

BY

*Charles A. Brown & Co.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

KARL GEORG BARKHAUSEN, OF HANOVER, GERMANY.

## DISTRIBUTING-TANK.

SPECIFICATION forming part of Letters Patent No. 690,390, dated January 7, 1902.

Application filed January 6, 1900. Serial No. 584. (No model.)

*To all whom it may concern:*

Be it known that I, KARL GEORG BARKHAUSEN, professor, a subject of the German Emperor, residing at Hanover, Germany, have  
5 invented a certain new and useful Improvement in Distributing-Tanks, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of  
10 this specification.

The forms hitherto selected for distributing containers or tanks, more particularly for the tanks of water-towers, always show places where the tank-skin suddenly alters its contour or direction. At such places forces arise  
15 which do not coincide with the direction of the tank-skin itself, and therefore at such places special strengthening or stiffening rings must always be employed which are designed to absorb or counteract these forces. The construction of such strengthening or stiffening rings in the forms of such vessels hitherto selected requires without exception  
20 bars of cross-sectional forms, the making of which is always very difficult and the bending of which in a circle necessitates a disproportionately costly operation. The meeting or abutting of a large number of parts at such an edge, moreover, from the first gives  
25 cause for leakages or untightness, because such places are only with difficulty riveted tight and made water-tight, and, further, the repairs which become necessary when leakages once occur are made more difficult. Finally, the mounting or support of such  
30 tanks requires either an annular support-surface or when separate points of support distributed in a circle are only provided necessitates the employment of annular girders, which have to be made specially strong, because the free supporting parts of the same  
35 are not merely subjected to strains which act in a plane carried vertically through the points of support. These drawbacks are  
40 avoided by the form of tank hereinafter described, which forms the object of the present invention.

My invention consists in giving the section of the tank such a shape that all stresses  
50 caused by the weight of the liquid, the weight of the structure, &c., coincide with the skin

of the tank itself and that said skin forms its own support.

In the accompanying drawing a vertical section of a tank constructed according to  
55 the present invention is shown.

The tank consists of the conical portion *a a b b*, to which is attached a bottom *b c b*, which in the example shown has the shape of a spherical shell, the upper edge of which  
60 tangentially coincides with the lower edge of the aforesaid conical portion. The tank is supported by a series of straight supports *ee*, which are riveted to the skin itself and form rectilinear prolongations of the conical part  
65 of every vertical section carried through a pair of these supports. The supports *ee* rest on an annular base constructed of masonry. The peculiar properties of this construction will be clearly understood if I point out that  
70 by giving the skin a shape the vertical section of which contains no corners all stresses the direction of which coincides with radial vertical planes will also coincide with the skin itself, and will therefore be taken up by  
75 said skin without the help of special strengthening structures, such as strengthening-rings and the like. Moreover, the rectilinear or conical part of the structure will itself act as a ring-shaped girder, thus permitting the em-  
80 ployment of a series of single supports instead of a ring-shaped continuous support. Lastly, by giving this rectilinear part of the section a certain amount of taper the diameter of the supporting substructure is dimin-  
85 ished, thus effecting a considerable saving in masonry.

I would have it understood that I do not consider it essential that the bottom of the tank should be of a purely spherical shape.  
90 It should only be designed in such a manner that in itself its vertical section forms a continuous curve without any breaks or corners, thus avoiding the construction of edges in the tank, and that the tangential prolongation of  
95 its upper edge shall coincide with the conical or rectilinear portion, thus avoiding the construction of an edge at the point of attachment between the conical and the curved portions.

Having now particularly described and as-  
100 certain the nature of my said invention and



in what manner the same is to be performed,  
I declare that what I claim is—

1. The combination of a stationary tank  
for the storage of liquids, comprising an up-  
5 per conical portion and a curved bottom hav-  
ing its upper edges tangentially coinciding  
with the lower edges of the conical portion,  
rectilinear standards arranged along the sides  
of the conical portion and extending below  
10 the lower edge of the same, and a base to  
which the lower ends of the rectilinear stand-  
ards are secured, substantially as described.

2. The combination of a stationary tank  
for the storage of liquids, comprising an up-  
15 per conical portion and a spherical bottom

having its upper edges tangentially coincid-  
ing with the lower edges of the conical por-  
tion, rectilinear standards arranged along the  
sides of the conical portion and extending  
below the lower edge of the same, and a base 20  
to which the lower ends of the rectilinear  
standards are secured, substantially as de-  
scribed.

In witness whereof I have hereunto sub-  
scribed my name this 1st day of December, 25  
A. D. 1899.

KARL GEORG BARKHAUSEN.

Witnesses:

LEONORE KASCH,  
KIRKE LATHROP.