

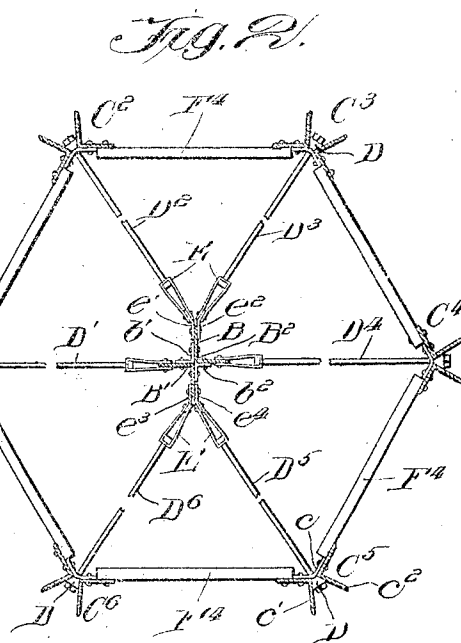
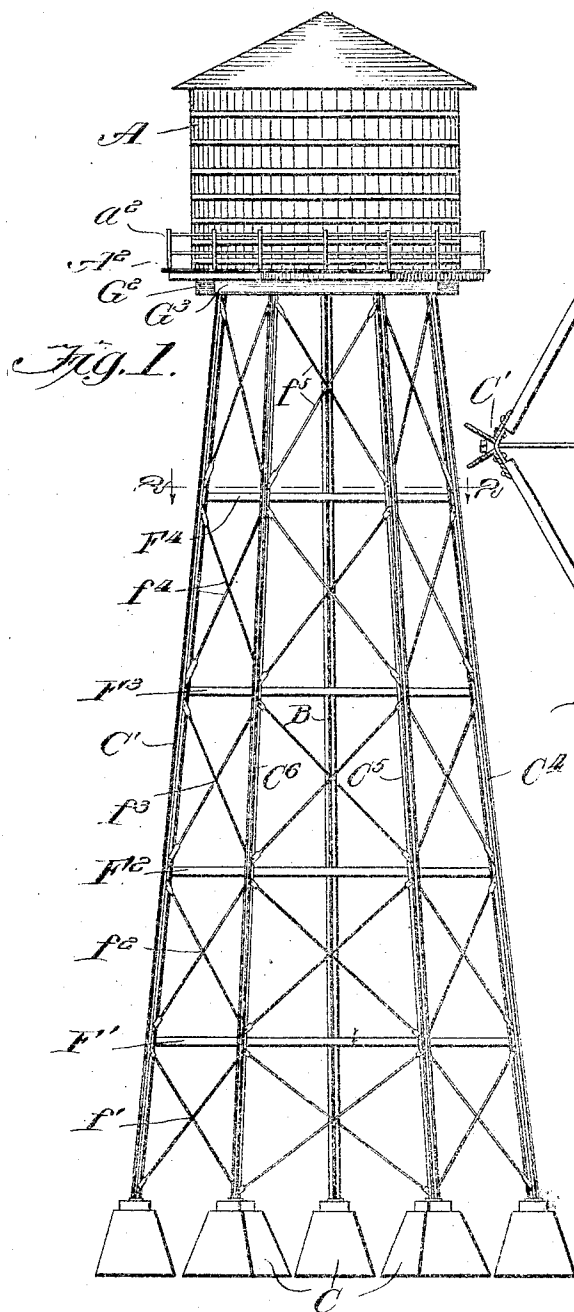
No. 839,942.

PATENTED JAN. 1, 1907.

A. K. MANSFIELD.
SUPPORTING STRUCTURE FOR TANKS.

APPLICATION FILED JULY 25, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

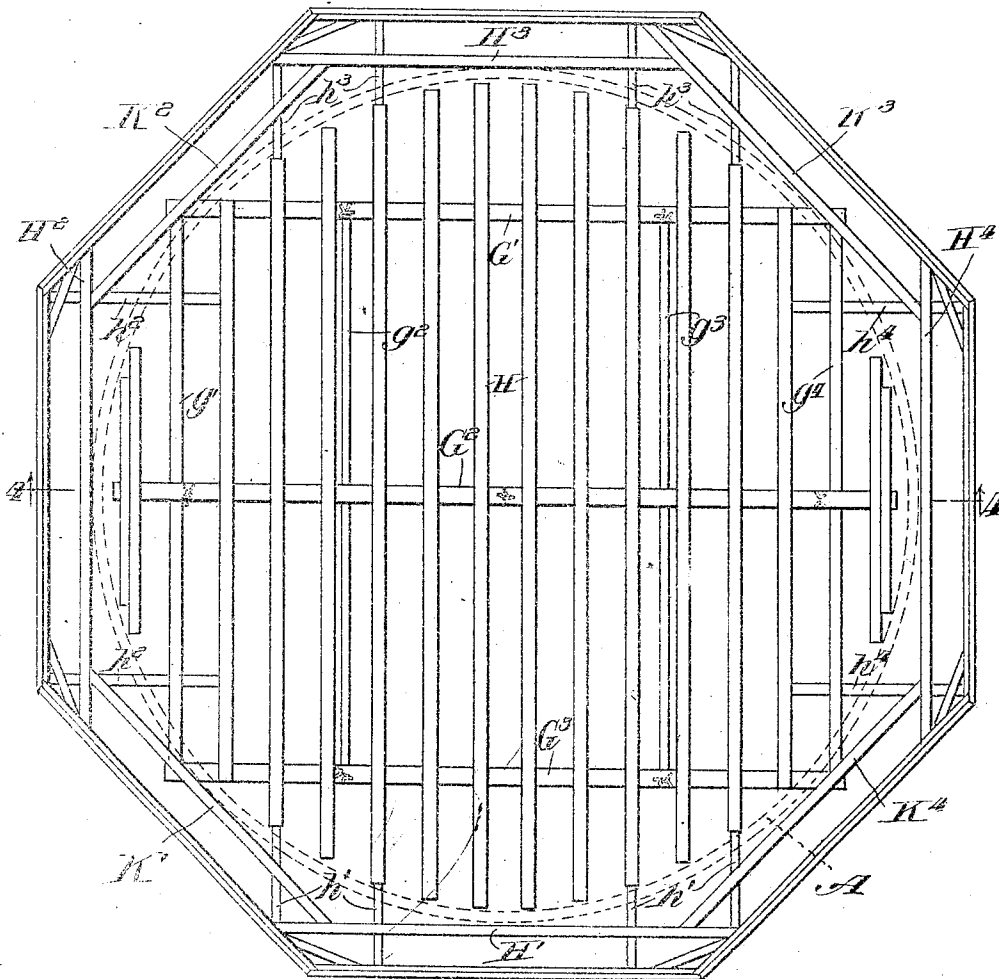
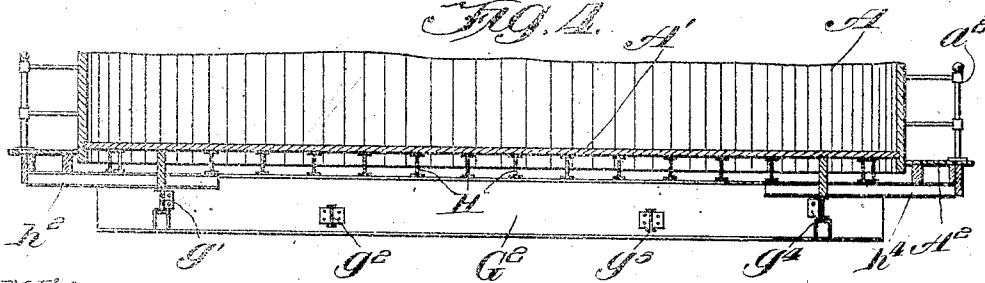


Fig. 4.



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UNITED STATES PATENT OFFICE.

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SUPPORTING STRUCTURE FOR TANKS.

No. 839,942.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT K. MANSFIELD, a citizen of the United States, residing at Batavia, county of Kane, State of Illinois, have invented a certain new and useful Improvement in Supporting Structures for Tanks; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to elevated tanks, and more particularly to a supporting structure for such tanks.

The weight of an elevated tank, especially one of large capacity, is so great that it is necessary to provide a supporting structure of great strength and at the same time one which will offer the least surface to the action of the wind. It is also necessary that the structure should support the bottom of the tank at a number of points in order that the weight of the water may not cause leakage.

The primary object of my invention is to provide a supporting structure for elevated tanks which will comprise a plurality of upright columns so arranged as to form a strong supporting structure and one which will afford an extended support for the bottom of the tank.

A further object of my invention is to provide a supporting structure for elevated tanks which will be simple in construction, economical to build, and durable in use.

The embodiment of my invention herein disclosed may be generally described as comprising a central upright column composed of two angle-irons rigidly secured together, with their flanges extending in opposite directions, a plurality of upright columns located around and spaced equal distances from the central column, each of said plurality of columns composed of two angle-irons rigidly secured together, with their flanges projecting on opposite sides of a radial line from the central column, tie-rods rigidly uniting each of the surrounding columns to the central column, braces and girths uniting the alined flanges of adjacent columns, a central horizontal beam supported upon the central column and the surrounding columns alining

therewith, parallel horizontal beams supported on the opposite sides of the central beam upon the upper ends of a pair of alining columns, and a plurality of beams supported transversely upon the horizontal beams upon which the bottom of the tank rests.

My invention will be more fully described hereinafter, with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is an elevational view; Fig. 2, an enlarged sectional view on line 2 2, Fig. 1; Fig. 3, an enlarged plan view of the top of the supporting structure upon which the bottom of the tank rests; and Fig. 4, a sectional view on line 4 4, Fig. 3.

The same reference characters are used to designate the same parts in the several figures of the drawings.

Reference-letter A designates a tank of any suitable construction supported in an elevated position by my improved structure.

Reference-letter B indicates a central upright column, preferably composed of two angle-irons B' and B², united with their apices together by means of angle-brackets b' and b².

Reference characters C', C², C³, C⁴, C⁵, and C⁶ designate upright columns surrounding and preferably arranged at equal distances from the central column B. Each of the surrounding columns is preferably constructed of two angle-irons c' and c², rigidly united with their apices adjacent each other by means of angle-brackets c. The angle-irons forming each of the surrounding columns are so united by the brackets c that the flanges on the adjacent columns will aline, as clearly shown in Fig. 2. When six surrounding columns are employed, the inner flanges of the angle-irons of each column form an angle of one hundred and twenty degrees in order that the flanges on adjacent columns may aline.

The alined flanges of the surrounding columns are rigidly united by a series of horizontal braces, (indicated in Fig. 1 by reference characters F' F² F³ F⁴.) The angle-braces c are preferably located in each of the horizontal planes of the several series of braces. The panels of the supporting structure composed of the upright columns formed by the

several series of horizontal braces are preferably of gradually-increasing height upwardly in order that the strength of the structure may be gradually increased toward its base, thereby rendering it universal to use columns of uniform cross-section and at the same time having the increased strength near the base of the structure necessary to support the increased load imposed upon it. In order to increase the rigidity of the structure, a series of crossed diagonals unite the alined flanges of the columns intermediate of the several series of horizontal braces.

f' designates the crossed diagonals intermediate of the foundations C of the columns and the lowest series F' of horizontal braces.

The succeeding series of crossed tie-rods are designated by reference characters f^2, f^3, f^4 , and f^5 .

Each of the respective surrounding columns is united to the central column B by radial tie-rods, (designated by characters D', D^2, D^3, D^4, D^5 , and D^6 .) Each of such tie-rods is secured to a block D, interposed between the outside flanges of the two angle-irons united to form each column. The tie-rod passes between the apices of the united angle-irons and is secured at its opposite end to a yoke E, such yoke being secured to one of the flanges of the united angle-irons forming the central column. The yokes uniting the inner ends of the tie-rods D' and D^4 to the central column are secured directly to the alining flanges of the angle-irons B' and B^2 . The yokes uniting the tie-rods D^2 and D^3 are connected to brackets e' and e^2 , rigidly secured to the same flange of the angle-iron B^2 , while the yokes uniting the tie-rods D^5 and D^6 are connected to brackets e^3 and e^4 , secured to the same flange of the angle-iron B' . Horizontal I-beams G', G^2 , and G^3 are supported upon the upper ends of the columns, the central beam G^2 lying directly above the central column and the alining surrounding columns C' and C^4 . The beam G' rests near its ends upon the column C^2 and C^3 , while the beam G^3 is supported upon the columns C^5 and C^6 . The horizontal I-beams may be of the same cross-section, owing to the fact that the central one, which is the longest, is supported upon three columns, while the shorter beams G' and G^2 are each supported upon two columns, making the moments acting at the beams approximately the same. The beams G', G^2 , and G^3 are united by transverse beams g', g^2, g^3 , and g^4 in order that they may be rigidly held in upright position to form a base for the tank.

H designates a plurality of parallel I-beams supported transversely upon the beams G', G^2 , and G^3 . The beams H are of graduated lengths, so that they will lie within the lower edge of the side wall of the tank and directly support the bottom wall A' thereof.

The beams H are arranged so close together

that they will afford an extended support for the bottom of the tank, and thereby render unnecessary the use of the usual wooden beams intermediate of the supporting structure and bottom of the tank.

A indicates a platform surrounding the bottom of the tank and which may conveniently be provided with a hand-rail a^2 . The platform rests upon beams H', H^2, H^3 , and H^4 . The beam H' rests upon short beams h', h^2 , aligned with and supported by certain of the beams H. Similar beams h^3 support the beam H^3 . The beams H^2 and H^4 are supported by short beams h^2 and h^4 , respectively, projecting beneath and supported by the adjacent I-beams H. K', K^2, K^3 , and K^4 designate additional beams for supporting the platform A, which are located intermediate of the beams H', H^2, H^3 , and H^4 and rest upon the supporting-beams h', h^2, h^3 , and h^4 .

While I have shown my improved supporting structure as comprising six columns arranged around a central column, yet it will be obvious that a greater or less number of surrounding columns may be employed, according to the size of the tank which is to be supported. It is also evident that any number of radial tie-rods may be employed necessary to securely unite the surrounding columns to the central column. Preferably, however, the radial tie-rods are located in the same horizontal planes as the horizontal braces F', F^2, F^3 , and F^4 .

From the foregoing description it will be observed that I have invented an improved supporting structure for elevated tanks which though simple and economical in construction affords a strong and durable support for a tank of large capacity, and also offers little surface to action of the wind.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a supporting structure for tanks, the combination with a central column, of a plurality of columns surrounding said central column, means connecting said central column with each of the surrounding columns, means for uniting the adjacent surrounding columns, and means for supporting a tank upon the upper ends of said columns.

2. In a supporting structure for tanks, the combination with a central column, of a plurality of columns surrounding said central column, means connecting said central column with each of the surrounding columns, means for uniting the adjacent surrounding columns, a horizontal beam supported upon said central column, and the two alining surrounding columns, parallel horizontal beams at each side of said central beam, and each supported upon two of said surrounding columns, and means for supporting a tank upon said beams.

3. In a supporting structure for tanks, the

combination with a central column, of a plurality of columns surrounding said central column, means connecting said central column with each of the surrounding columns, means for uniting the adjacent surrounding columns, a horizontal beam supported upon said central column, and the two alining surrounding columns, parallel horizontal beams at each side of said central beams and each supported at its ends upon two of said surrounding columns, parallel I-beams supported transversely upon said horizontal beams and arranged sufficiently close together to form an extended support for the bottom of a tank.

4. In a supporting structure for tanks, the combination with a central column, of six columns surrounding and spaced equal distances from said central column, means connecting said central column to each of said surrounding columns, means connecting adjacent surrounding columns, and means for supporting a tank upon the upper ends of said column.

5. In a supporting structure for tanks, the combination with a central column, of six columns surrounding and spaced equal distances from said central column, means connecting said central column to each of said surrounding columns, a horizontal beam supported upon said central column and the two alining surrounding columns, parallel horizontal beams of the same cross-section but shorter than said central beam located on each side of said central beam and each supported upon two of said surrounding columns, and means for supporting a tank upon said beams.

6. In a supporting structure for tanks, the combination with a central column composed of two angle-irons rigidly united with their flanges extending in opposite directions, of a plurality of columns surrounding said central column, tie-rods connecting each of said surrounding columns with one of the flanges of the angle-irons composing said central column, means for uniting the adjacent surrounding columns, and means for

supporting a tank upon the upper ends of said columns.

7. In a supporting structure for tanks, the combination with a central column of a plurality of columns surrounding said central column each composed of two angle-irons united at such an angle that the flanges on adjacent columns aline, means connecting said central column with each of the said surrounding columns, means rigidly uniting the alined flanges of adjacent surrounding columns, and means for supporting a tank upon the upper ends of said columns.

8. In a supporting structure for tanks the combination with a central column, of a plurality of columns surrounding said central column each composed of two angle-irons united at such an angle that the flanges on adjacent columns aline, a radial tie-rod extending between the angle-irons of each of the surrounding columns to said central column, a block interposed between the outer flanges of each of said surrounding columns engaged by the radial tie-rod, means for uniting the alined flanges of the adjacent surrounding columns, and means for supporting a tank upon the ends of said columns.

9. In a supporting structure for tanks, the combination with a central column composed of two angle-irons rigidly united with their flanges extending in opposite directions of a plurality of columns surrounding said central columns each composed of two angle-irons rigidly united at such an angle that the flanges on adjacent columns aline, radial tie-rods connected at their inner ends to the flanges of the angle-irons forming said central column and secured at their outer ends between the angle-irons forming the several surrounding columns, means for uniting the alining flanges on adjacent columns, and means for supporting the tank upon the upper ends of said columns.

In testimony whereof I sign this specification in the presence of two witnesses.

ALBERT K. MANSFIELD.

Witnesses:

GEO. L. WILKINSON,
HARRY S. GAITHER.