

(No Model.)

2 Sheets—Sheet 1.

C. CUNNINGHAM, Jr.
CIRCULAR ROOFED STRUCTURE.

No. 481,347.

Patented Aug. 23, 1892.

Fig. 1.

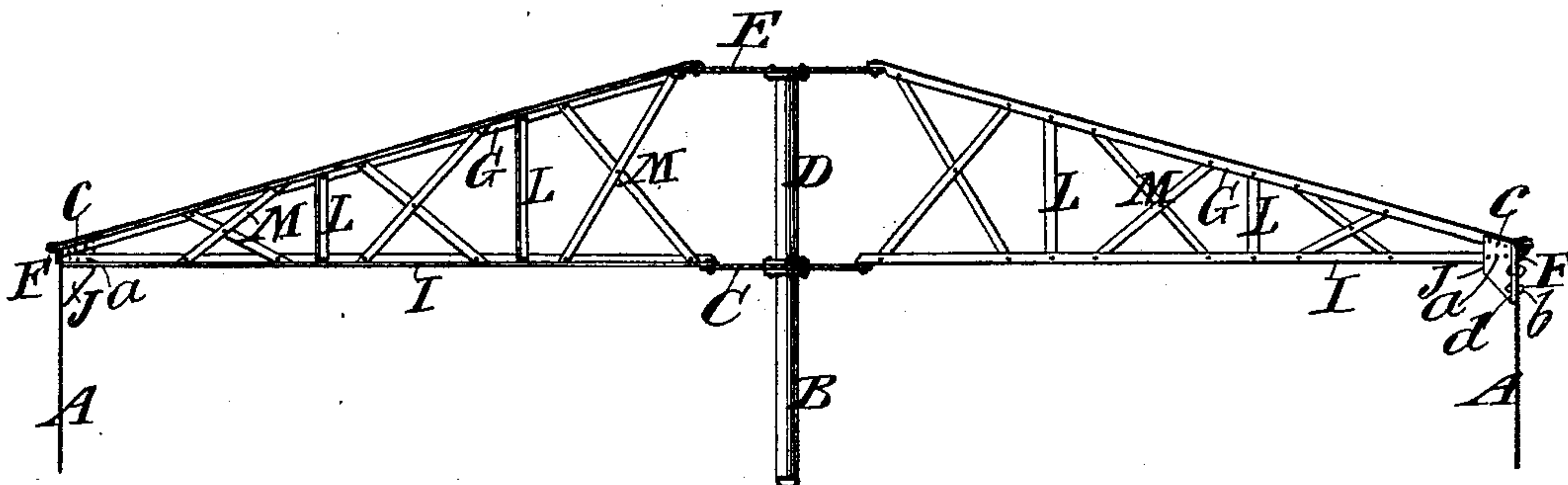
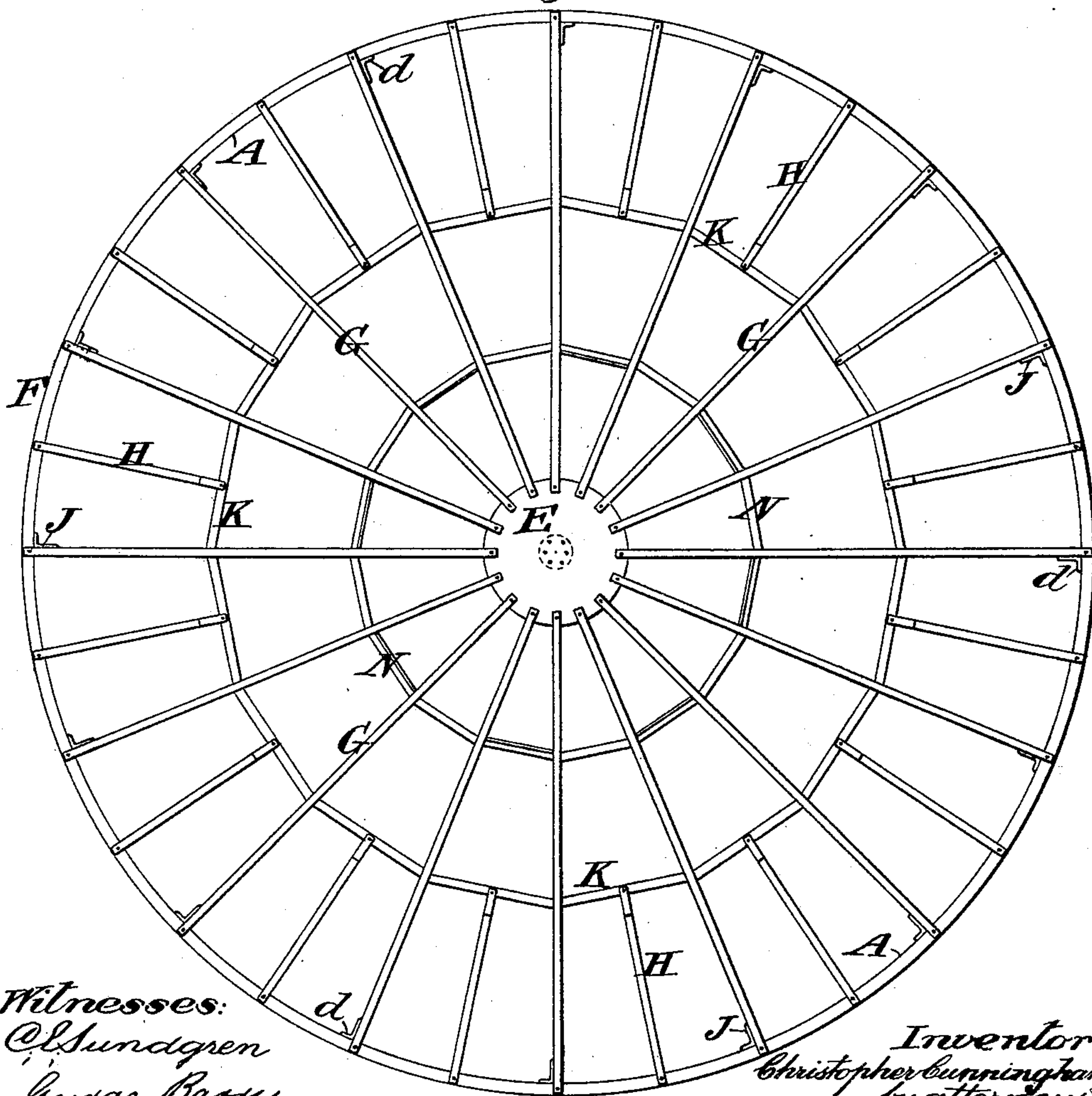


Fig. 2.



Witnesses:
O. Sundgren
George Barry.

Inventor:
Christopher Cunningham,
by attorneys
Brown & Seward

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Fig. 3.

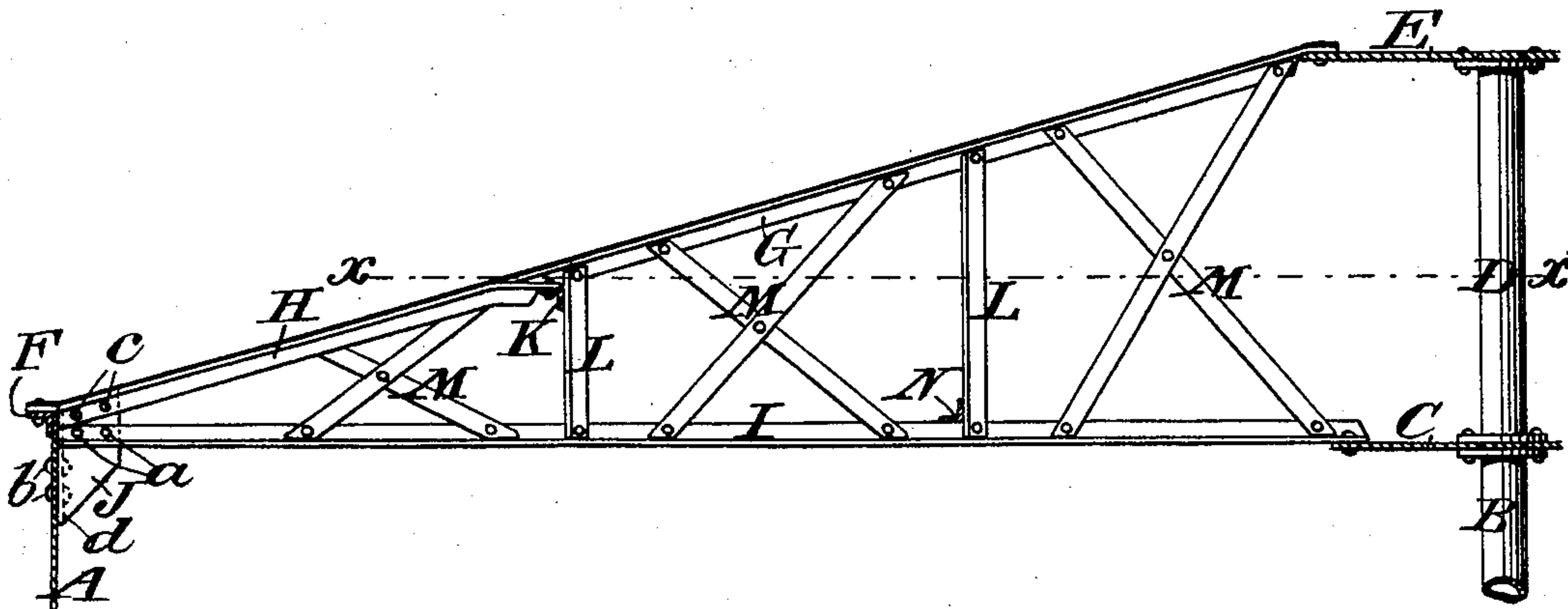


Fig. 4.

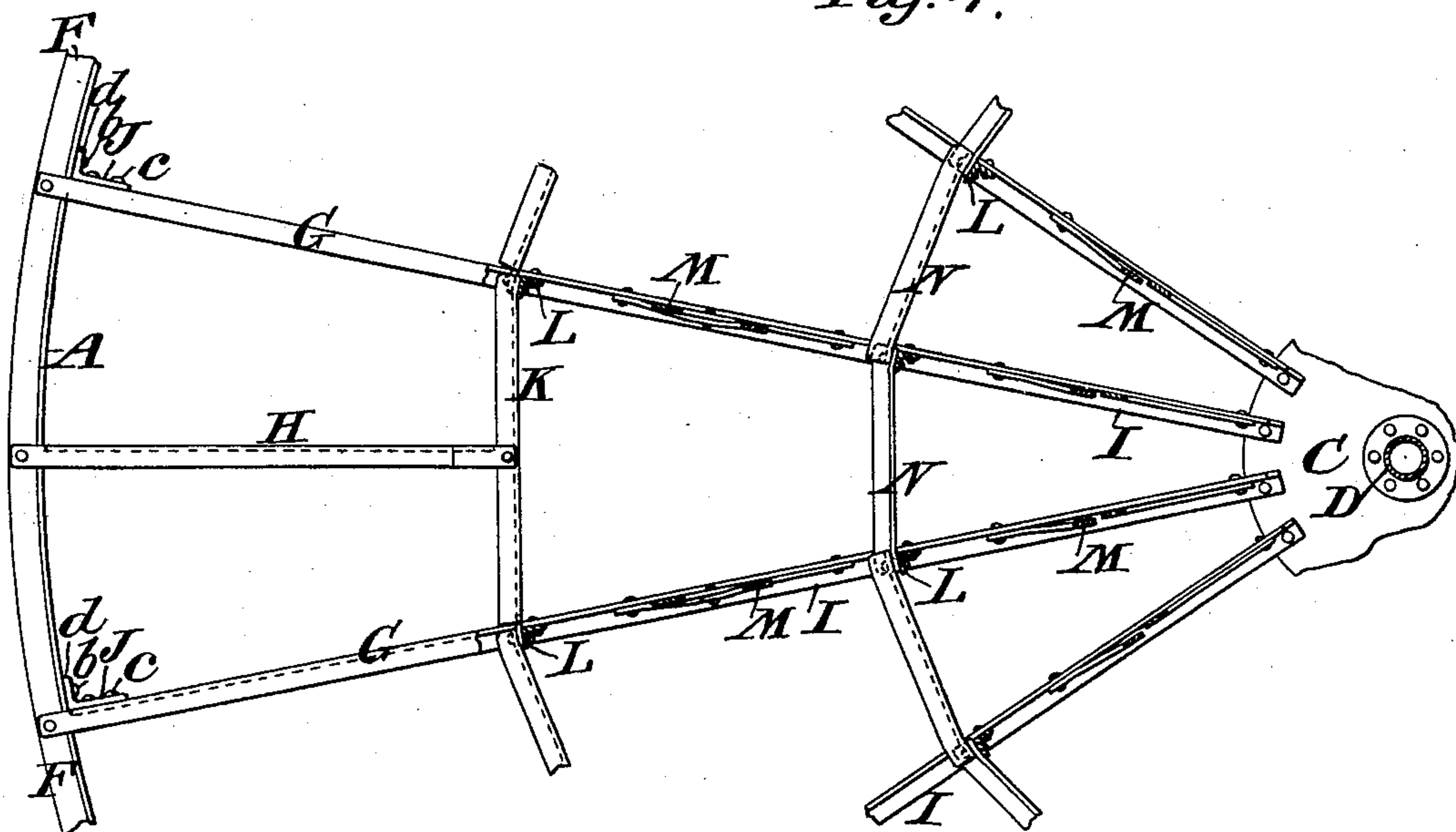
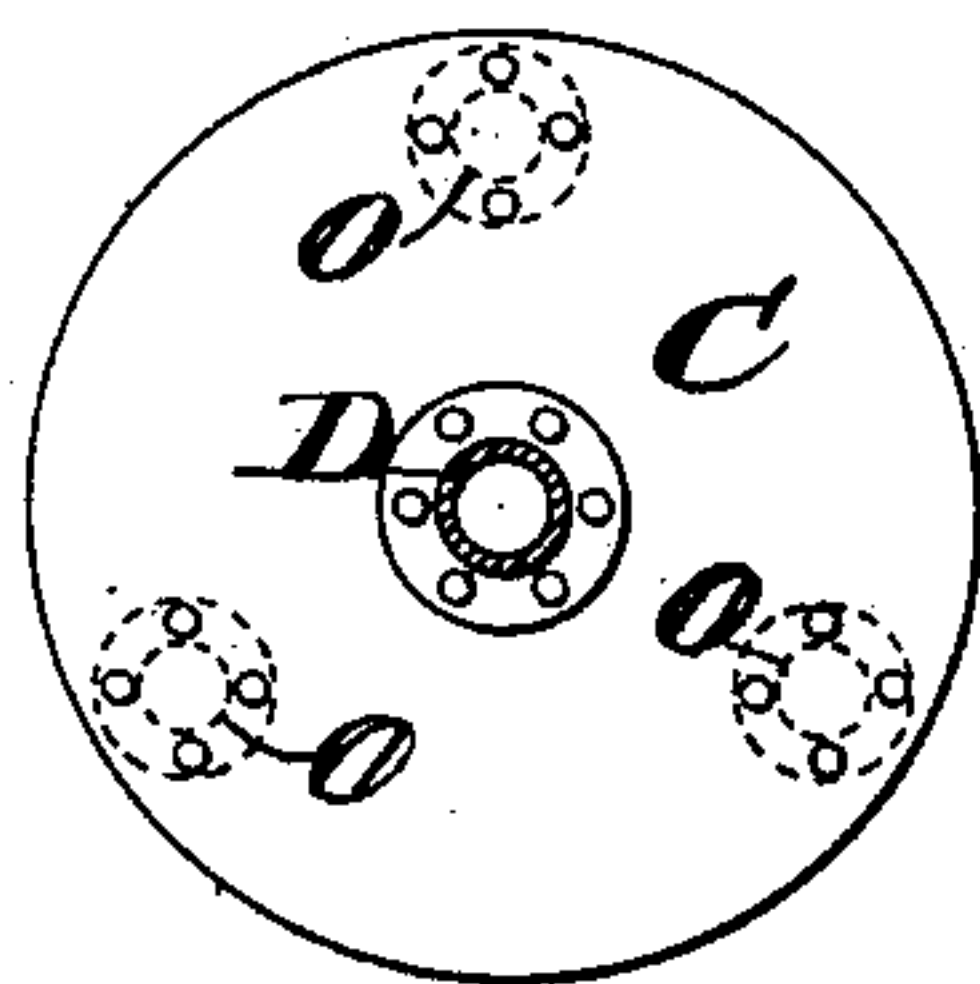


Fig. 5.



Witnesses:
O. Sundgren
George Barry.

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Christopher Cunningham
by attorneys
Brown & Seward

UNITED STATES PATENT OFFICE.

CHRISTOPHER CUNNINGHAM, JR., OF BROOKLYN, NEW YORK.

CIRCULAR-ROOFED STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 481,347, dated August 23, 1892.

Application filed March 30, 1892. Serial No. 427,029. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER CUNNINGHAM, Jr., of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Circular Tanks and other Circular-Roofed Structures, of which the following is a specification.

My invention relates especially to oil-tanks, gas-holders, and other circular-roofed structures of iron of large diameter; and its object is to obtain the necessary strength in the roofs of such structures with the least practicable weight of material.

To enable others skilled in the art to carry out my invention, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 represents a central vertical section of the roof and the upper parts of the side walls of a circular tank embodying my invention. Fig. 2 is a plan of the roof-frame corresponding with Fig. 1. Fig. 3 represents a vertical sectional view, on a larger scale than Fig. 1, of one-half of one member or section of the roof-frame. Fig. 4 is a horizontal section, in the line $x x$ of Fig. 3, of a portion of the framing; and Fig. 5 is a plan view of what is herein termed the "tie-beam plate."

Similar letters of reference designate corresponding parts in all the figures.

A designates the side wall of the tank, which is intended to be built up of iron plates, riveted together in the usual manner.

B is an upright post, which may be of iron tubing, erected in the center of the tank upon the bottom thereof or upon any suitable foundation therein and extending from said bottom or foundation up very nearly to a level with the top of the side walls A. On this center post B is placed a concentric circular plate C, hereinafter termed the "tie-beam plate," the upper end of said post being flanged for the support of said plate. Above this tie-beam plate, directly over the center post B, is a post D, which may be termed the "king-post," the said post being represented as flanged at its lower end to correspond with the flange of the center post B and being flanged at its upper end for the support of a concentric circular plate E, hereinafter termed the "crown-plate." The king-post and the center post are riveted or bolted together

through their corresponding flanges, and the tie-beam plate is by the same means secured between them. The crown-plate, which is represented slightly larger than the tie-beam plate, is also riveted or bolted to the flanged upper end of the king-post D. The upper edge of the wall A is surrounded by an angle-iron band F, which projects downward in the form of a flange and which is hereinafter termed the "wall-plate."

G G are rafters, which I have hereinafter termed the "main rafters," which are arranged radially between the crown-plate E and the wall-plate F and having their inner ends supported upon and riveted to the crown-plate and their outer ends supported upon the wall-plate. These rafters have an upward slope from the wall-plates toward the crown-plate corresponding with the intended pitch of the roof of the tank. Between the adjacent radial main rafters G G are placed and secured a series of purlins K, which serve to support the inner ends of short radial rafters H, the outer ends of which are supported upon the wall-plate F. These short radial rafters are arranged intermediately with the main rafters G and have a corresponding slope and they are riveted to the purlins and to the wall-plate.

I I are tie-beams arranged horizontally and radially between the plate C and the side walls A, one of said tie-beams being under each main rafter G. The inner ends of these tie-beams are supported upon and riveted to the plate C, and their outer ends are riveted, as shown at $a a$, to what are termed "gusset-plates" J, which are riveted, as shown at $b b$, to the side walls A, and also riveted, as shown at $c c$, to the rafters G. The said gusset-plates unite the side walls, the main rafters, and the tie-beams. These gusset-plates might be of heavy ordinary angle-iron; but I have represented them as made of plate-iron, one edge of which is turned at an angle to form a flange d , to be secured by the rivets b to the side wall A, such a plate providing for the longer and broader connection with the rafters G and tie-beams I than ordinary angle-iron would provide for.

Between each rafter G and the corresponding tie-beam below it are arranged and secured uprights, which may be termed "queen-posts"

L. Between these queen-posts, the crown-plate E and tie-beam plate C, between the said queen-posts and the gusset-plates J, and between the said queen-posts themselves are
 5 arranged crossing diagonal braces M M, connecting the rafters with their corresponding tie-beams. Between the adjacent tie-beams G are arranged a series of horizontal braces N.

The rafters, the tie-beams, the queen-posts,
 10 the purlins, and the horizontal braces above described may be of iron bars of any suitable transverse sectional form; but I have preferred to make them all of angle-iron. The diagonal braces may also be of transverse sectional form; but I prefer to make them of flat
 15 bar-iron. The riveted or bolted joints between the several parts may be made in any manner common to structures of such iron bars as are here used. Additional stability may
 20 be given to the structure by surrounding the center post B with a group of not less than three other supporting-posts upon which the tie-beam plate C may rest and receive additional support beyond that given by the cen-
 25 ter post. This is illustrated in Fig. 5, wherein three such additional posts O O are represented in dotted outline.

What I claim as my invention, and desire to secure by Letters Patent, is—

30 1. The combination, in a circular tank or

roofed structure, of a central roof-supporting post B, a central king-post D, erected above said post B, a crown-plate E, concentric with said posts, supported on said king-post, a concentric tie-beam plate C between said central
 35 supporting-post, a flanged wall-plate F, surrounding the side walls of the structure, inclined radial rafters G G, supported by said crown-plate and wall-plate, and radial tie-beams I, connecting the walls of the structure
 40 with said concentric tie-beam plate C, substantially as herein set forth.

2. The combination of the central post B, the side walls A, the central king-post D, the concentric crown-plate E, and tie-beam plate
 45 C, the flanged wall-plate F, the radial inclined main rafters G, connected with the concentric crown-plate E, the radial tie-beams connected with the concentric plate C, the flanged gusset-plates J, connecting both the rafters G and
 50 the tie-beams C with the side walls A, the purlins K, connecting the main rafters G, and the intermediate or radial rafters H, connecting the purlins K with the flanged wall-plate, all substantially as herein set forth.

CHRISTOPHER CUNNINGHAM, JR.

Witnesses:

FREDK. HAYNES,
 GEORGE BARRY.