C. DORNIER.

ROTATABLE AIRSHIP SHED.

APPLICATION FILED SEPT. 24, 1913.

1,241,720.

Patented Oct. 2, 1917.

4 SHEETS—SHEET 1.

Fig. 3.

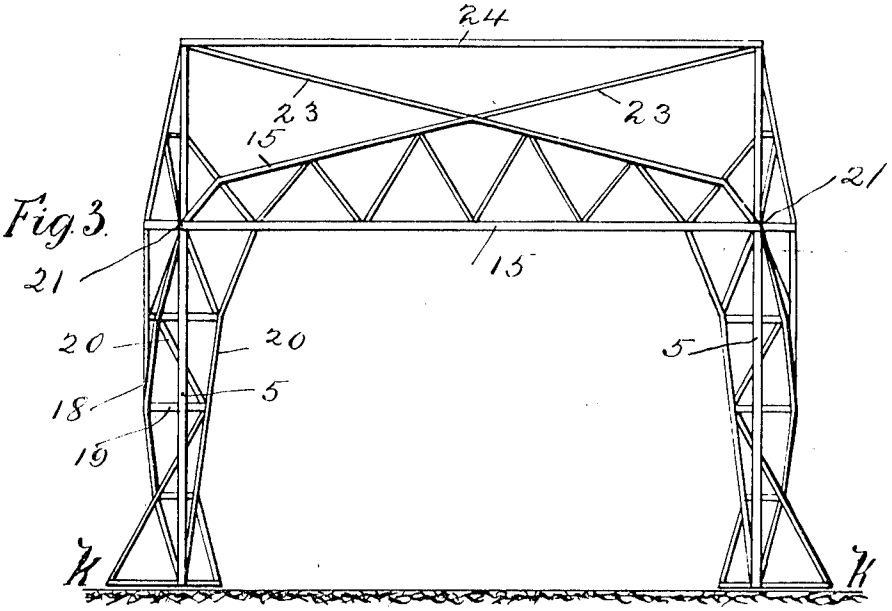
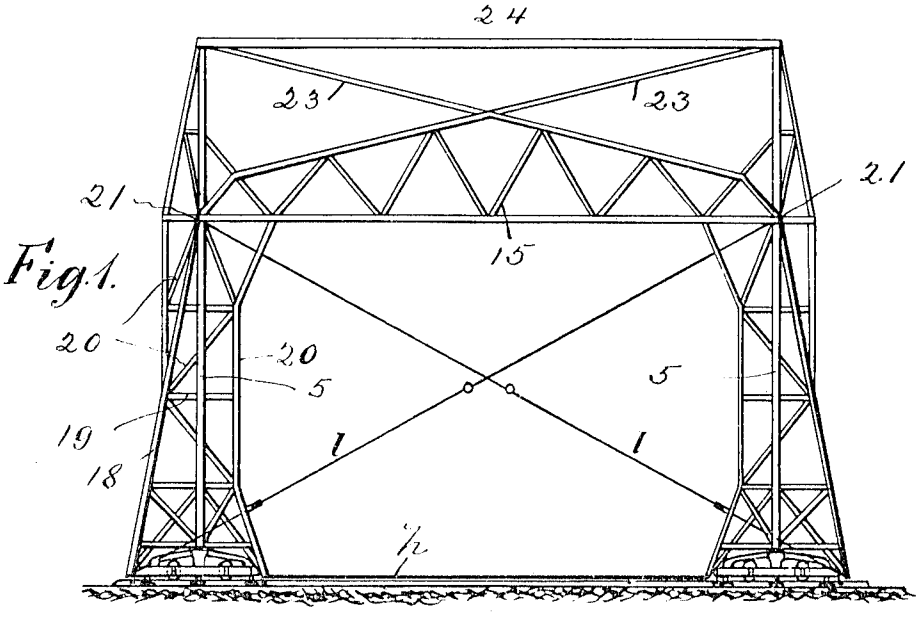


Fig. 1.



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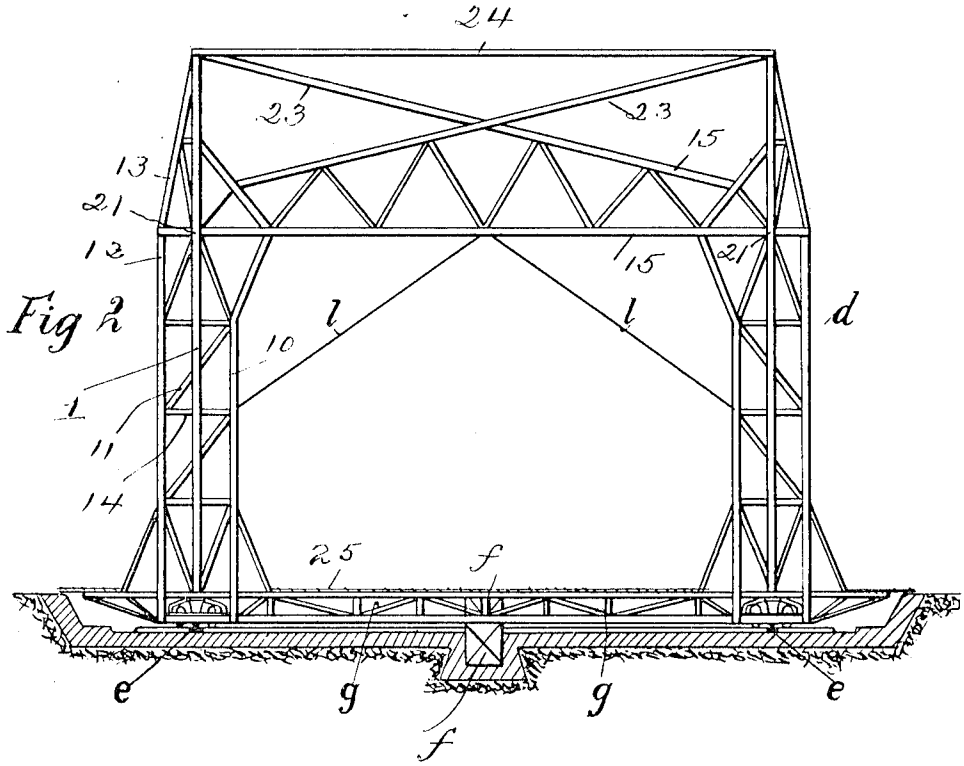
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4 SHEETS—SHEET 2.

Fig 2



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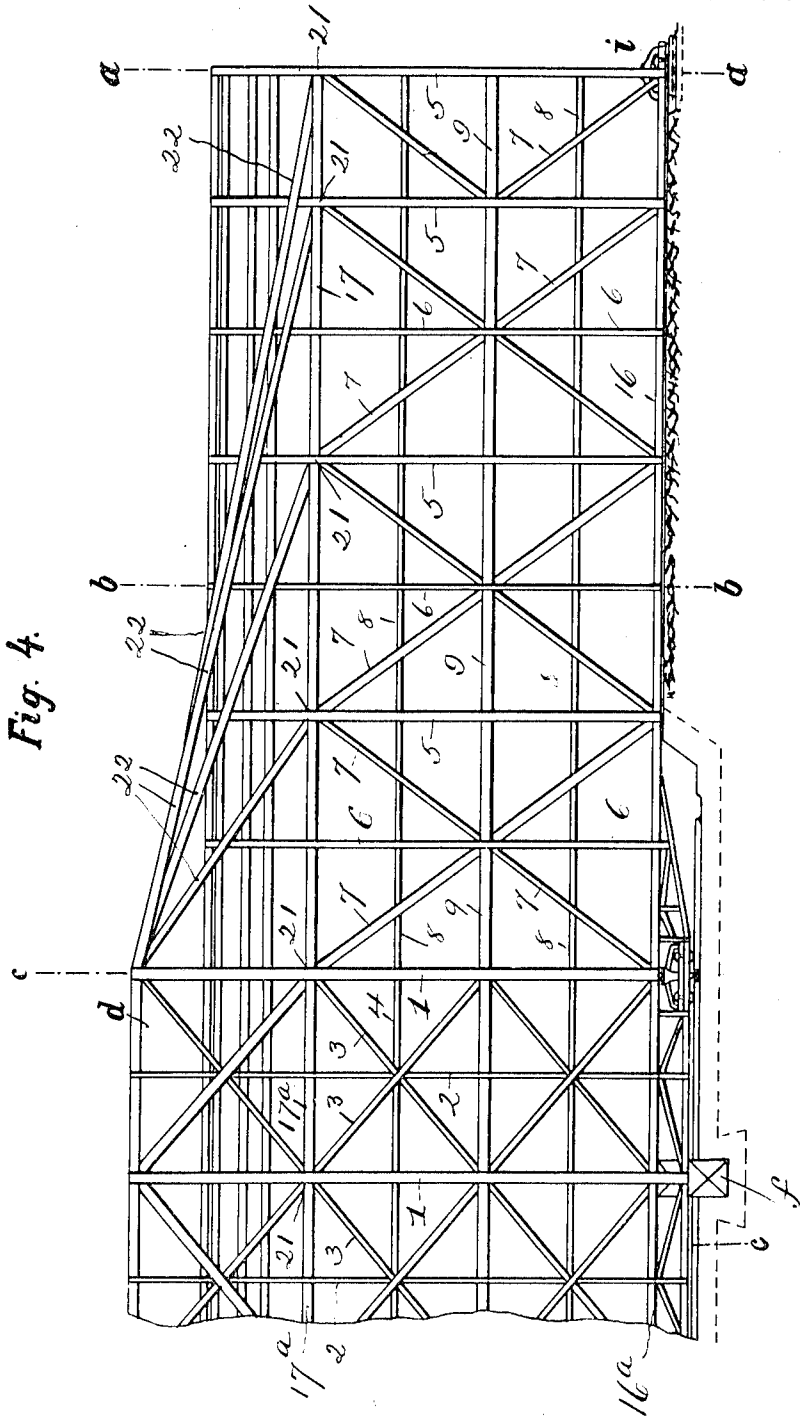
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4 SHEETS—SHEET 3.

Fig. 4.



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4 SHEETS—SHEET 4.

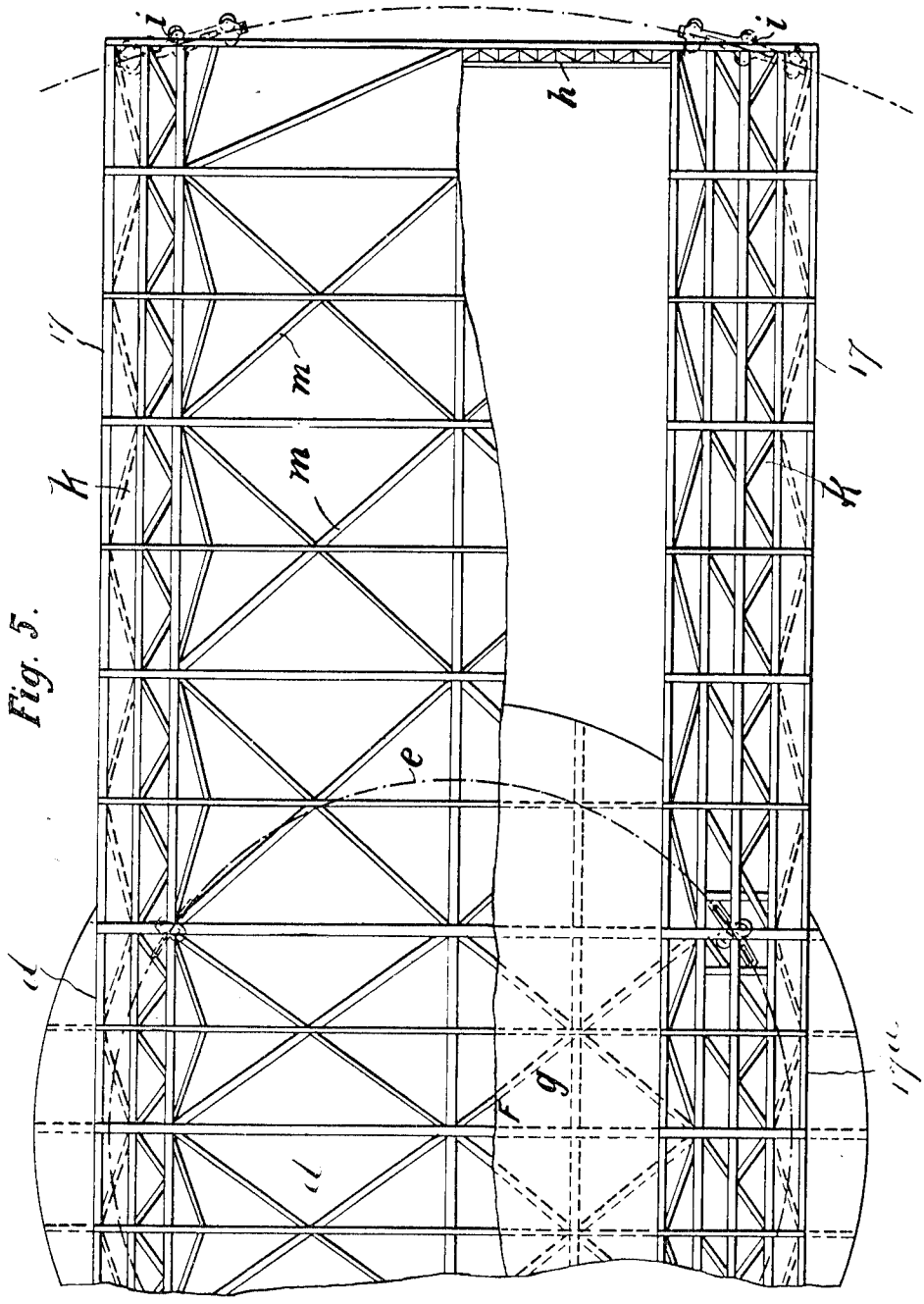


Fig. 5.

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UNITED STATES PATENT OFFICE.

CLAUDE DORNIER, OF FRIEDRICHSHAFEN, GERMANY, ASSIGNOR TO THE FIRM OF LUFTSCHIFFBAU ZEPPELIN G. M. B. H., OF FRIEDRICHSHAFEN, GERMANY.

ROTATABLE AIRSHIP-SHED.

1,241,720. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed September 24, 1913. Serial No. 791,526.

To all whom it may concern:

Be it known that I, CLAUDE DORNIER, a subject of the King of Wurttemberg, residing at 3 Neugartenstrasse, Friedrichshafen, Germany, have invented certain new and useful Improvements in Rotatable Airship-Sheds; and I do hereby declare the following to be a full, clear, and exact description of the invention, of which the following is a specification.

The subject matter of my invention is a "rotatable airship shed" which is open below and is constructed on the outrigger principle.

When airship sheds are stationary, airships can be safely conveyed into and out of the same only when the direction of the wind differs but little from the direction of the longitudinal axis of the shed. It has been attempted heretofore to obviate this defect by placing the sheds on wheels. It has been found, however, that such rotary sheds are exceedingly heavy and expensive. In addition, owing to their great weight they are very hard to turn, so that the advantage of sluability under certain circumstances becomes illusory.

A primary object of this invention is materially to reduce the weight of rotatable airship sheds and their salvage apparatus and to obviate various other disadvantages attached to rotatable sheds known heretofore.

To these ends, the invention consists in the construction, arrangement and combination of parts described hereinafter and pointed out in the claims.

One illustrative embodiment of the invention is represented by way of example in the accompanying drawing, wherein:

Figure 1 is a vertical section taken on the line *a*—*a*,

Fig. 2 is a like section taken on the line *c*—*c*, and

Fig. 3 is a like section taken on the line *b*—*b* in Fig. 4;

Fig. 4 is a side elevation, and

Fig. 5 is a top plan view showing a shed according to the invention; in Fig. 5 the left hand part shows the upper wind bracing, while the right hand part is a horizontal section taken below the roof.

The first essential feature of the invention is a rotatable central or tower portion *d* formed as a rigid frame whose arrangement will be understood from Figs. 2, 4 and 5 in which 1 are the main posts, 2 the intermediate posts and 3 and 4 the web members or braces connecting the posts together. It will be noted that the posts 1, which take the compressive strains are not heavy single rolled elements, but are built up of structural iron of any desired rolled light shapes. These posts, more clearly shown in Fig. 2, are composed of suitable members 10, 11, 12, 13 and 14 assembled in the nature of a latticed structure. The tower structure *d* is but slightly higher than the extensions and the roof trusses, 15. The tower posts 1 bound main panels and are connected together to form these panels by the web members 2, 3 and 4, an upper chord 17^a and a lower chord member 16^a.

The side walls of the building are attached to the tower *d* as cantaliver beams fixed at one end to the side walls of the tower. These beams, or in reality, trusses, are composed of posts 5, top chords 17, lower chords, 16, whose extensions 17^a and 16^a form similar chords in the tower, and web members 7 and 8, there being intermediate posts 6 similar to those 2 of the tower. The posts 5 extend above the upper chord of the trusses, as do also the posts 1 of the tower structure. The posts 5 are built up in a manner similar to posts 1, of a main upright 5 braced by the members 18, 19, 20 and 21, arranged in the form of a well known type of bow-string truss. The side beams or trusses, and, in addition, may be relieved by ties 22, proceeding from the highest part of the rotatable tower and connected to the panel points 21. The roof trusses 15 are supported at their ends at the panel points of the side wall beams or trusses. These trusses have their peaks connected by tension members 23, preferably extending in line with the upper chords of the roof trusses, to the upper ends of the posts 1 and 5 and to the intermediate posts 2 and 6. The upper ends of all posts projecting above the roof are cross connected by members 24. This arrangement enables all the vertical loads to be transmitted to the foundations relatively near the center of rotation through the rotation roller path *e*. The shed can consequently be slued more

readily as compared with sheds running on a number of concentric rotation roller paths. In addition, the foundations can be made of more favorable dimensions.

The second principal feature of the invention consists in the shed being made open below.

Owing to the great breadth of at least 30 meters which such buildings must have, a great deal of material is required for the construction carrying the floor. In addition, the construction supporting the floor must have a certain elevation. Consequently, a very undesirable difference of level between the ground and the floor of the shed results or, in the event of a sunken construction being employed, the cost of building is materially increased owing to the large quantities of earth which have to be moved. These defects are obviated owing to the floor being done away with; in addition, the cost of manufacture is very materially reduced.

As shown in Figs. 2 and 5, for transmitting horizontal forces to the king journal *f* the rotary tower *d* is provided with a sunken construction *g* which is covered over in so far as the same must be walked over with a floor 25. In addition, members *h* for connecting the sets of wheels *i* are arranged below between the free ends of the walls. These connections, however, can be placed so low that they constitute no obstruction at all. Under certain circumstances, these connections and the intermediate construction in the rotary tower can be omitted.

The forces of the wind are transmitted in the plane of the top flange or chord of the beams constituting the walls through bracing *m* which extends the entire breadth of the building and is indicated in the left-hand half of Fig. 5. In addition to the wind bracing *m* of the roof panels, the side walls of the tower portion are provided with the diagonal web-members 3, and the overhanging or cantaliver portion is provided with the diagonal members 7 acting as wind bracings for these portions. Horizontal forces are transmitted in the plane of the bottom flange of the walls by the outside struts *k* which is fastened to the side of the tower and whose outside ends are supported on the sets of wheels *i*. Braking devices at these sets of wheels admit of horizontal reactions being taken up.

The described construction can be employed for sheds which are used for constantly containing airships, and also for harboring airships in radially arranged stationary sheds. For the latter case it is provided, in addition, that the covering of the walls and roof, which may consist of canvas, can be reefed after the shed has been used. Since, in general, airships do not travel when the wind has a velocity exceeding 16 meters per second the height regulation assumptions of load of 150 kilograms per square meter for wind and the snow load of 75 kilograms per square meter have to be taken into account only for the uncovered surfaces of the iron framework, so that a material saving of expense is obtained.

In addition, when the ship is moved into or out of the shed and before the shed is swung to the wind, bracing members 1 or guys at the ends of the shed are removed to permit the ship to enter and leave the shed. The guys cause the construction to be relieved and stiffen it when in place.

In order to relieve the tower when the shed is in its normal position of rest solid foundations may be provided for the side walls in a direction corresponding to the position of rest, said foundations being so arranged that when the hall is slued into this position of rest, the side walls provided with suitable supports, rollers or the like are supported by these foundations. Concentric rails are preferably provided on the foundations for these rollers or the like, which rails may have inclined faces so that when the rollers run up the same the side walls are lifted somewhat in order effectively to relieve the king journal or supporting rollers of the tower. A firm floor may be provided between these foundations.

I claim:

1. An airship shed comprising in combination a rotatable tower having a central through passage, and beams constituting side walls of the shed suspended from the tower by being fixed at one end thereto.

2. An airship shed comprising in combination a rotatable tower having a central through passage, and walls fixed at one end to and carried by the tower, and a roof carried by the walls, the chamber bounded by the walls and roof being open below.

3. An airship shed comprising in combination a rotatable tower having a central through passage, and beams constituting side walls of the shed suspended from the tower by being fixed at one end thereto, and ties connecting the walls with the top portion of the tower.

4. An airship shed comprising in combination a rotatable tower, and beams constituting side walls of the shed suspended from the tower being fixed at one end thereto and forming an unobstructed passage from end to end of the shed, and wind bracing extending the entire width between the beams and attached to the upper part of the tower and to the beams.

5. An airship shed comprising in combination a rotatable tower having a central through passage, and walls fixed at one end to and carried by the tower, and a roof carried by the walls, the chamber bounded by the walls and roof being unobstructed and

open below, and wind bracing attached to the tower and extending between the top of the walls and to the bottom of the walls.

6. An airship shed comprising in combination a rotatable tower having an unobstructed central chamber, and beams constituting side walls of the shed suspended from the tower by being fixed at one end thereto and forming a continuation of the tower chamber, a rotation roller path, wheels carrying the tower and movable on the roller path, and wind bracing attached to the tower and supported by said walls.

7. An air-ship shed comprising in combination, a tower structure having a clear passage therethrough, means to rotatably mount the tower, parallel cantaliver latticed beams supported by the tower and projecting in opposite directions from the tower and forming the side walls of the shed and between them a chamber continuous with said passage, a roof structure carried by said beams and removable crossed guy members connecting the free cantaliver ends.

8. An airship shed comprising in combination a rotatable tower having an unobstructed central chamber, walls fixed at one end to and carried by the tower, and a roof carried by the walls, the chamber bounded by the walls and roof being open below and forming a continuation of the tower chamber, and readily detachable guy members normally connecting the ends of the walls remote from the tower, for the purpose specified.

9. An airship shed comprising in combination a rotatable tower, and beams constituting side walls of the shed suspended from the tower by being fixed at one end thereto, in combination with foundations adapted to support the bottom flanges of the side walls in the normal position of rest of the shed.

10. An airship shed comprising in combination a rotatable tower, and beams constituting side walls of the shed suspended from the tower by being fixed at one end thereto, in combination with two foundations for supporting the bottom flanges of the side walls in the normal position of rest of the shed, and a floor constructed between said foundations.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

CLAUDE DORNIER.

Witnesses:
ERNEST ENTENMANN,
FRIDA BLAIBER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."