April 8, 1930. G. BETANCOURT 1,753,592

AIRSHIP TERMINAL

Filed May 9, 1927 2 Sheets-Sheet 1

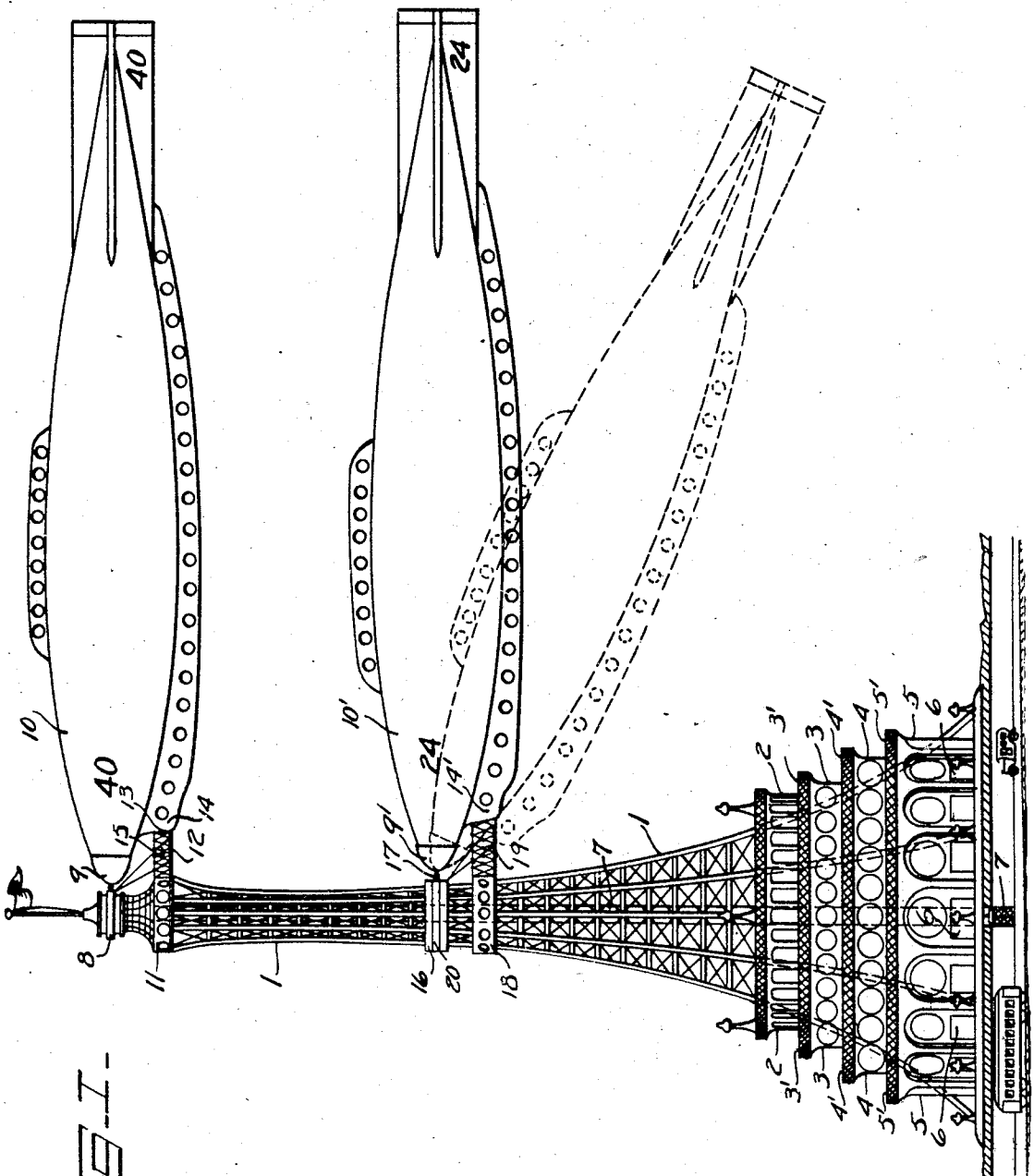


FIG. 1.

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Filed May 9, 1927 2 Sheets-Sheet 2

FIG. II.

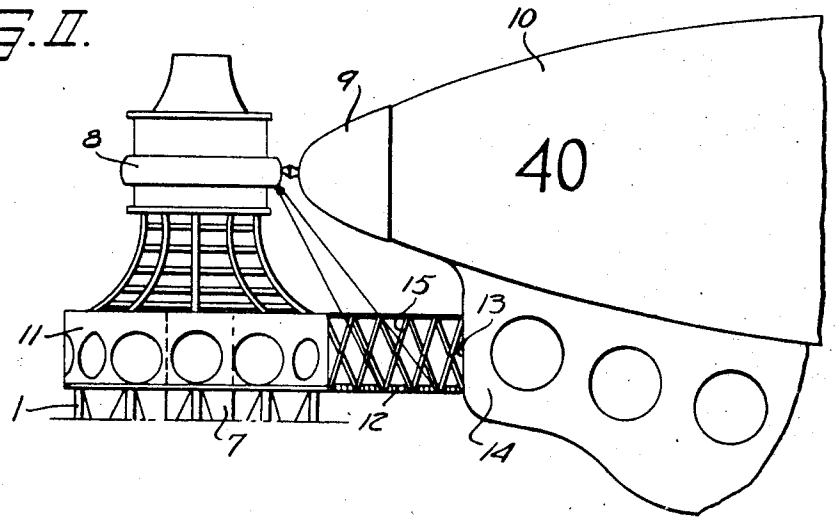
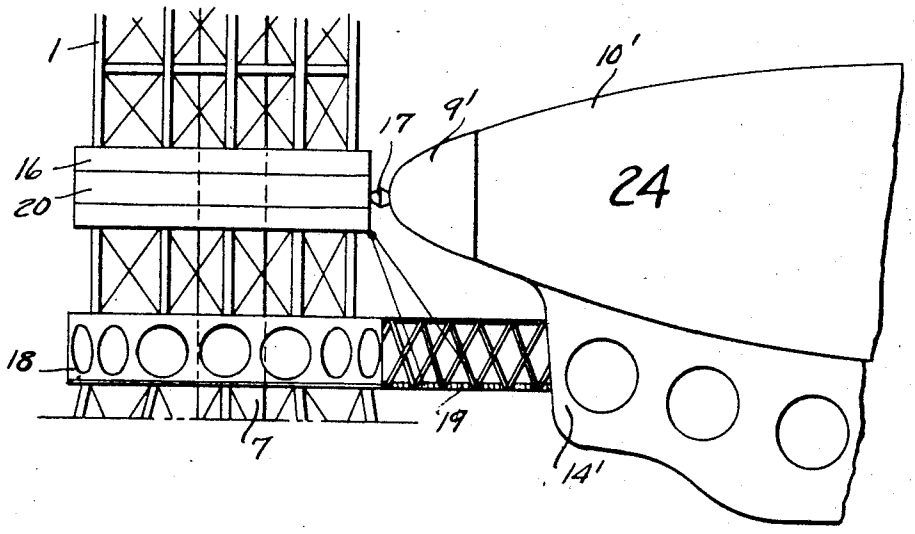


FIG. III.



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UNITED STATES PATENT OFFICE

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AIRSHIP TERMINAL

Application filed May 9, 1927. Serial No. 189,962.

This invention relates to an airship terminal, and among its objects are the provision of suitable tower to which one or more airships may be temporarily moored by the bow and permitted to swing by-the-wind, to provide coordinated facilities to handle passengers to and from airships so moored in conjunction with land traffic bringing the passengers to the terminal and to provide all of the facilities necessary or desirable for the accommodation at the terminal associated with the mooring tower for passengers and terminal organization, for the most convenient handling of passengers and goods as may be required for a depot or terminal. It will be noted that the entire terminal aims to accommodate all of the necessary or desirable requirements as hereinafter more fully described, and in particular to provide features of mooring of airships to assure their adjustability with respect to the mast both as to elevation and swinging by-the-wind, and the adjustment of communication between the tower and the airships, all as hereinafter more particularly set forth.

One embodiment of my invention is shown in the accompanying drawings, in which:

Fig. I is a side elevation of the complete terminal and mooring tower showing two airships moored thereto, and illustrating how the dip of one ship, shown dotted, is accommodated owing to the characteristics of my mooring tower and equipment.

Fig. II is a side elevation, on enlarged scale, of the top mooring station, fragmentary, with a portion of an airship's bow.

Fig. III is an enlarged side elevation of a second mooring station on the tower, fragmentary, with a portion of a ship's bow shown as moored thereto.

The air ship terminal as shown in elevation in Fig. I, has the tower portion 1 surmounting a base formed in tiers 2—3—4—5, each of which may have balconies such as 3′—4′—5′, and are built up from foundations with entrances such as 6—6 for passengers and central elevator or elevators in a shaft 7. The foundation may be built over a street so that conveyances can run on street level to the lower tier of the terminal, and one or more elevators can run down even to a subway, if desired, in case my terminal is built where it taps various forms of city traffic. One of my designs aims to provide such a terminal at the lower end of Central Park, New York, with subway connections east and west, in a manner that would be ornamental to the location without in any way interfering with the surrounding surface of the park, and still accessible for road and track vehicles for the traffic to and from the teminal.

These lower floors would accommodate waiting rooms and any usual or desired service equipment, with the ticket office and customs' service preferably on the upper floor, so that it will be closest to the ships and to the incoming traffic for the convenience of passengers and officials. Likewise the meteorological and aeronautical operating service would be accommodated in the tower base, or at other places where observation would be required, with, of course, suitable guiding lights for aircraft.

In a particular design I contemplate a tower of one thousand feet in height with accommodations to moor one ship at approximately that elevation, while provision is also made for the mooring of a second ship at an approximate altitude of six hundred feet.

Thus the terminal would be in the nature of a monumental structure, and, as shown, would be an artistic architectural edifice besides its particular utility as a terminal and mooring tower for its primary purpose. It would also serve for observation, and in general design and monumental character has in part been aimed as a memorial to the great tower builder Gustave Eiffel, and, on the other hand the great rigid airship builder Count von Zeppelin.

The particular features of construction being the combination of a combined terminal with special advantages for all of the business requirements, and the connections for embarking and disembarking from airships and the mooring of the ships and interconnections with the tower for the loading and unloading of passengers, supplies and freight.

Thus the topmost mooring comprises a

ring structure 8 secured and rotatable around a section of the tower and having means for permitting vertical adjustment. Suitable ship nose mooring 9 connects the airship 10 with this rotatable and vertically adjustable ring. At a suitable distance below the ring is a balcony or annular rotatable platform 11 with means adapted to support an extensible gangway 12 adapted to engage and be temporarily secured at 13 with the forward cabin 14 of the airship. As airships of different sizes and dimensions will be accommodated, the platform 11 suitable for passengers and crew, may be at a fixed elevation, so that the gangway 12 will reach without undue inclination the forward hatch or port of the ship's cabin, but in view of the likely difference in height between the cabin hatch and the nose or bow mooring point, the mooring ring 8 is adjustable for height and thereby accommodates different ships, and also provides for the accommodation of vertical adjustability of the mooring point relative to the cabin connection as the ship dips, or conversely as the stern rises or falls due to variation of trim. I provide for the nose coupling adjustability for different sizes of ships or for different conditions when moored, because such mooring point may be more readily adjusted than it would be possible to adjust or vary the height of the platform with its suitable accommodations for persons, and for freight or supplies being unloaded or awaiting embarking. The gangway 12 has extensible members so as to vary within limits the distance from tower loading platform 11 and the ship's cabin, and in the form shown this preferably is a series of lattice 15 capable of contraction for housing it against the tower platform, or for expanding and contraction when connected with the ship, and may be during the operation suitably supported from the ship's mooring ring 8 so as to carry the load of the gangway 12 until it is connected with the ship. However, lines may be cast from the ship and the gangplank drawn aboard for connection, with suitable construction throughout to accommodate the longitudinal flexibility and slight lateral flexibility. As the ship swings by-the-wind the mooring ring 8 accommodates this, and simultaneously the gangway and passenger platform 11 swings so as to provide uninterrupted communication to the ship.

In the case of mooring gear for a second ship, it will be noted, as shown, that airship 10′ is moored further down the tower and at a level in the range of six hundred feet approximately, when the upper ship is moored at an elevation of one thousand feet. It will be understood that mooring accommodations will in the future be required for ships of different lengths, and the relative position of different mooring gear on the tower will be determined by the requirements depending upon the size of ships to be accommodated. While there may be more than two mooring positions or at least passenger landing accommodations on the tower, the ship's bow mooring connection will be varied by being adjustable for height to accommodate not alone size, but also the probable variation in the shape of the ship's bow which may cause the nose to be more or less higher than the cabin, and the design of the cabin may in addition varying dimensions, all of which will be duly accommodated.

As shown, a second mooring point on the tower includes the ring 16 with nose mooring coupling 17 connecting with the ship's nose 9′. A platform 18 has an extensible gangway 19 to connect with the ship's cabin 14′. For a portion of the tower the outer members are cylindrical to carry the ring 16 in order that it may be adjustable for height, as desired, and at the same time permit rotation of the rings which may involve a central ring 20 carrying the nose coupling with the ring 16 vertically movable, or all together may be a group or a single ring, both adjustable for height and rotatable as well.

It will thus be seen that the entire terminal provides a tower for the mooring without any outside guys to interfere with the ship swinging by-the-wind, and the lower portion of the tower constitutes a building in fact with ample accommodations for the business involved at such a station or terminal, and accommodations for the passengers, and also may connect with surface traffic facilities admirably suited to bring land conveyances by surface or subway to the terminal, and with elevator connection throughout the different levels to provide all desired conveniences and all the requirements of a terminal for airships.

While many variations may be made without departing from my invention, and obviously dimensions will be varied in each case to suit circumstances, details of structure for proper resistance of loads and strains, particularly incident to the lateral tug of ships, will be suitably accommodated without disturbing the stability of the terminal in its other respects, but what I claim and desire to secure by Letters Patent is:

1. An airship mooring tower having a plurality of mooring stations at widely different elevations, one above the other, whereby the same tower may moor at the same time a plurality of ships, means for limited adjustability of height for each of the mooring means on the tower and a rotary loading platform at each at a fixed elevation.

2. In an airship mooring tower a plurality of rotatable bow mooring connections, a loading platform around the tower below each mooring ring at a fixed elevation, and cooperating extensible gangways extending

from the loading platform for variable distance engagement with the moored ship.

3. An airship terminal comprising a tower self-supporting without outside guys to interfere with an airship swinging completely around the same, a mooring ring rotatably supported around the outside of said tower and means of support therefor adapted for limited vertical adjustment, a rotary platform supported below said mooring ring having variable means for connection with the ship, and adapted to swing with said connections simultaneously with the mooring ring around the tower.

4. A mooring tower for airships having a plurality of loading platforms, spaced substantially apart vertically and each having mountings permitting rotation about the tower, a ship's vertically adjustable mooring connection above each of said mooring platforms and simultaneously rotatable around the tower.

5. An airship mooring terminal having a plurality of mooring stations at different heights above the ground separated relatively to permit simultaneous mooring of two ships at the same time, a multi-storage structure embodied in said terminal and elevator connections between the floors of the structure and the mooring stations above, a rotary platform on the outside of the structure forming part of each mooring station and an adjustable ship mooring connection above each rotary platform, whereby the interior elevators afford constant communication with the mooring stations and the floors of the building and through the mooring station to a ship moored thereto.

In testimony whereof, I have signed my name to this application this 5th day of May, 1927.

GILBERT BETANCOURT.