(No Model.) 2 Sheets—Sheet 1.

A. GUERRA.

OBSERVATION TOWER WITH ROTATING CAR.

No. 548,122. Patented Oct. 15, 1895.

FIG. 1.

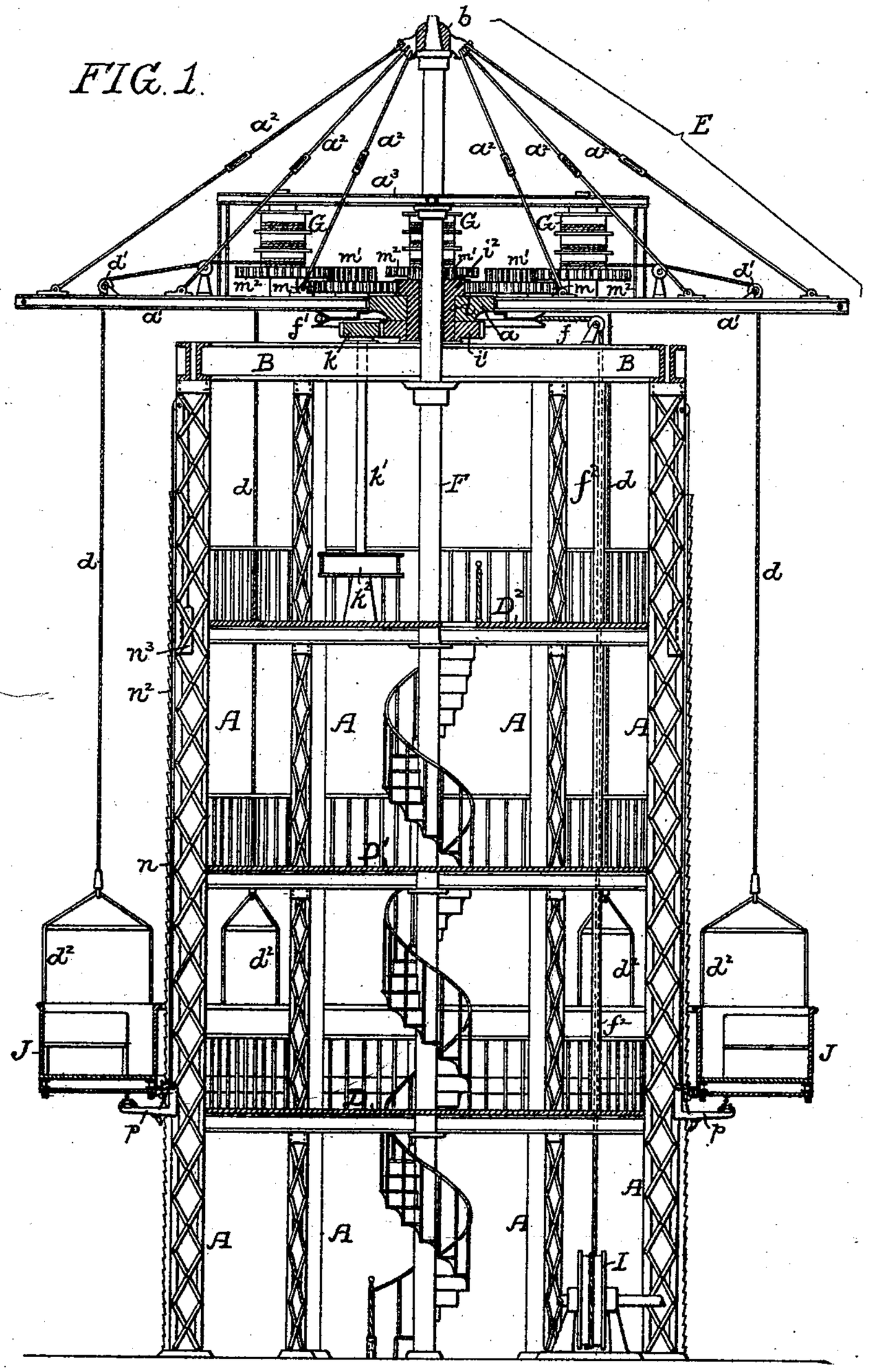
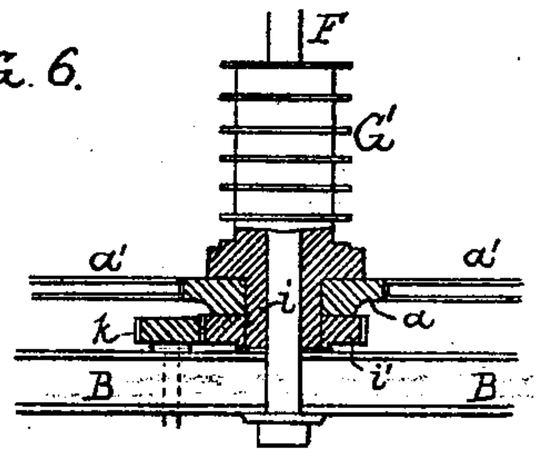


FIG. 6.



Witnesses
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Hamilton D. Turner

Inventor
Asterio Guerra.
by his Attorneys
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(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

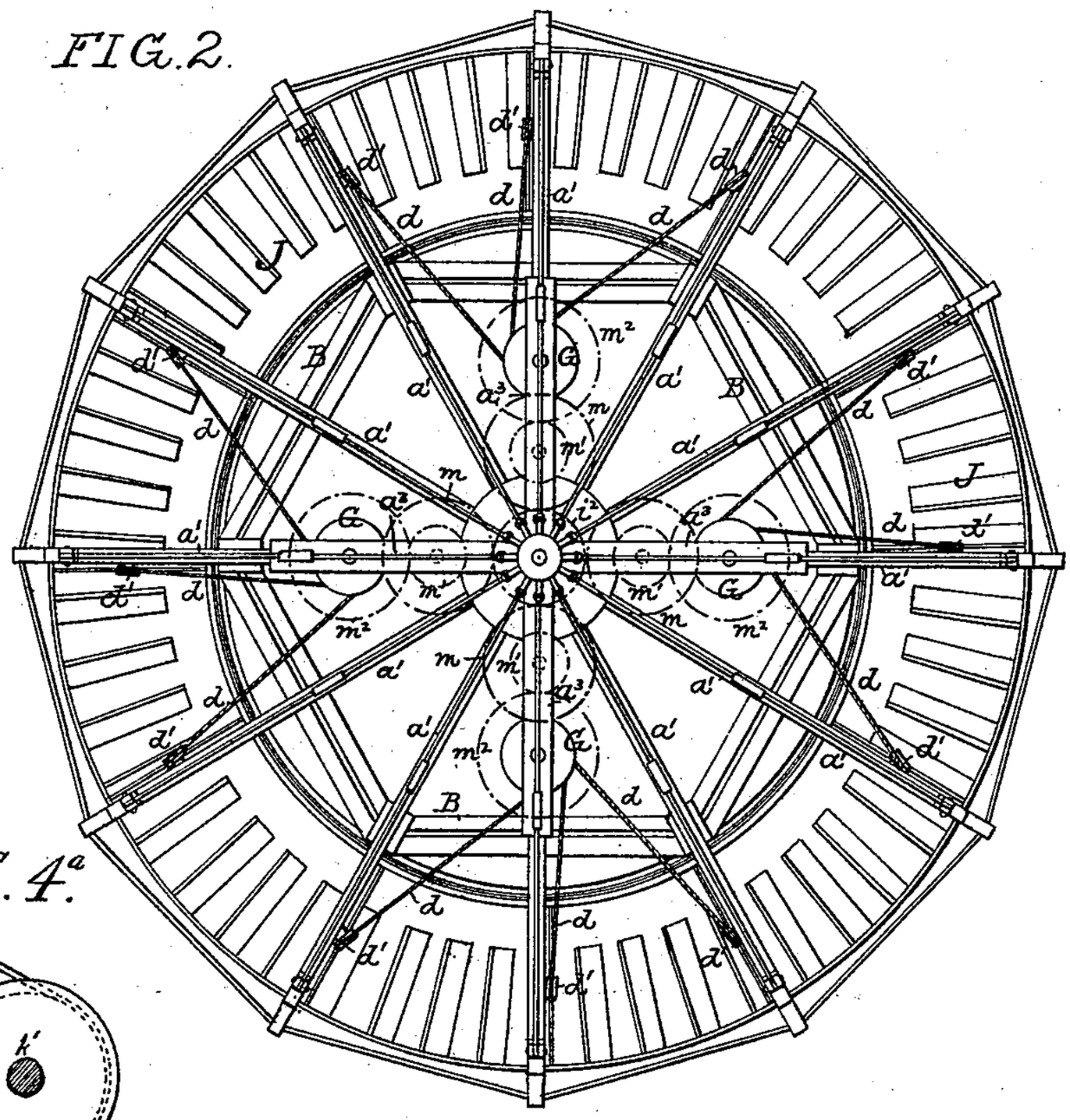


FIG. 4ª.

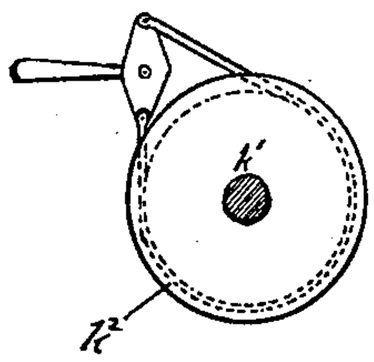


FIG. 3.

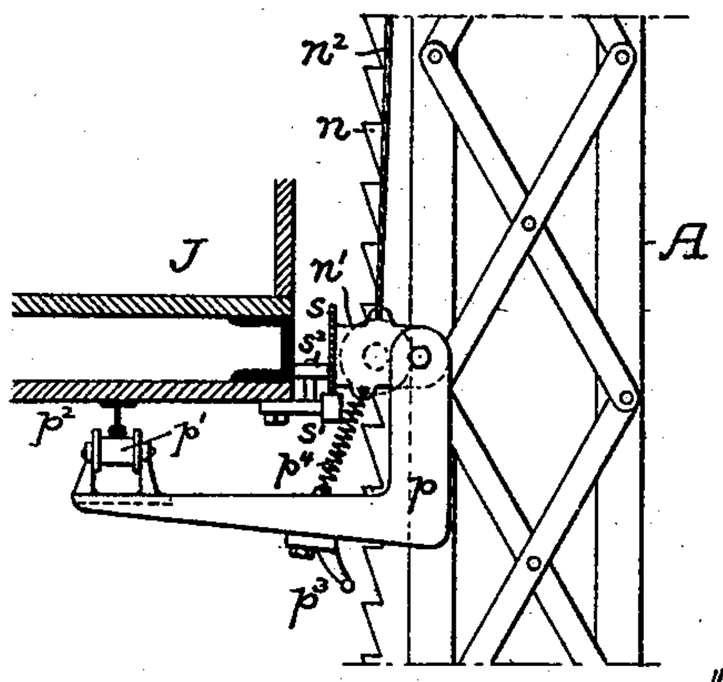


FIG. 4.

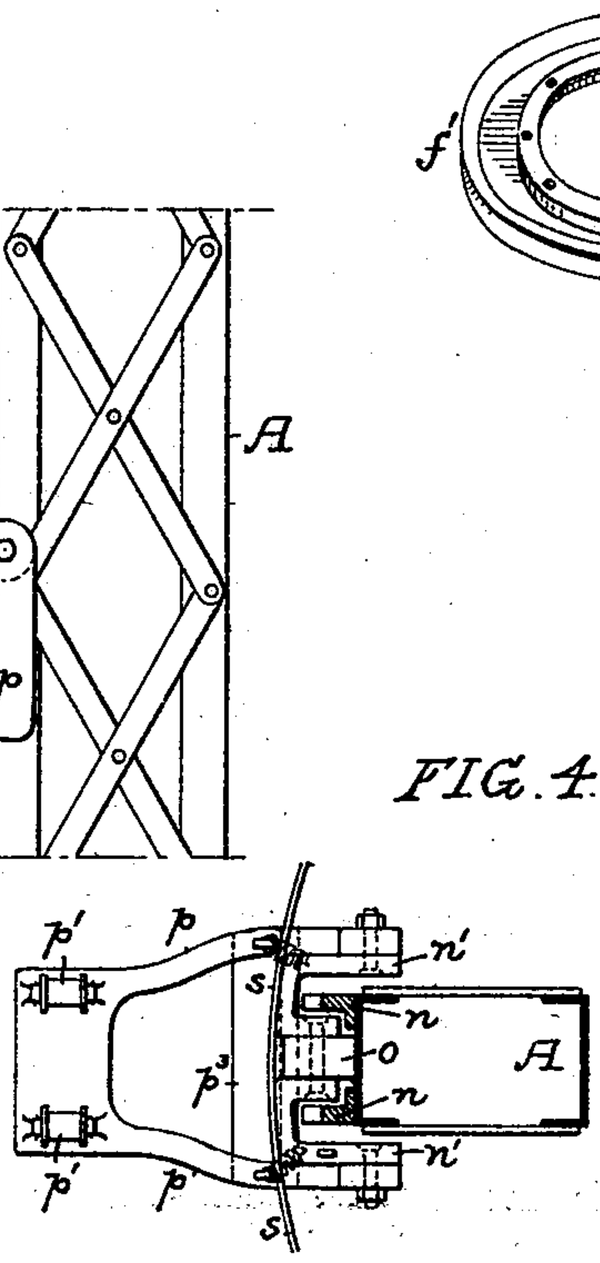
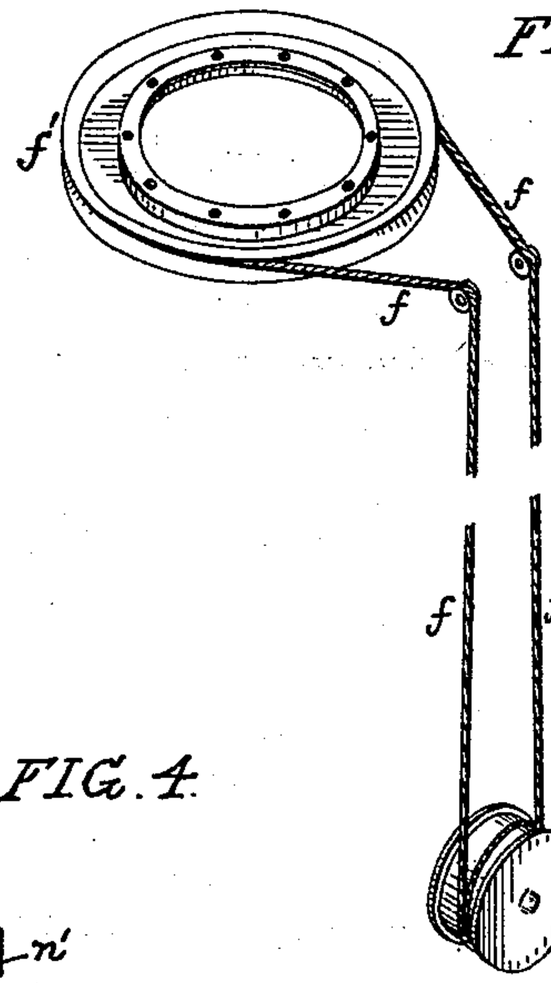


FIG. 5.



Witnesses
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Hamilton D. Turner

Inventor
Asterio Guerra
by his Attorneys
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UNITED STATES PATENT OFFICE.

ASTERIO GUERRA, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF THREE-FOURTHS TO FREDERIC J. EULER AND EDWARD J. BROPHY, OF SAME PLACE.

OBSERVATION-TOWER WITH ROTATING CAR.

SPECIFICATION forming part of Letters Patent No. 548,122, dated October 15, 1895.

Application filed March 14, 1895. Serial No. 541,675. (No model.)

To all whom it may concern:

Be it known that I, ASTERIO GUERRA, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented an Observation-Tower with Rotating Car, of which the following is a specification.

The object of my invention is to so construct an observation-tower that the car or platform for the passengers will not only be raised and lowered, but will have a rotating movement while ascending and descending, thus giving the passengers a comprehensive view and combining the attractions of a roundabout with those of an observation-tower. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a transverse vertical section, partly in elevation, of an observation-tower with rotating car constructed in accordance with my invention. Fig. 2 is a plan view of the same, in which, to prevent confusion, certain spur-wheels are represented simply by dotted circles. Fig. 3 is an enlarged side view, partly in section, of a portion of the structure illustrating the construction of a safety-catch employed in connection therewith. Fig. 4 is a plan view, partly in section, of the devices shown in Fig. 3. Fig. 4ª is a plan view of a certain breaking device forming part of the controlling mechanism of the hoisting-gear. Fig. 5 is a diagram illustrating the means employed for rotating the car-hanger, and Fig. 6 is a view illustrating a modification of part of the invention.

The fixed portion of the structure is a tower consisting of a series of upright columns A of any suitable structural form, these columns being properly connected and braced by means of girders B at the top and by a series of platforms D, D′, and D^2 at different levels.

A central column or post F extends above the top of the tower and serves for the support of the rotating car-hanger E, which consists of a hub a, with a series of radiating arms a', suitably braced and connected by tie-rods a^2 to a block supported upon the top of the central post F, but free to turn thereon. As shown in the drawings, there are twelve of these arms a', but a greater or less number may be used, as desired. Each arm has a sheave or pulley d' for the guidance of a hoisting rope or cable d, the upper end of each hoisting-rope being wound upon one of a series of drums G, these drums being mounted upon shafts carried by the arms a' and by a framework a^3 above the same. In the present instance there are four drums, and each drum is composite—that is to say, threefold—and receives three hoisting-ropes; but the number of drums employed is immaterial, as there may be a less number of drums each receiving a greater number of hoisting-ropes or a greater number of drums each receiving a less number of hoisting-ropes.

The lower ends of the hoisting-ropes d are connected by yokes d^2 to the car J for the passengers, this car in the present instance being an annular structure surrounding the central tower, although the car may, if desired, be made in sections guided or connected so as to preserve their proper relation to each other. Hence the term "car" applies either to a continuous or sectional structure.

The car-hanger is driven by means of an endless rope or cable f, adapted to a drum or pulley f', suitably secured to the arms a' or hub a, the two runs of said driving-belt f passing down through suitable boxes or casings f^2 on the tower to a driving-drum I, around which the rope passes one or more times, so as to insure the proper hold of the drum thereon.

Passing through the hub a is a sleeve i, which has below the hub a spur-pinion i' and above the hub a spur-pinion i^2. The pinion i' meshes with a spur-wheel k at the upper end of a shaft k', which extends downward to the upper platform D^2, and has upon it a friction-drum k^2, to which is adapted a frictional band, which may be provided with any ordinary form of mechanism for tightening or loosening the same. (See Fig. 4ª.) The upper pinion i^2 meshes with a series of spur-wheels m, mounted upon short upright shafts or spindles carried by the arms a', and secured to or forming part of each of these spur-wheels m is a spur-pinion m', which meshes with a spur-wheel m^2 on one of the winding-drums G.

Supposing that the car J is at the bottom of the tower and the hoisting-ropes are unwound from the drums, the car-hanger E is caused to rotate and the car suspended therefrom rotates with it.

As long as the sleeve *i* is permitted to turn there will be no elevation of the car J, but as soon as it is desired to cause the ascent of the car while the same is still rotating the rotation of the sleeve *i* is arrested or retarded by applying friction to the drum k^2, so as to either stop or retard the rotation of the same.

When the rotation of the sleeve *i* is thus stopped or retarded, the engagement of the spur-wheel *m* with the spur-pinion i^2 of said sleeve will, owing to the rotation of the car-hanger carrying said spur-wheel *m*, cause the rotation of the latter, and hence of the pinions *m'* and spur-wheels m^2, thus imparting motion to the drums G and causing them to wind up the ropes *d*, and consequently raise the car, the maximum speed of lift being attained if the rotation of the sleeve *i* is wholly stopped, and there being a correspondingly less speed of lift if the sleeve *i* is permitted to rotate at a less speed than the car-hanger. Hence the speed of lift is under the control of the attendant who operates the friction-band adapted to the drum k^2.

When the car has been lifted and it is desired to permit the same to descend while still continuing its rotation in the same direction as during the ascent, the friction upon the drum k^2 is removed or so lessened that the sleeve *i* is permitted to rotate at a greater speed than the car-hanger, the weight of the car and its load causing the unwinding of the hoisting-ropes from the drums G and the turning of the latter being transmitted through the spur-gearing to the sleeve *i*, thereby causing the same to turn more rapidly than the car-hanger.

Owing to the number of hoisting-ropes employed the falling of the car is practically impossible, as the car cannot fall unless all of the ropes are broken; but in order to guard against even such a contingency and also to prevent undue speed of descent in case of accident to the friction-brake or other part of the speed-controlling apparatus, or the undue tipping or tilting of the car in case of the breaking of ropes at one side of the structure, or to prevent the fall of any section of a car, if the same is made in sections, I employ a safety device. (Best shown in Figs. 3 and 4.)

On the outer side of each of the columns A are racks *n*, and embracing these racks and having a roller *o* running upon the outer face of the column between the racks are bent bars *n'*, carrying a lever *p*, which has a roller *p'*, occupying a position beneath an annular rail or bar p^2 on the bottom of the car, said lever also carrying a tooth p^3 for engaging with the racks *n*, the lever being normally held in such position by means of a spring p^4 that the tooth p^3 is free from engagement with the racks.

Each pair of slide-bars *n'* is connected by means of a cord n^2, passing over a suitable pulley at the top of the column A, to a weight n^3, which partially counterbalances the weight of the bars *n'* and the parts carried thereby. The series of bars *n'* carry an annular rail *s*, against the lower end of which bear antifriction-rollers *s'*, carried by arms projecting inwardly from the bottom of the car, other antifriction-rollers s^2 being interposed between the outer face of the rail and the inner side of the car. When the car is raised, therefore, it lifts the rail *s* and bars *n'* with it, and when the car descends the rail and bars follow the same, the speed of descent being comparatively slow. If, however, there should be any sudden drop or sudden increase in the speed of descent of the car or any part of the same, the bars *n'* will not follow this rapid descent. Hence the rail on the under side of the car will act upon the lever *p* so as to force the tooth p^3 of the same into teeth of the racks *n*, thus arresting any farther descent of the car, but not interfering with the continued rotation of the same.

The rollers s^2 press upon the rail *s*, and the roller *o* bears against the face of the column A, so as to steady the car both in its rotation and rise and fall.

A winding stairway around the central post or column F provides a means of access to or descent from the various platforms of the tower independently of the car.

The term "series of drums" as I employ it does not necessarily mean a series of drums turning on independent axes, the term "series" referring rather to the number of portions which receive the hoisting-ropes, since it will be evident that there may be a number of single drums corresponding to the number of hoisting-ropes, or a less number of composite drums, the number being capable of reduction to a single drum, if desired, as shown in Fig. 6. In this case the drum G' is centrally located and is secured directly to or forms part of the central sleeve *i*, the drum shown comprising a series of six smaller drums adapted for the reception of six hoisting-ropes, which is the whole number employed.

In raising the car the drum is prevented from rotating. Hence as the car-hanger rotates the hoisting-ropes are wrapped around the sections of the drum with the same effect as though the drum was being rotated and the car-hanger was stationary; and in order to lower the car the drum is permitted to turn, the weight of the car and its load causing it to turn faster than the car-hanger, so as to permit the ropes to unwind, the speed of rotation, and hence the speed of descent, being controlled by the brake on the friction-drum k^2.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of a tower having a central column or post projecting above the same, a rotating car hanger supported upon the projecting portion of said column or post, a se-

ries of drums, a series of hoisting ropes adapted to said drums, a car suspended from the rotating car hanger by said hoisting ropes, a sleeve connected to the hoisting drums and located concentric to the axis of rotation of the car hanger, and means whereby said sleeve can be prevented from rotating or can be permitted to rotate independently of the car hanger, substantially as specified.

2. The combination of a tower, a rotating car hanger surmounting the same, a series of drums, a series of hoisting ropes adapted to said drums, a car suspended from the rotating car hanger by said hoisting ropes, a central sleeve connected to said drums, a shaft having a friction drum thereon, and gearing whereby said shaft is connected to the sleeve.

3. The combination of a tower having a central column or post projecting above the same, a rotating car hanger supported upon the projecting portion of said central column or post, a series of drums mounted upon said car hanger around the central axis of the same, and each capable also of rotating around its own axis, a series of hoisting ropes wound upon said drums, a car suspended from the rotating car hanger by said hoisting ropes, a sleeve concentric with the axis of rotation of the car hanger, gearing whereby said sleeve is connected to each of the hoisting drums and means for locking said sleeve so as to prevent it from rotating or releasing it so as to permit it to rotate independently of the car hanger, substantially as specified.

4. The combination of the tower, the rotating car hanger above the same, winding drums, hoisting ropes adapted thereto, a car surrounding the tower and suspended from the rotating structure by said hoisting ropes, racks on the columns of the tower, and slides carrying levers with teeth for engaging said racks, said levers being adapted to be operated by the car on any sudden descent of the same.

5. The combination of the tower, the rotating car hanger surmounting the same, hoisting drums, hoisting ropes adapted thereto, the car surrounding the tower and suspended from the rotating car hanger by said hoisting ropes, racks on the columns of the tower, slides on said columns, an annular rail carried by said slides, and engaging with projections on the car, and levers carried by said slides and adapted to be operated by the car on the sudden descent of the same so as to cause teeth on the levers to engage with the racks.

6. The combination of the tower, the rotating car hanger surmounting the same, hoisting drums, hoisting ropes adapted thereto, the car surrounding the tower and suspended from the rotating car hanger by said hoisting ropes, racks on the columns of the tower, slides on said columns, levers carried by said slides, and having teeth for engaging the racks, and an annular rail on the car for acting upon said levers.

7. The combination of the tower, the rotating car hanger, the series of drums, the hoisting ropes, the suspended car surrounding the tower, slides on the columns of the tower, rollers carried by said slides and bearing on said columns, an annular rail carried by the slides, projections on the car engaging said rail, and antifriction rollers interposed between the inner side of the car and the outer side of the rail.

8. The combination of the tower, the rotating car hanger, the series of drums, the hoisting ropes, the suspended car surrounding the tower, racks on the columns of the tower, slides carrying devices for engaging said racks, devices for raising said slides with the car, and means for partially counterbalancing the weight of the slides and their attached parts, so as to cause a slow descent of the same.

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

ASTERIO GUERRA.

Witnesses:

FRANK E. BECHTOLD,

JOSEPH H. KLEIN.