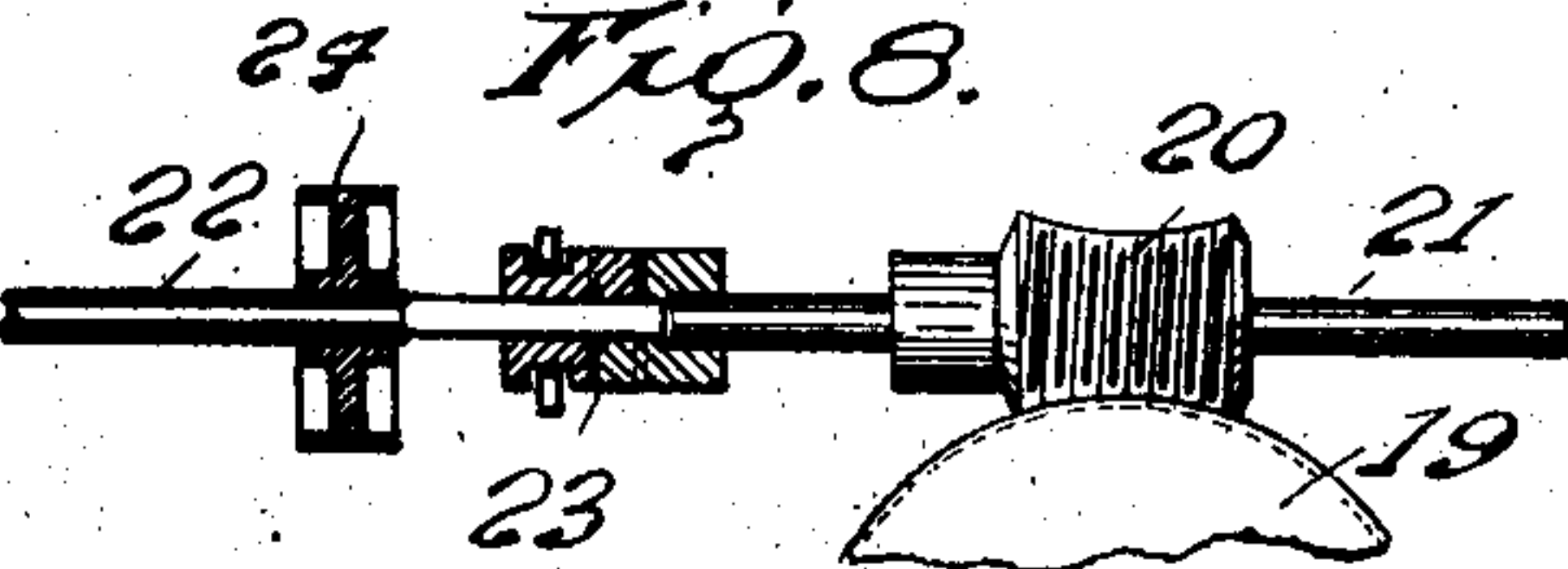
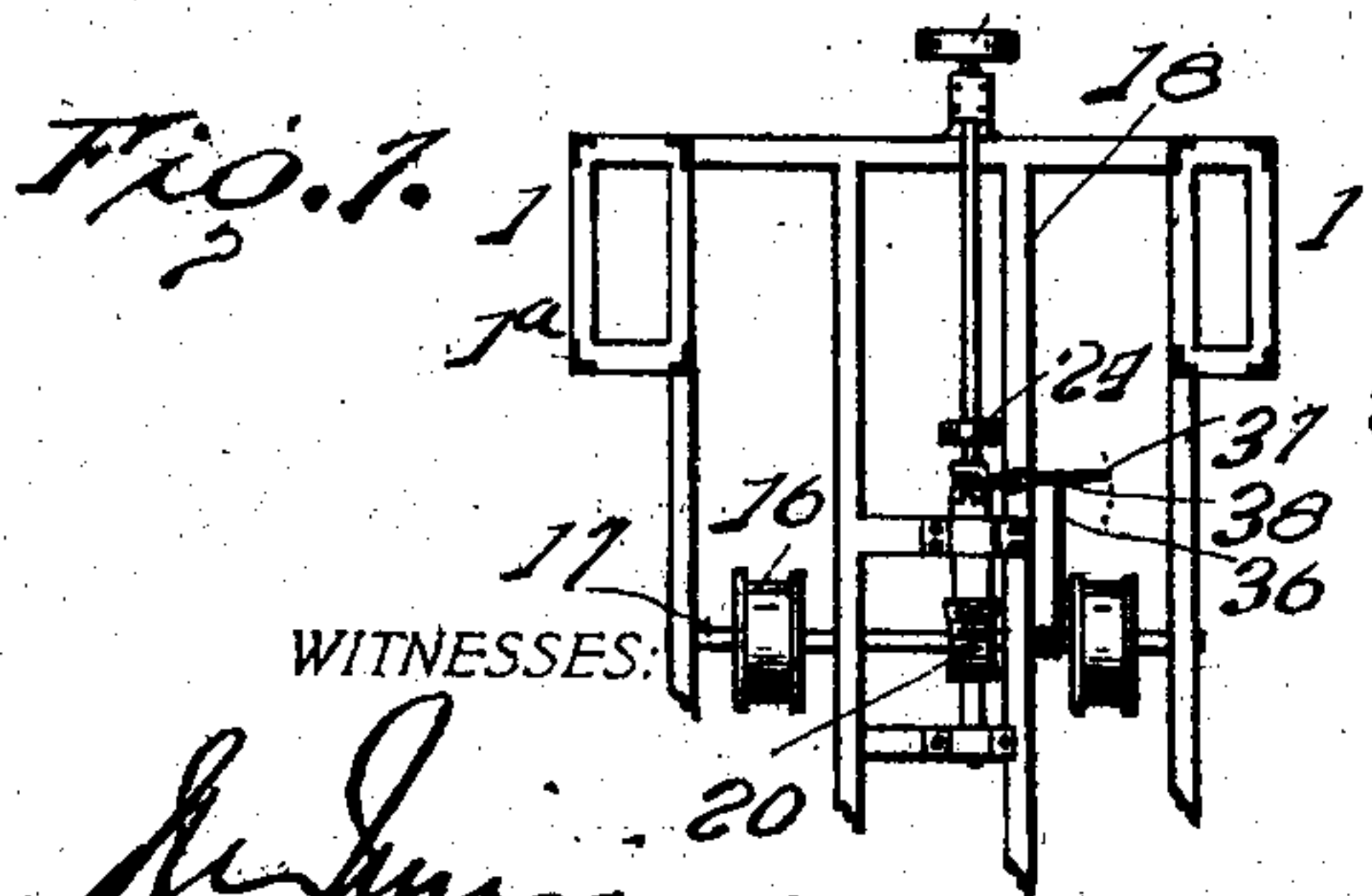
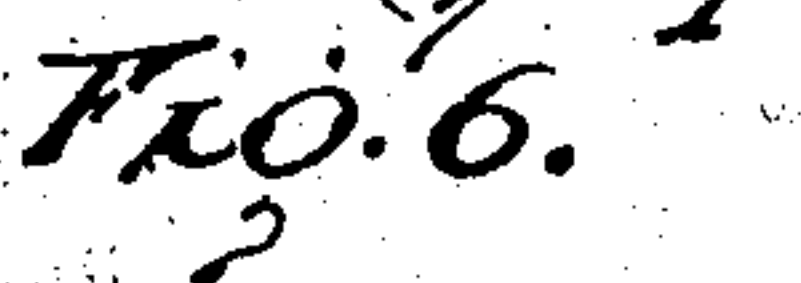
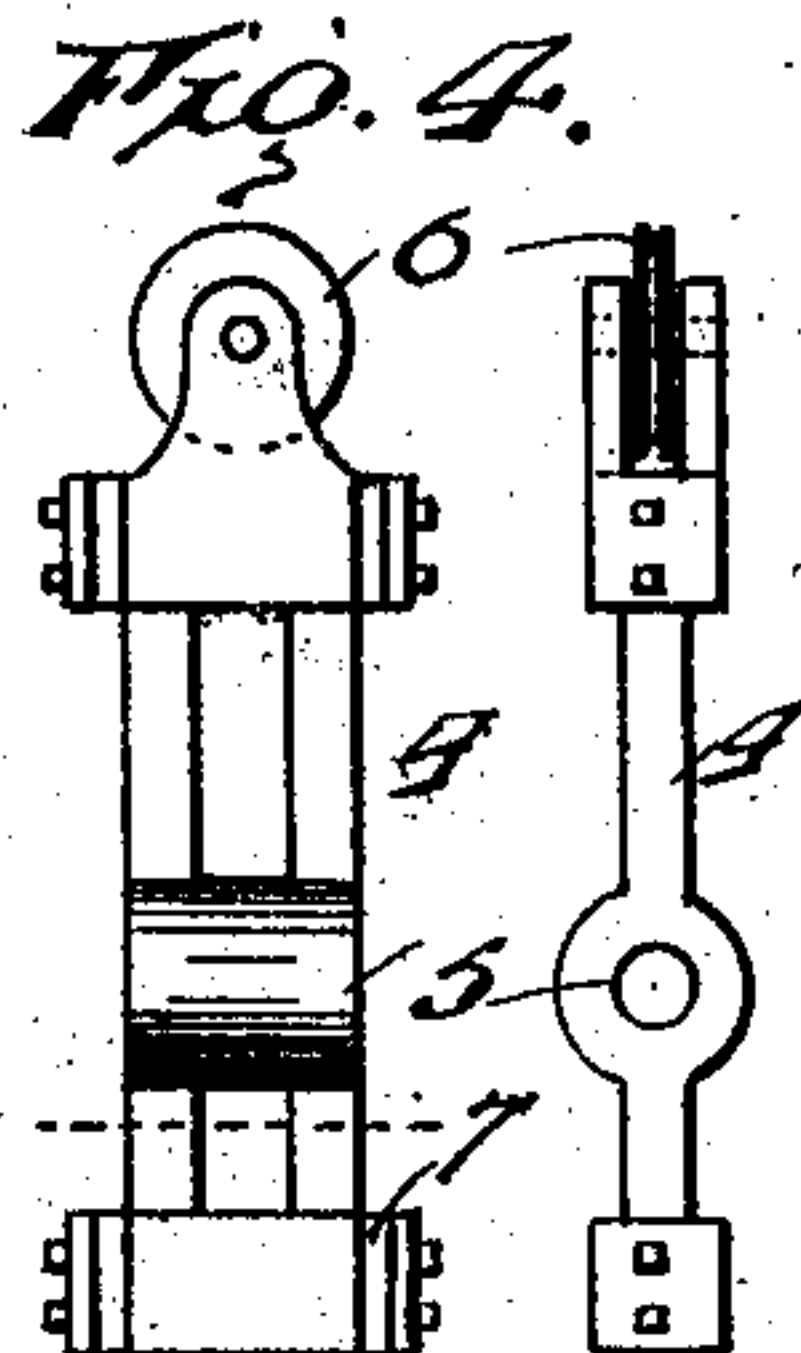
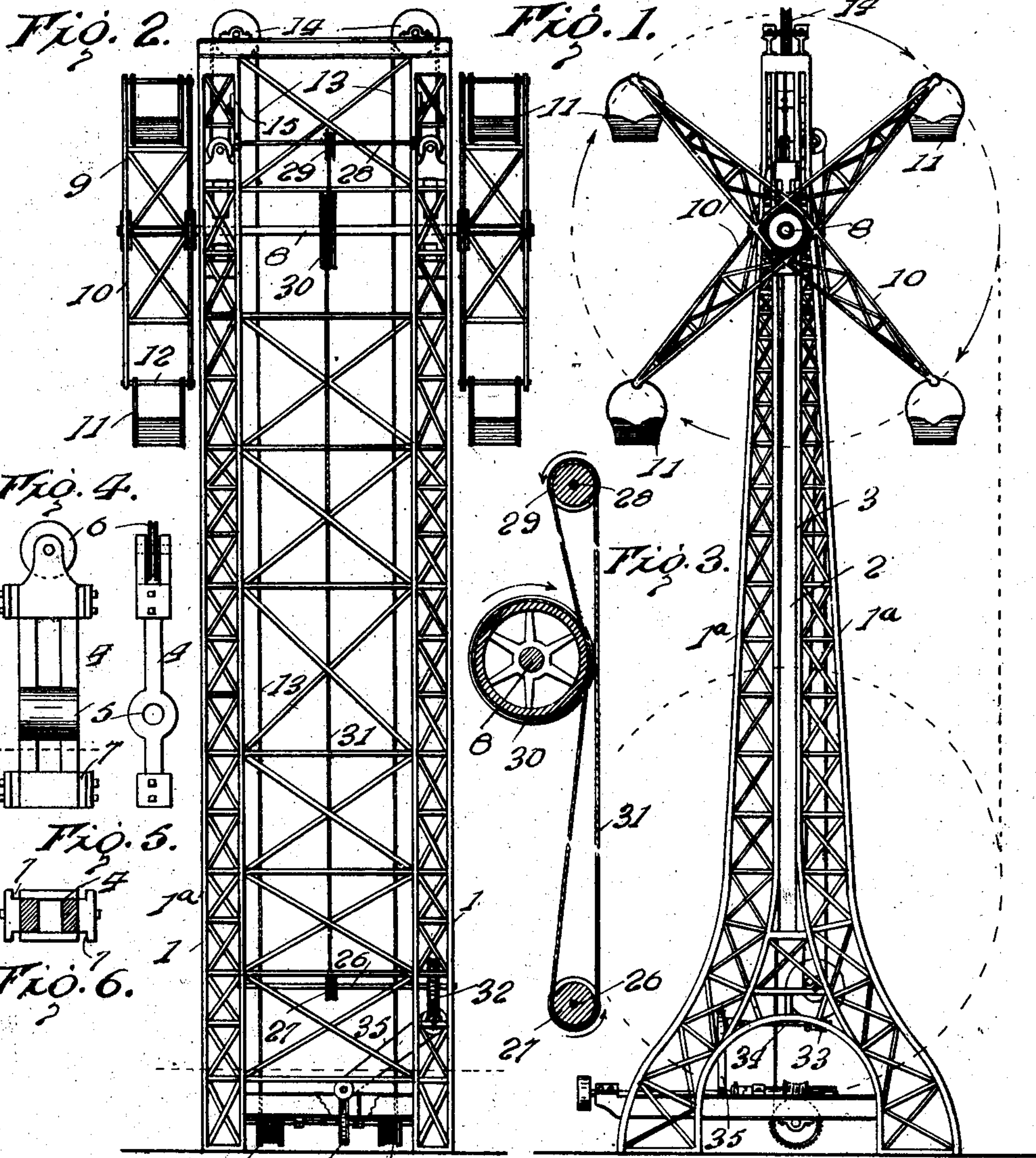


No. 827,214.

PATENTED JULY 31, 1906.

C. H. COOLEY.  
OBSERVATION TOWER.  
APPLICATION FILED APR. 18, 1906.

2 SHEETS—SHEET 1.



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No. 827,214.

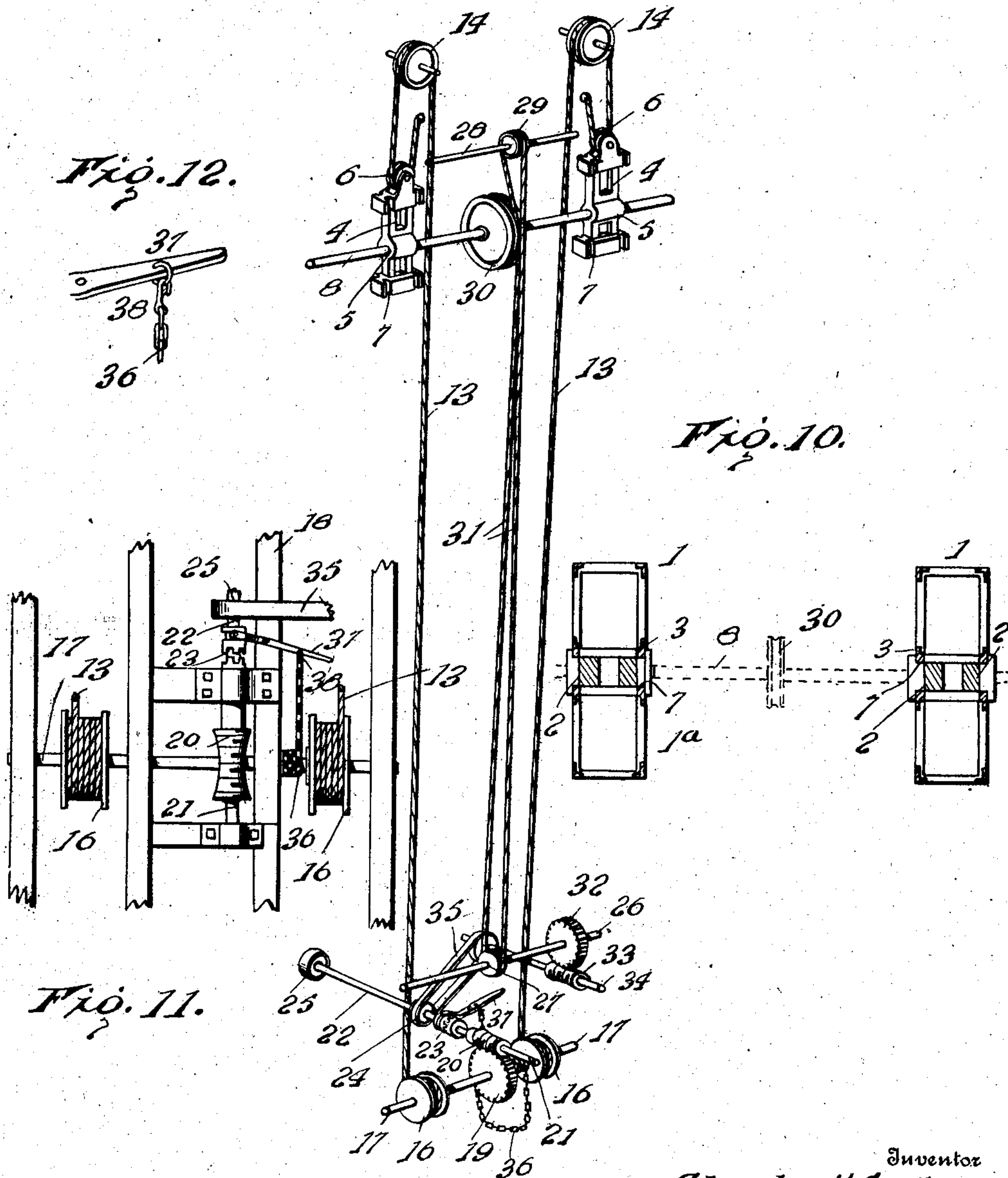
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2 SHEETS—SHEET 2.

Fig. 9.

Fig. 12.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## OBSERVATION-TOWER.

No. 827,214.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed April 18, 1906. Serial No. 312,436.

*To all whom it may concern:*

Be it known that I, CHARLES H. COOLEY, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Observation-Towers, of which the following is a specification.

My invention relates to amusement devices, and particularly to a novel construction of observation-tower in which a series of cars is mounted to revolve about an axis which may be raised and lowered and stopped at will while the cars are revolving.

The object of my invention is to provide an observation-tower of this character embodying an improved construction and arrangement of the parts, which are at all times under the control of one operator and in which are embodied safety devices designed to automatically prevent the revoluble series of cars from exceeding a predetermined altitude or from being lowered beyond the desired point.

With this and other objects in view, as will more fully appear as the description proceeds, the invention consists of the constructions, arrangements, and combinations of the parts hereinafter fully described and claimed.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings, in which—

Figures 1 and 2 are side elevations of my improved observation-tower, said views being taken at right angles to each other. Fig. 3 is a detail view illustrating the means for revolving the cage or revoluble series of cars, the actuating-cable therefor being broken away or foreshortened. Figs. 4, 5, and 6 are detail front, side, and horizontal sectional views, respectively, of one of the hangers from which the cage is suspended. Fig. 7 is a detail top plan view illustrating the hoisting-drums, worm-gear, and automatic safety-clutch, the tower structure being broken away or shown in horizontal section. Fig. 8 is a detail side elevation with parts in section and on a large scale of part of the actuating means for raising and lowering the cage or carriage. Fig. 9 is a perspective view illustrating the actuating-gear or movable elements apart from their supporting structure. Fig. 10 is a horizontal sectional-view through

the structural framework of the tower. Fig. 11 is a view, upon an enlarged scale, of some of the parts illustrated in Fig. 7, the clutch being actuated to uncouple the two sections of one of the shafts. Fig. 12 is a detail perspective view illustrating a portion of the hand-lever for the clutch and the means for detachably connecting the automatic operating-chain thereto.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The tower structure itself of my invention may be of any desired construction or design so long as it provides suitable guides for the cage-suspending hangers and suitable supports for the actuating means, and in the present instance such structure embodies a lattice or braced framework, preferably of structural iron or steel and comprising two vertical standards 1, each of which is formed in two spaced-apart members 1<sup>a</sup>, forming a vertical guideway 2 between them. The tracks of the guideway 2 are constituted by the adjacent vertical bars 3 of the spaced-apart members 1<sup>a</sup> of each standard or upright, and there is provided a hanger 4 for each guideway. Each hanger, as illustrated in Figs. 4, 5, and 6, comprises a body portion formed near its lower end with a shaft-bearing 5, at its upper end being provided with a sheave 6 and being formed at both upper and lower ends with two pairs of recessed guides 7, designed to receive the vertical bars 3 of the members 1<sup>a</sup>. By this means each hanger 4 is mounted to slide up and down in one of the guideways 2.

Within the opposite shaft-bearings 5 of the two hangers 4 is journaled the main carrying-shaft 8, extended beyond the framework at both ends and supporting in a revoluble manner two cages or carriages 9. These carriages may either be a solid wheel or, as shown in the present instance, may comprise a series of radial arms 10 of any desired number carrying at their outer ends freely-swinging cars 11 for the reception of passengers. The arms 10 are arranged in pairs spaced apart from each other, as shown in Fig. 2, and the cars 11 are suspended upon supporting-rods 12, secured between the outer ends of each pair of arms.

Hoisting-cables 13 are mounted to pass over pulleys 14, journaled in boxes at the up-



per end of the framework of the tower, and pass around the sheaves 6 and may be provided at their ends with counterbalancing-weights (not shown) or may be, as in the present instance, secured at one end in a permanent manner to plates or similar attaching means, as indicated at 15. The actuating-cables 13 pass downwardly and wind around hoisting-drums 16 on a counter-shaft 17, journaled in a base-frame 18 of the tower-framework. The counter-shaft 17 carries a gear-wheel 19, meshing with a worm 20 on a shaft 21. The shaft 21 is preferably constructed in two sections, of which one is designated 22, said sections being connected together whenever desired by means of a clutch 23. The section 22 carries a pulley 24. The shaft 21 is a driving-shaft for the apparatus, and for this purpose the outer end of this section 22 is provided with a pulley 25, designed to receive its motion in any desired manner and from any source of power.

Above the actuating means just described a transverse shaft 26 is mounted in the framework, and a grooved pulley 27 is secured thereon. Near the upper end of the framework is mounted another transverse shaft 28, also provided with a grooved pulley, designated 29. The main supporting-shaft 8, on which the revoluble series of cars 11 are mounted, has secured on it a grooved band-wheel 30, preferably of larger diameter than the grooved pulleys 27 and 29 and interposed between the same and in alinement therewith. An endless cable 31 extends around both the pulleys 27 and 29 and is looped with one or more turns about the band-wheel 30, as best indicated in Fig. 3. The shaft 26 is provided at one end with a gear-wheel 32, meshing with a worm 33 on a shaft 34. The shaft 34 is connected by a pulley and belt 35 to the pulley 24 and the section 22 of the shaft 21.

From the foregoing description, in connection with the accompanying drawings, it will be seen that as the shaft 21 is rotated, it being understood that the clutch 23 has been actuated to connect the two sections of the shaft together, the said shaft 21 will turn the hoisting-drums 16 in one direction or the other, so as to elevate or depress the hangers 4 and the shaft 8 carried thereby, the two series of revoluble cars 11 by this means being raised or lowered bodily. At the same time it is to be noted that the shaft 26 is receiving a rotary movement through the instrumentality of the pulley 24, belt 35, and worm-gearing before described, and as the shaft 26 turns it is manifest that the traverse of the endless cable 31 will impart a rotary movement to the band-wheel 30 and revolve the two series of cars 11 as they are being raised and lowered. If it be desired to stop the ascent or descent of the cars and continue their revolution at any desired elevation, this may

be readily accomplished by actuating the clutch 23 to uncouple the two sections of the shaft 21. This action, it will be seen, will result in the continued revolution of the section 22 of the shaft and the consequent revolution of the series of cars 11, while at the same time that section of the shaft 21 carrying the worm 20 will remain motionless and no motion will be imparted to the shaft 17 nor through said shaft to the suspending hangers 4. By employing worm-gearing, as before described, the cars may be thus held at any elevation without danger of descending by their own weight when released, as just described.

In order to prevent the series of cars from ascending bodily beyond a certain extreme height, I have provided safety means for automatically throwing the elevating and lowering section of the shaft 21 out of action. This means comprises, in the present instance, a chain or similar flexible member 36, designed to wind up upon the shaft 17, as illustrated in Fig. 7, and connected at one end to the actuating-lever 37 for the clutch 23. Preferably the flexible member 36 is attached to the lever 37 by some detachable connection—as, for instance, a hook and ring 38. As the shaft 17 rotates to effect the elevation of the series of cars the chain or flexible member 36 will wind up upon the shaft 17 and as soon as it becomes taut will draw upon the lever 37 and automatically effect the uncoupling of the two sections of the shaft 21, which, as is manifest, will throw the elevating and lowering section of said shaft out of gear. It is obvious that this action may be effected also as the shaft 8 is being lowered, this movement being accompanied merely by the change of direction of the shaft 17. The chain 36 may be so proportioned as to automatically stop the elevation or lowering of the shaft 8 and the cars carried thereby at any desired point, and it will be seen that it constitutes an effective safety mechanism. In order to throw that section of the shaft 21 back again into gear after the safety mechanism has acted, the before-mentioned detachable connection 38 is provided, so that the operator may unhook the chain from the lever 37 and manipulate the latter to reverse the movement of the clutch. After the clutch has coupled the two sections of the shaft together the safety mechanism may be at once brought into operative relation to the other parts by again hooking the chain to the lever 37 after one or two revolutions of the shaft 17.

It is obvious that the independent arrangement by which the cars 11 may be revolved without effecting a raising and lowering movement of the same bodily may be taken advantage of with the cars at the lower limit of their movement, so as to bring one car after the other to a platform at the base of



the structure, from which the passengers may step into the car, the main driving-shaft 21 being intermittently stopped until the cars shall have been occupied.

5 Having thus described the invention, what is claimed as new is—

1. In an observation-tower, the combination of the tower proper, a revoluble carriage mounted to move up and down on said tower, 10 means for revolving said carriage, means for raising and lowering said carriage at the same time it is being revolved, a clutch designed to connect the revolving mechanism with the raising and lowering mechanism, 15 and a detachable connection between a portion of the raising and lowering mechanism and the actuating part of said clutch, said connection being arranged to automatically actuate the clutch at a certain point in the 20 elevation of the carriage, in such a manner as to disconnect the revolving mechanism from the raising and lowering mechanism.

2. In an observation-tower, the combination of the tower proper, a revoluble carriage 25 mounted to move up and down on said tower, a hoisting-shaft designed to effect the raising and lowering of the carriage, mechanism for revolving the carriage as it is being raised and lowered, and a driving-shaft operatively 30 connected to said last-named mechanism and having a clutch connection with the hoisting-shaft, whereby the hoisting-shaft may be disconnected from the driving-shaft and the hoisting and lowering mechanism thrown 35 out of gear without affecting the revolution of the carriage.

3. In an observation-tower, the combination of the tower proper, a revoluble carriage 40 mounted to move up and down on said tower, means for moving said tower up and down, a revoluble shaft embodied in said carriage and provided with a band-wheel, an endless cable looped around said band-wheel and designed to extend both above and below said 45 shaft, and means for effecting a traverse of said cable whereby to revolve the carriage.

4. An observation-tower, comprising a tower structure provided with vertical guideways, hangers mounted to move in said

guideways, hoisting-cables operatively connected to said hangers to raise and lower the 50 same, a transverse shaft journaled in said hangers, a revoluble series of cars carried on said shaft, a band-wheel mounted on said shaft, upper and lower transverse shafts 55 mounted in the framework and each provided with a pulley, an endless cable extending around said pulleys and looped around said band-wheel, means for effecting the traverse of said cable, and hoisting mechanism 60 for the hoisting-cable.

5. An observation-tower comprising a tower structure, a revoluble carriage mounted to move up and down on said structure, a hoisting-shaft mounted in the lower end of 65 said structure and provided with hoisting-drums, hoisting-cables operatively connected to the revoluble carriage and designed to wind around said drums, a worm-shaft operatively connected to the hoisting-shaft and 70 constructed in two clutch-connected sections, means for driving one of said sections, means for revolving the carriage, an operative connection between said revolving means and 75 the driven section of the worm-shaft, a lever designed to manually operate the clutch, and a flexible member connected to said lever and designed to wind around the hoisting-shaft, as and for the purpose set forth.

6. In an observation-tower, the combination of a tower structure, a revoluble carriage 80 mounted to move up and down on said tower structure, means including a hoisting-shaft for raising and lowering the carriage, means for revolving the carriage, a clutch designed 85 to couple and uncouple the revolving mechanism to and from the hoisting mechanism and including a lever, and a flexible member designed to wind around the hoisting-shaft and having a detachable connection with the 90 clutch-lever, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. COOLEY. [L. S.]

Witnesses:

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