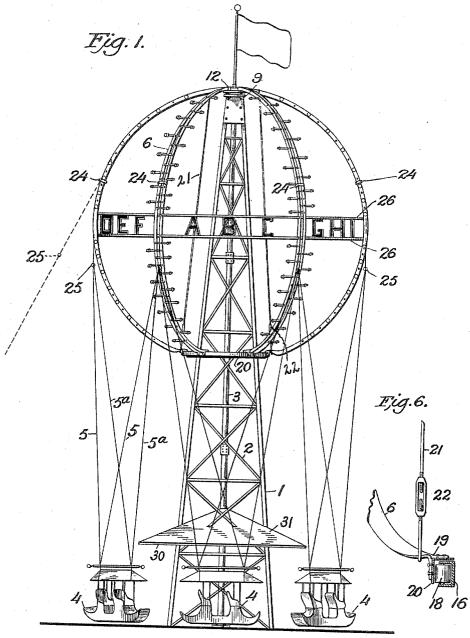
No. 821,409.

PATENTED MAY 22, 1906.

T. A. & T. H. FULTON. AMUSEMENT APPARATUS. APPLICATION FILED FEB. 4, 1906.

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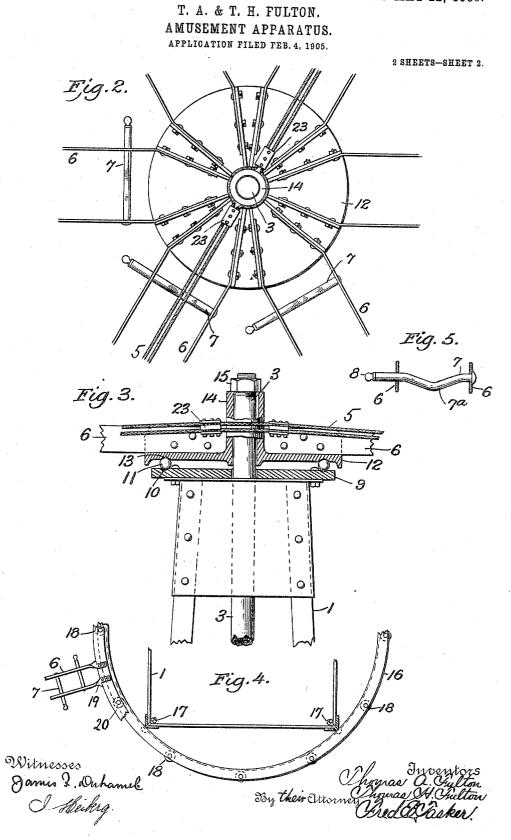


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UNITED STATES PATENT OFFICE.

THOMAS A. FULTON AND THOMAS H. FULTON, OF NEW YORK, N. Y.

AMUSEMENT APPARATUS.

No. 821,409.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed February 4, 1905. Serial No. 244,119.

To all whom it may concern:

Be it known that we, THOMAS A. FULTON and THOMAS H. FULTON, citizens of the United States of America, and residents of the borough of Richmond, in the city of New York, county of Richmond, and State of New York, have invented certain new and useful Improvements in Amusement Appa-

ratus, of which the following is a specificato tion. Our invention has to do with amusement

apparatus of the general class termed ''roundabouts,'' and has for its object the improvement in the combination and arrangement 15 whereby simplicity of construction is achieved

and ease of operation, coupled with strength and durability, promoted and assured.

The invention consists in the construction and combination of the various mechanical 20 features, substantially in the manner hereinafter described, and then particularly pointed out in the appended claims.

In the accompanying drawings, illustrating our invention, Figure 1 is a front elevation of

- 25 our improved amusement apparatus. Fig. 2 is a top partial plan view on a large scale. Fig. 3 is a vertical section showing the upper bearing on which the spherical frame is supported. Fig. 4 is a detail view of a portion of the lower bearing frame and a plan is a portion of the lower
- 30 bearing for said spherical frame. Fig. 5 is a detail sectional view of one of the pins connecting rib-sections. Fig. 6 represents details of the lower bearing for the spherical frame and indicates one of the braces for giv-35 ing rigidity to said frame.

Similar numerals of reference designate corresponding parts throughout the different figures of the drawings.

- 1 indicates a tower. It is an upright frame
 40 of steel or other metal of suitable height and properly braced by cross-braces 2, said tower tapering usually from bottom to top. Supported revolubly in suitable bearings in the tower is a vertical shaft 3, which is rotated
 45 by means of some suitable electric or other
- 45 by means of some suitable electric or other motor properly geared thereto and not shown in the drawings, as we lay no claim to the motor, the application of such a driving means to a driving-shaft being common.
- 50 4 designates the cars or carriages, of which there may be any number, adapted to contain pleasure-seekers who ride therein in order to enjoy the sensation of pleasure and exhilaration incident to a rapid movement through
- 55 the air. These cars may have any preferred | ner in which the ribs 6 are bolted or otherdesign and shape, and they are supported by | wise secured thereto. Thus it will be seen

means of the cables 5 and 5^{a} , the cables 5 running to one end of the car and the cables 5^{a} to the other end, while the members of each pair of cables 5 5^{a} run together and 60 alongside each other up to the top of the apparatus, as shown in Fig. 1.

The car-supporting cables are carried by a globular or spherical skeleton frame, which is hung revolubly on the tower 1 near the top, 65 there being preferably two bearings or forms of support at the two poles of the sphere. This spherical frame consists, essentially, of semicircular ribs arranged in pairs, said ribs being designated by the reference-numeral 6. 70 One convenient construction is to make the sphere or globe consist of six pairs of these The members of each pair are located ribs 6. a short distance apart and are rigidly con-nected together by means of the pins 7, which 75 pass through the ribs, said pins projecting alternately in different directions and being provided on the said projecting ends with insulating means, as 8, whereby lamps may be supported for the purpose of illuminating the 80 apparatus at night and causing a brilliant elec-trical effect. There may be any number of these cross-pins 7 and they may be either straight or bent, as shown at 7^a in Fig. 5, the object of thus bending the pin 7 being to pro- 85 vide an indented channel between the ribs 6 to receive more securely the car-supporting cables $5 5^{a}$, which extend upwardly between the ribs 6 and lie on the pins 7 and are fastened at the top of the apparatus around the 90 upper part of the shaft 3, all as clearly indicated in Fig. 3.

The top of the tower 1 is provided with a horizontal metallic plate or casting 9, which obviously is stationary and rigid. The top 95 surface of plate 9 is furnished with a circular groove 10, in which is a series of balls 11, and above plate 9 is another plate 12, having therein a circular groove 13, which also receives the balls 11, so that in this way a 100 ball-bearing is provided between the stationary top of the tower and the revolving plate 12. This plate 12 is the top pole-plate of the spherical frame, and it has a boss or hub 14 thereon, through which passes rotary shaft 3, 105 which is keyed thereto, the upper end of said shaft having preferably thereon a nut 15, as shown in Fig. 3, which screws tight on hub 14. The exact form of the polar plate 12 may vary within wide limits, as also the manner in which the ribs 6 are bolted or otherwise secured thereto. Thus it will be seen

that the weight of the spherical frame, and of the cars supported by said frame, bears chiefly on the top of the tower, where the above-described ball-bearing is introduced 5 for the purpose of diminishing friction and affording ease of movement. At the bottom pole of the sphere or ball a horizontal ring 16, of channel-iron, encircles tower 1 and is secured thereto by means of suitable bolts 17 10 or otherwise, said ring 16 being shown partly in plan in Fig. 4 and in section in Fig. 6. As the ring 16 is of channel-iron, one side is open, as seen in Fig. 6. In this channeled ring are journaled at intervals vertical rollers 18 of 15 some suitable antifriction variety, the surfaces of the rollers projecting outside of the channeled ring, in which they are journaled. These rollers constitute a part of an antifriction-bearing for the lower portion of the ball 20 or spherical frame, the revolving member of which bearing is connected with such frame and preferably consists of a ring-shaped member or wearing-shoe 20, secured to the lower ends 19 of the ribs 6, as indicated in 25 Fig. 6. This shoe 20 surrounds the tower 1 and has a smooth vertically-disposed surface that engages with the antifriction-rollers 18, thereby permitting the frame to revolve smoothly and swiftly. It will also be seen 30 that the shoe 20, being connected to all the ribs 6, operates to impart strength and rigidity to the spherical frame, for which purpose it is preferably of the angular shape in crosssection represented in Fig. 6. In order to 35 further strengthen the spherical frame or ball, we employ stay-rods 21, fastened to the ribs 6 near the top pole-plate 12, (see Fig. 1,) and also fastened to the lower ends of the ribs 6

- by hooking or otherwise near the angular 40 lower ends 19, said stay-rods 21 being made in two or more pieces and provided with turnbuckles 22 in order that they may be taut, and thereby caused to impart stiffness and strength to the sphere.
- 45 Of course one of the principal objects of the globe, ball, or spherical frame is to secure greater stiffness or stability in the structure, and especially in that portion of the structure from which the cars are suspended. The
 50 globular form is admirably adapted to fulfil this purpose, and by the use of the top polar plate and hub resting upon ball or roller bearings the weight is placed upon the top of the tower where it ought to be.

55 The car-supporting cables 5 5^a pass upward into the channels between the ribs, as above explained, until they reach the top hub of the frame, where they are fastened together by means of clamps 23, located at
60 both sides of the hub 14, and the cables are separated from each other, so as to pass around the hub 14, as shown in Fig. 2. Thus the cables lead upward from a car on one side of the machine to a point where they are
65 thus connected to the spherical frame, and

then the same cables lead down on the other side of the machine to another car. In this way all shackles, pins, and joints, as well as the splicing of cables, are avoided and danger of breakage reduced to a minimum.

As the spherical frame revolves the carsupporting cables will move out centrifugally from the position shown in full lines in Fig. 1 to the position shown in dotted lines in the same figure, and when they are in the latter 75 position they will be considerably more out of the channel between the ribs than when they are in the former position. There is little danger of their flying out so far as to entirely leave the guiding-channels between 80 the ribs; but in order to effectually guard against their ever doing so the pairs of ribs are provided with one or more clips or connections 24, against which the cables will strike when the centrifugal movement pro- 85 ceeds far enough. All the cables which enter one channel between the parallel ribs may be grouped together, if desired, or united by some fastening device at 25. It is to be noted, moreover, that the pins or bolts 7 90 serve not only to connect the ribs 6, but also serve as the rungs of a ladder running from top to bottom of the globular or spherical frame, on which ladder the workmen can ascend and descend, working with safety 95 on repairs or when adjusting the electric wires for illuminating purposes. Around the equatorial portion of the spherical frame or at some other point thereon we preferably apply a light construction consisting of a 100 couple of parallel horizontal rods 26 or consisting of lattice-work, the same fastened to the ribs 6 and forming an admirable displayplace upon which to carry an illuminated sign or lettering to designate the character 105 of the amusement apparatus and to attract patrons, the exact construction of this frame being variable within wide limits.

An amusement apparatus of the character we have just described is absolutely safe in 110 its operation, inasmuch as the cars are suspended at such a point from the tower and are so revolved that there is no liability of striking the tower or of having any improper lateral swing, and hence there can be no 115 sudden stop through a lashing of the cars against the tower; neither is there any danger arising from a weakness in the support of the cars, as they are held by the strong rib and spherical construction, which is the 120 strongest construction known and which suspends the cars and moves them in an absolute secure and easy way. The danger which exists in machinery of this character of having the cars strike against the tower 125 may be obviated by the use of a circular guard-rail, as 30, which may be built out from or attached to the tower in some suitable way—as, for instance, by means of arms 31, which arms may be joined together to 130 form a roof. The cables that support the cars strike against this rail when any influence causes them to swing too far inward, and thus the cars are prevented from striking the tower. When a roof supports the guardrail, it serves to protect the machinery and may itself constitute a fender or guard with-

out the latter being a separate device. Having thus described our invention, what 10 we claim as new, and desire to secure by Let-

ters Patent, is— 1. The combination with a tower, of a frame having a bearing at the top thereof,

said frame comprising ribs arranged in pairs, 15 a top hub to which the ribs are connected, cables connected to the hub from which the cars are hung, and means for supporting the cables between the ribs of each pair, substantially as set forth.

20 2. The combination with a tower, of a spherical or globular frame having a bearing at the top of the tower and consisting essentially of ribs arranged in pairs, the members of the pairs being connected together to form

- 25 guide-channels, and cars together with supporting-cables for the cars, which cables pass upward in the channels between the ribs and are connected to the upper part of the globular frame.
- 30 3. The combination with a tower, of a globular frame having a bearing at the top thereof, said frame consisting essentially of ribs, a top hub to which they are connected, and a ring for connecting the lower ends of
- 35 them together, antifriction means carried by the tower for facilitating the rotation of the lower part of the globular frame.

4. The combination with a tower, of a

skeleton globular frame, consisting essentially of ribs arranged in pairs, pins connect- 40 ing the members of each pair, a top hub to which the ribs are connected, a ball-bearing at the top of the tower, a series of rollers carried by the tower for facilitating the revolution of the lower portion of the globular 45 frame and cars with their supporting-cables suspended from said frame.

5. The combination with a tower, cars, a frame overhanging the cars and supported on the tower, and cables running from the 50 cars to the frame, of means for ttaching the cables to the frame for limiting the outward swinging movement of the cars.

6. The combination with a tower, of a globular frame having ribs arranged in pairs, 55 pins connecting said ribs, cars for carrying passengers and cables attached to the cars and lying between the ribs and in contact with the pins.

7. The combination with a tower, of a 6c spherical frame having its bearing at the top of the tower, said frame being composed essentially of pairs of ribs, a series of pins connecting said ribs and bent inward at their middle portions between the ribs to 65 form a groove, cars, and cables arranged to lie in said grooves for supporting the cars, substantially as set forth.

substantially as set forth. Signed at New York city this 31st day of January, 1905.

> THOMAS A. FULTON. THOMAS H. FULTON.

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Witnesses:

JOHN H. HAZELTON, I. HEIBERG. 8