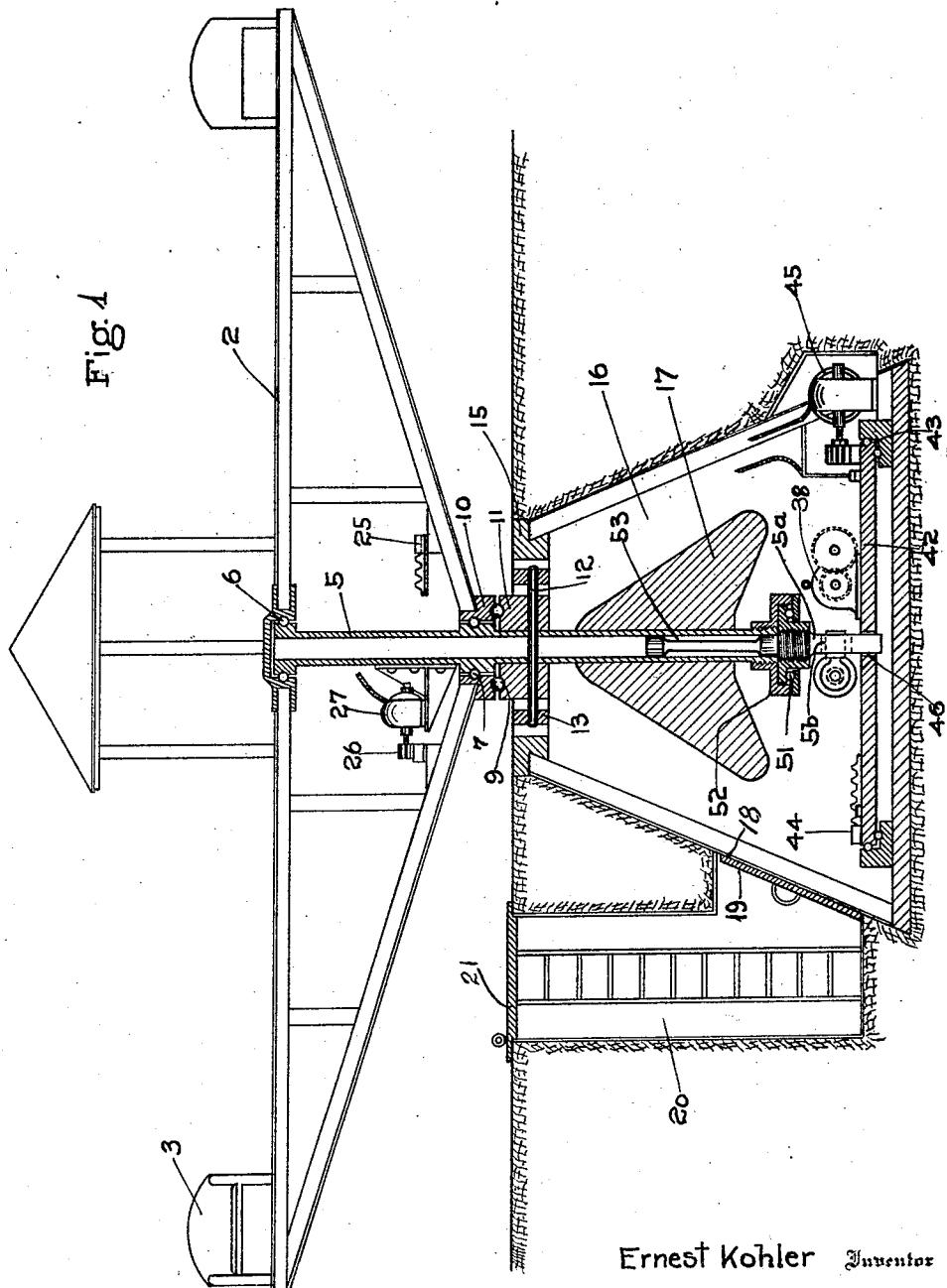


E. KOHLER.
GYRATORY ROUNDABOUT.
APPLICATION FILED AUG. 28, 1919.

1,421,013.

Patented June 27, 1922.

4 SHEETS—SHEET 1.



By *George F. Knickelbein*,
Attorneys

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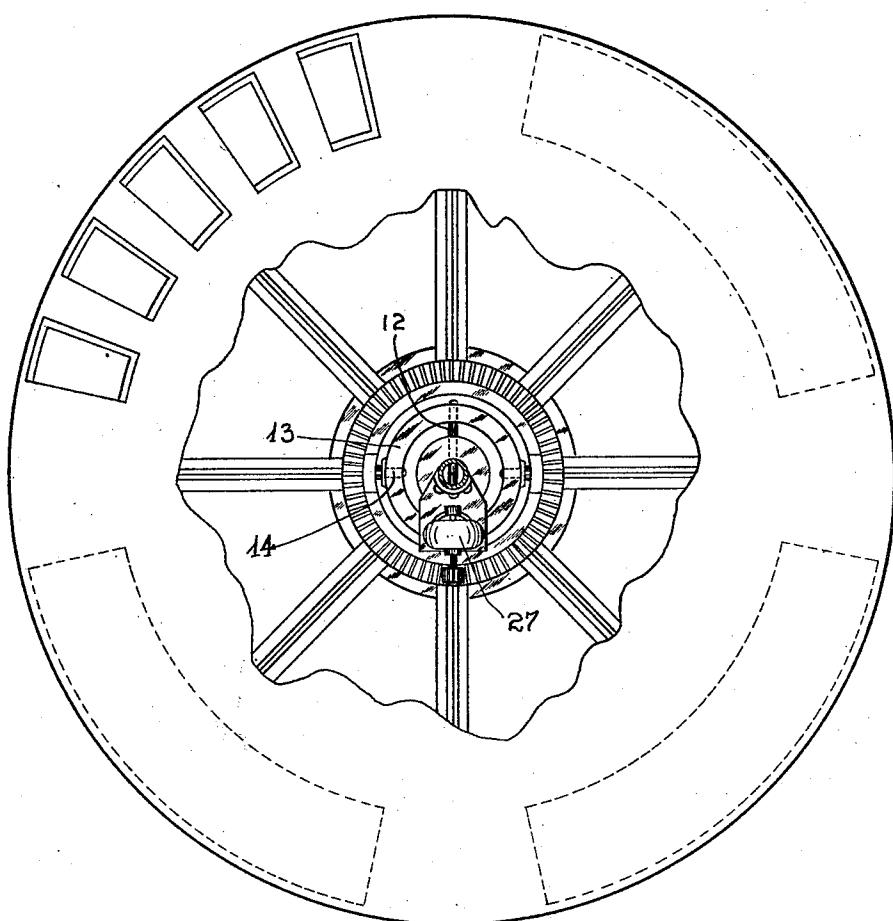
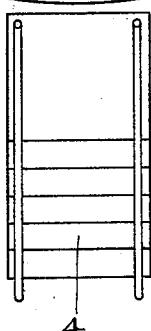


Fig. 2.



Ernest Kohler Inventor

By *Mason Tomick Lawrence*,
Attorneys

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4 SHEETS—SHEET 3.

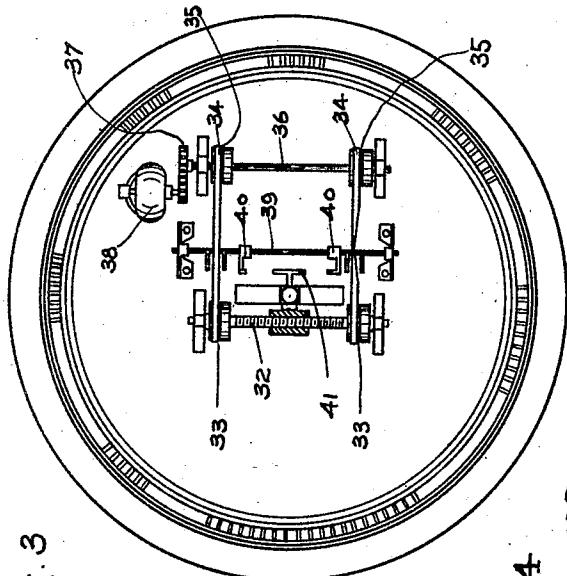


Fig. 3

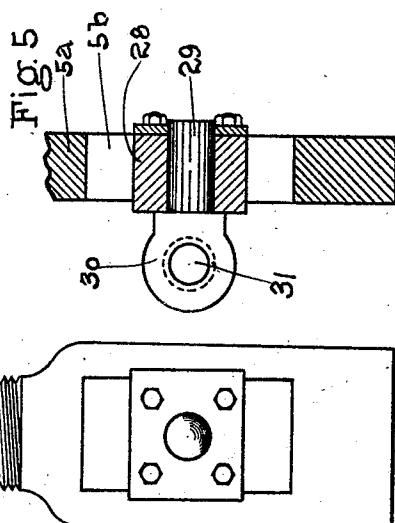


Fig. 4

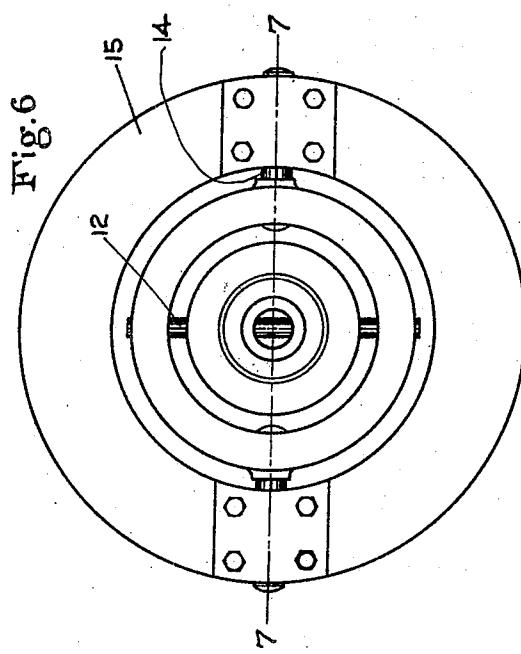


Fig. 6

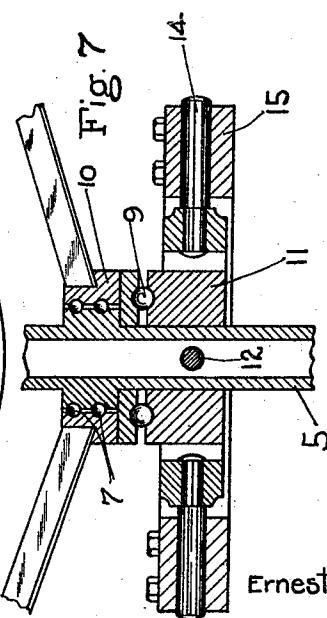


Fig. 7

Ernest Kohler
Inventor

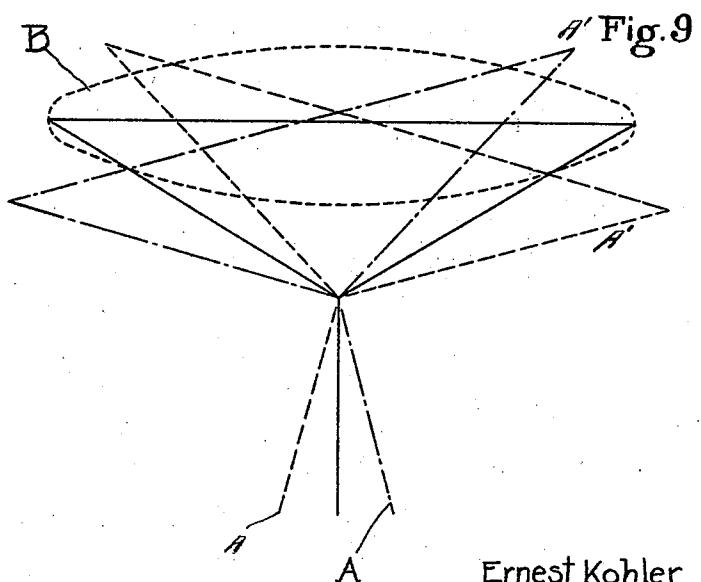
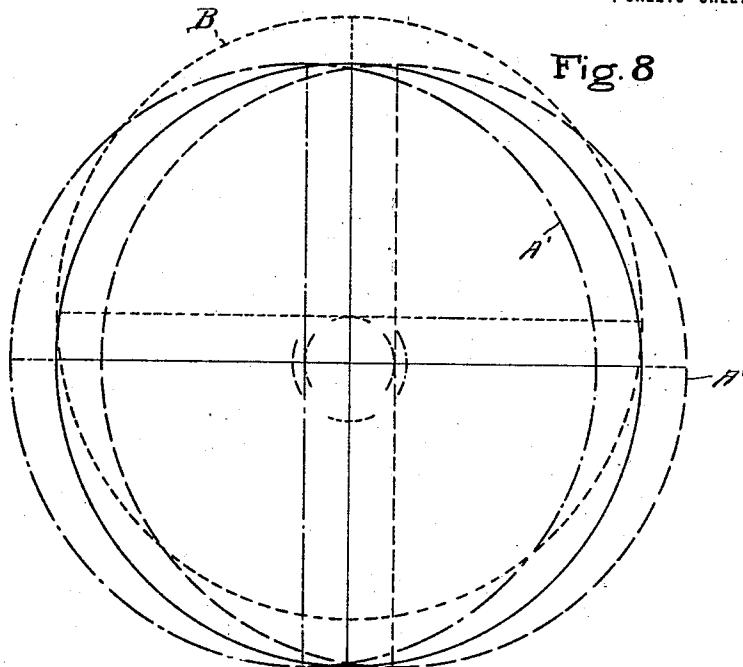
By *Jason Fenwick Lawrence*,
Attorneys

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E. KOHLER,
GYRATORY ROUNDABOUT,
APPLICATION FILED AUG. 28, 1919.

Patented June 27, 1922.

4 SHEETS—SHEET 4.



Ernest Kohler Inventor

By *Nason, Fenwick & Lawrence*
Attorneys

UNITED STATES PATENT OFFICE.

ERNEST KOHLER, OF DENVER, COLORADO, ASSIGNOR TO THE UNITED MINES AND MANUFACTURING COMPANY, A CORPORATION OF ARIZONA.

GYRATORY ROUNDABOUT.

1,421,013.

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To all whom it may concern:

Be it known that I, ERNEST KOHLER, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Gyratory Roundabouts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to amusement apparatus, and particularly to a form of amusement device in which is provided a carrier of suitable form of construction and shape, which is provided with passenger-accommodating means, such as seats, the carrier having a generally circular movement.

It is one of the objects of the present invention to provide an improvement in apparatus of the amusement character in which passenger-carrying means are subjected, to a gyratory motion, the amplitude of which may be varied as well as the velocity of the components of the gyratory motion. By a gyratory motion I mean in this instance a movement of a whirling body about an axis describing in its movements the surface of a cone or conoidal volute; and by variation of amplitude of gyration I mean a variation in the angle of the cone described by the axis of the whirling body or a continuous variation thereof as in describing a volute. A further object of the present invention is to provide an apparatus of this kind in which a plurality of relatively movable supports for carrying means are organized, so that the several movements may be used individually and independently of one another, or may be used collectively in the production of a peculiar path of movement through which the passengers are caused to travel while the device is in operation. A further object of the invention is to provide an apparatus of this kind which is safe, is economical in cost of operation, can be manipulated with the requirement of only a few personal attendants, and in which the parts are readily accessible for such purposes as may be necessary.

With the above and other objects in view, as will be rendered manifest to those versed in the art, the invention consists in the con-

struction, the combination, and in details and arrangements of the parts as more particularly described in the following specification relative to the embodiment of the invention illustrated in the accompanying drawings, in which:

Fig. 1 is a central, vertical, sectional view of the apparatus in one installation, certain of the parts being in elevation.

Fig. 2 is a plan view of an apparatus partly broken away to illustrate details of construction.

Fig. 3 is a plan view of the turn-table with a gear or drive mechanism arranged and carried thereon.

Fig. 4 is a side elevation of the lower portion of the carrier shaft.

Fig. 5 is a central, vertical section through Fig. 4, and showing in detail the cross-head.

Fig. 6 is a plan view of the gimbal bearing of the carrier.

Fig. 7 is a central, vertical section on line 7—7 of Fig. 6.

Fig. 8 is a diagrammatic view representing in plan the component paths of movement of the carrier.

Fig. 9 is a diagrammatic view of the paths of movement in a vertical plane.

In the illustrated embodiment of my invention, I have shown what is herein termed the carrier generally designated at 2, which is in the form of a frame-work of any suitable type of construction, and of any suitable plan and elevational contour, as, for instance, in plan being a plane circular table having on its upper surface seats 3, which may be arranged in any suitable grouping or order; access being provided to the table of the carrier 2 when the latter is in the normal, horizontal position shown in Fig. 1, as by means of a stairway or other suitable landing. The carrier structure is mounted on a column or upright post 5, the upper end of which is provided with anti-friction bearings 6, other bearings 7 being provided enabling the free rotation of the carrier 2 about the post 5. A further anti-friction bearing 9 is provided between upper and lower rings 10 and 11 on which the weight of the carrier 2 is principally carried. The lower or supporting ring 11 is part of a universally tiltable support which is provided with pivotal means en-

abling it to oscillate on a horizontal axis shown as comprising a pin or rod 12 extending into an intermediate or surrounding floating ring 13, which has at points 90° 5 from the axis of the rod 12, respective pivot-bearing or trunnions 14, which are mounted in an annulus or bearing member 15, this organization therefore forming what is generally called a gimbal ring providing substantially universal tilting in vertical directions of the post 5.

In the present instance the main bearing ring 15 is shown as forming the cap of a pit 16 down into which the post 5 projects 15 through the gimbal bearing, and on the lower portion of the post there is mounted a weight or counter-balancing device 17, which is thus mounted and moves in the pit 16. Access to this pit may be had 20 through a doorway 18 which is provided with a door 19, and the doorway is arranged at the foot of the shaft 20 which may have a cover closure 21. Obviously, instead of the apparatus being installed with part of 25 its mechanism in a pit, the lower mechanism may be arranged in any suitable housing, or even may be entirely exposed, but it is preferable that only the carrier 2 be disposed above the level of the floor or surface at 30 which the organization may be arranged, this not only making it more convenient for access by passengers, but also eliminating the extraneous structures that would be required with the entire organization arranged above the ground or floor level. 35

By mounting the carrier 2 for rotation about the post or column 5, it will be seen that the passengers can be caused to travel in a circular path or orbit while seated in 40 the chairs or seats 3, and to secure this rotation of the carrier 2 about the post 5 an annular rack 25 is suitably secured in the structure of the carrier 2, here shown as being arranged below the floor of the 45 carrier and as engaging a pinion 26 on the shaft of a motor 27 which is mounted on the post 5, and which may be of any suitable type.

Below the counter-weight 17, the lower 50 end of the shaft or column 5 is provided with an extension or foot part 5^a, which is longitudinally slotted, as at 5^b, to receive a cross-head 28 in the form of a rectangular block pivoted on a wrist pin 29, which in 55 turn extends from a slide 30, Fig. 5. This slide has a threaded bore 31 to take the threads of a worm shaft or screw 32, Fig. 3, the rotation of which causes the slide 30 to traverse back and forth on the length of 60 the screw 32 when the latter is rotated alternately in opposite directions, the result of this movement of the slide being to cause the post 5 to tilt to and fro on its gimbal bearing 12—14. To secure the intermittent 65 and reverse rotation of the shaft 32, it is

provided with pairs of tight and loose pulleys 33, from each of which runs a belt 34, one of the belts, being twisted, these belts being respectively shiftable on pulleys 35 which are fixed on a shaft 36, on the end of 70 which is a gear 37 engaging a pinion on the shaft of a motor 38. Automatic reversal of operation of the worm shaft 32 is secured by the employment of any suitable reversing mechanism, in the present embodiment comprising a longitudinally shiftable belt-shifting rod 39, mounted in appropriate bearings, this rod having tappets 40 in suitably spaced relation thereon, and adapted to alternately engage with a striker 41 which is mounted on the slide or cross-head 28.

The worm-drive mechanism, just above described, is mounted together with the worm 32 on a turn-table 42 supported on suitable anti-friction bearings 43, and having an annular rack 44 engaged and driven by a pinion on the shaft of a suitable motor 45. The turn-table 42 is shown as provided with a central transversely or diametrically extending slot 46, in which the lower end 90 section 5^a of the column or shaft 5 is guided for movement longitudinally only in accordance with the path of movement of the slide or cross-head 28.

From the above it will be seen that when 95 the apparatus is idle, the carrier 2 may be caused to stand in a horizontal or level position to enable the embarking or disembarking of passengers, and at a suitable time the several motors 27, 38 and 45 can 100 be independently and concurrently operated to secure a desired movement of the carrier 2 for the amusement of the passengers. First, the upright column 5 may be tilted to and fro on its gimbal bearing by 105 the simple operation of motor 38, which will cause the carrier to tilt as its shaft or post is oscillated. The elements of such tilting motion are shown by the dotted lines A A' in Fig. 9, and by starting the motor 110 45, while this tilting motion is being maintained, the carrier will be caused to whirl about its own axis by the motor 27, as indicated by dotted line B in Figure 9. The turn table 42 may be rotated by the motor 115 45, and thereby cause the column 5 to describe an orbit in what I here term conical volutes provided motor 38 is in continuous operation. These combinations of movements causing the passengers to be carried 120 in, complex orbit or path, the effects of which may be widely varied by varying the relative speeds of rotation or action of the different elements.

It is desirable that a suitable swivel joint 125 be provided between the extension 5^a which forms a race for a ball bearing 51 the opposite race of which is formed by a hub or flange 52 secured on the round end of the column 5 and a head secured to the member 130

5^a. There may extend upwardly into the hollow column 5 a thrust rod or stem 53 for obvious purposes.

Having thus described my invention, 5 what I desire to claim is:

1. In an amusement apparatus, a carrier for passengers, a universally tilttable non-rotatable column on which the carrier is rotatably mounted, a power mechanism 10 mounted on the column for rotating the carrier about its axis, a turn-table provided with a guide for the lower end of the column, and a power mechanism mounted on a fixed base for rotating the turn-table.
- 15 2. In an amusement apparatus, a carrier for passengers, a universally tilttable non-rotatable column on which the carrier is rotatably mounted, mechanism mounted on said column for rotating the carrier about 20 its axis; a turn-table carrying a guide for the lower end of said column, means for rotating said turn-table, and means for oscillating the end of the column in said guide.
- 25 3. In an apparatus of the character described, a carrier having suitable seating arrangements; an oscillating support on which the carrier is pivotally mounted to swing about the axis of the support, and 30 means on the support for rotating the carrier independently of the oscillations of the

support, and rotary means for oscillating and revolving the support in an orbit independent of the means for rotating the carrier.

35

4. In an amusement apparatus, a non-rotatable column, a universally tilttable support for said columns between its ends, a counter-balancing device on the column below the tilttable support and means for 40 swinging the column.

5. In an amusement apparatus, a carrier for passengers, a universally tilttable non-rotatable column on which said carrier is rotatably mounted, a guide member swiv- 45 elled to the lower end of said column and a turn table carrying a guide arranged to cooperate with said guide member.

6. In an amusement apparatus, a carrier for passengers, a universally tilttable non-rotatable column on which the carrier is rotatably mounted, a power mechanism mounted upon the column for rotating the carrier about its axis, a turn table provided with a guide for the lower end of the col- 50 umn, a power mechanism mounted on a fixed base for rotating the turn table and a power mechanism mounted on the turn table for oscillating the column.

In testimony whereof I affix my signature. 60

ERNEST KOHLER.