A. GORDON.

MECHANICAL AMUSEMENT DEVICE.

APPLICATION FILED APR. 1, 1915.

1,147,391.

Patented July 20, 1915.

4 SHEETS—SHEET 1.

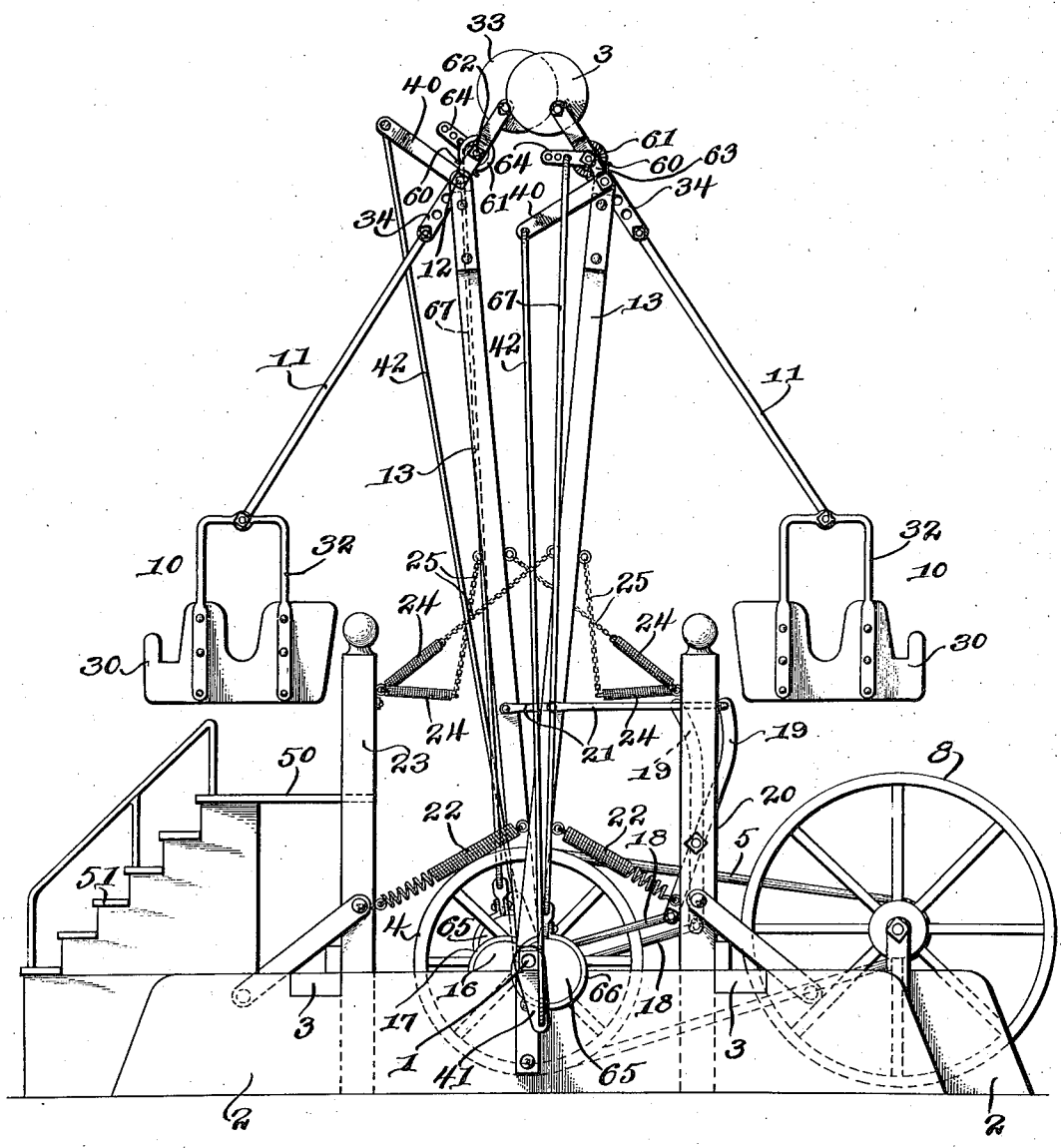

Fig. 1.

Witnesses,
Jno. P. Woodworth
L. E. Davis

Inventor
A. GORDON.

By Langdon Moore
Attorney

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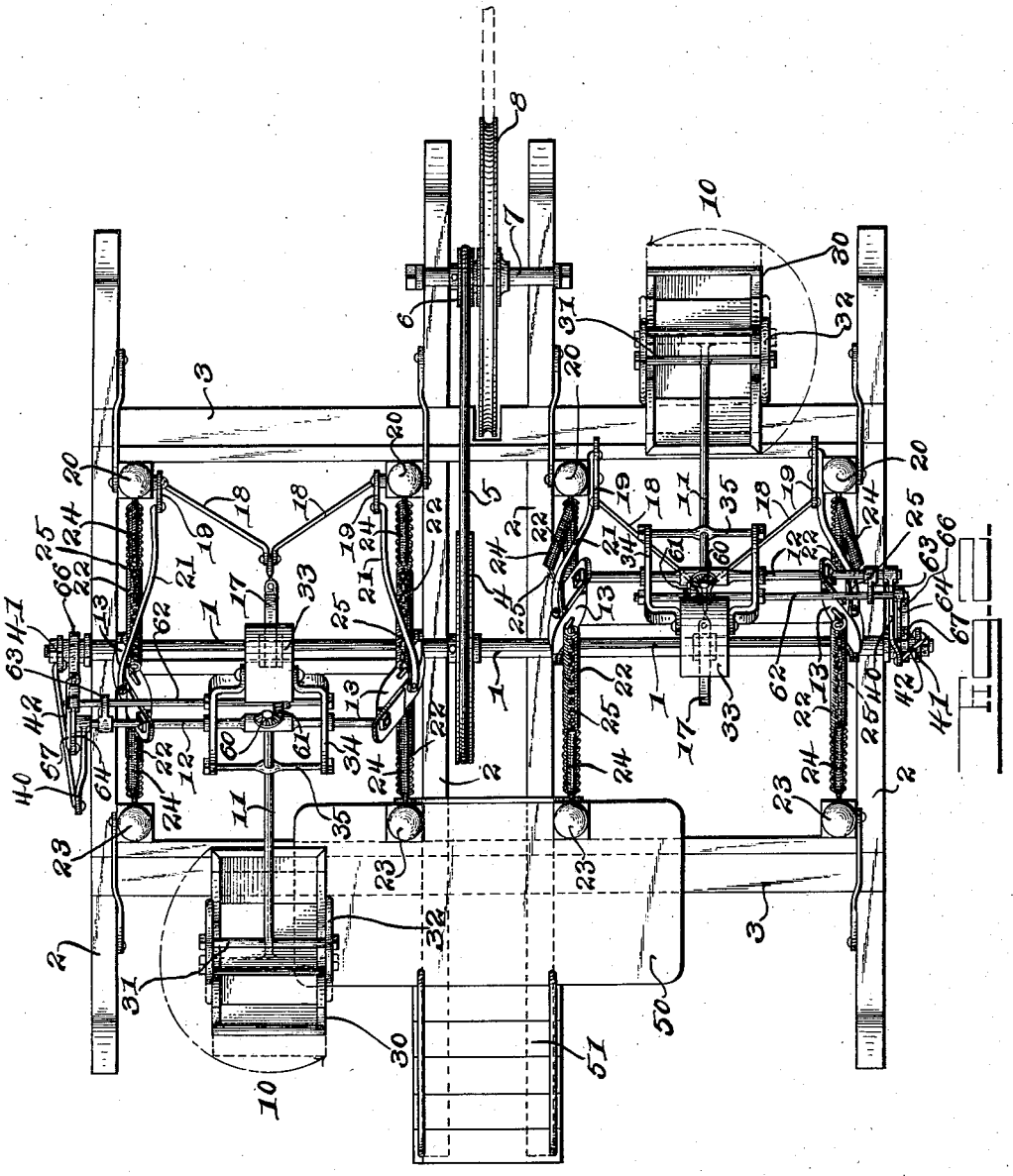

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Jno. T. Woodworth
L. L. Davis

Inventor
A. GORDON.

By Langdon Mowe

Attorney

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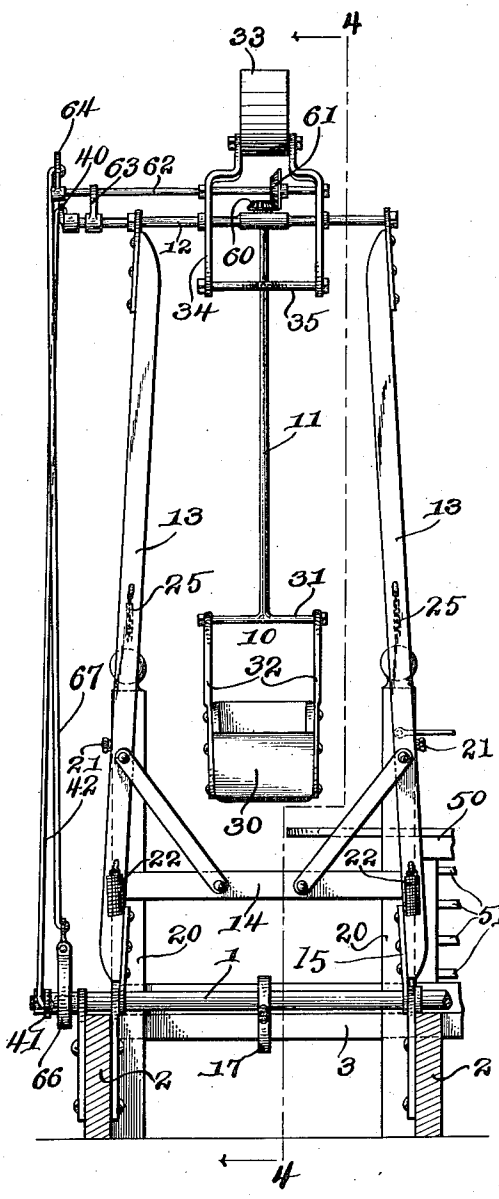

Fig. 3.

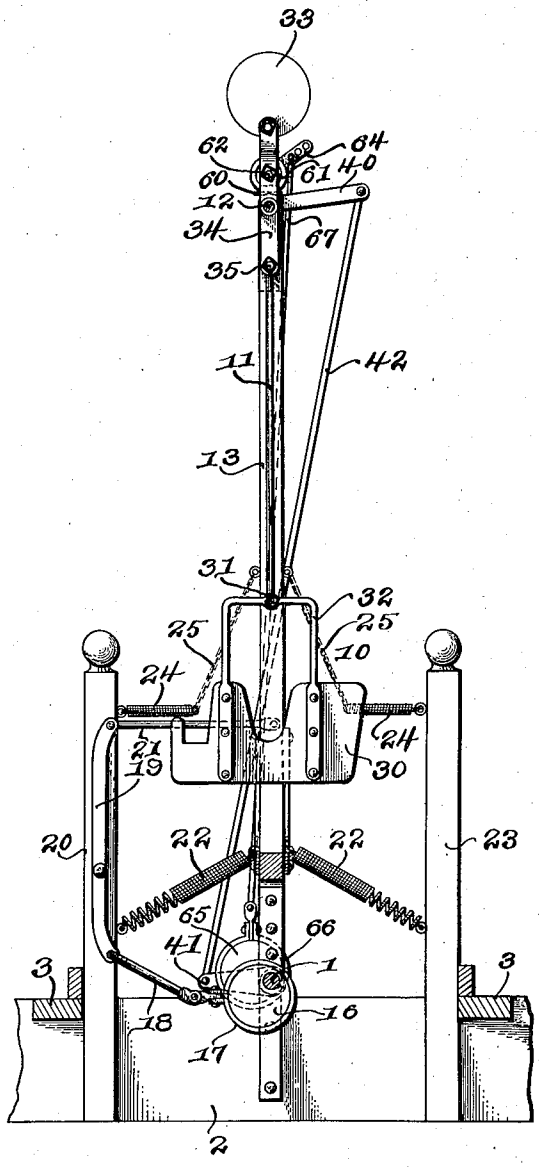

Fig. 4.

Witnesses
Jno. P. Woodworth.
A. E. Davis

Inventor
A. GORDON.

By Langdon Moore
Attorney

A. GORDON.

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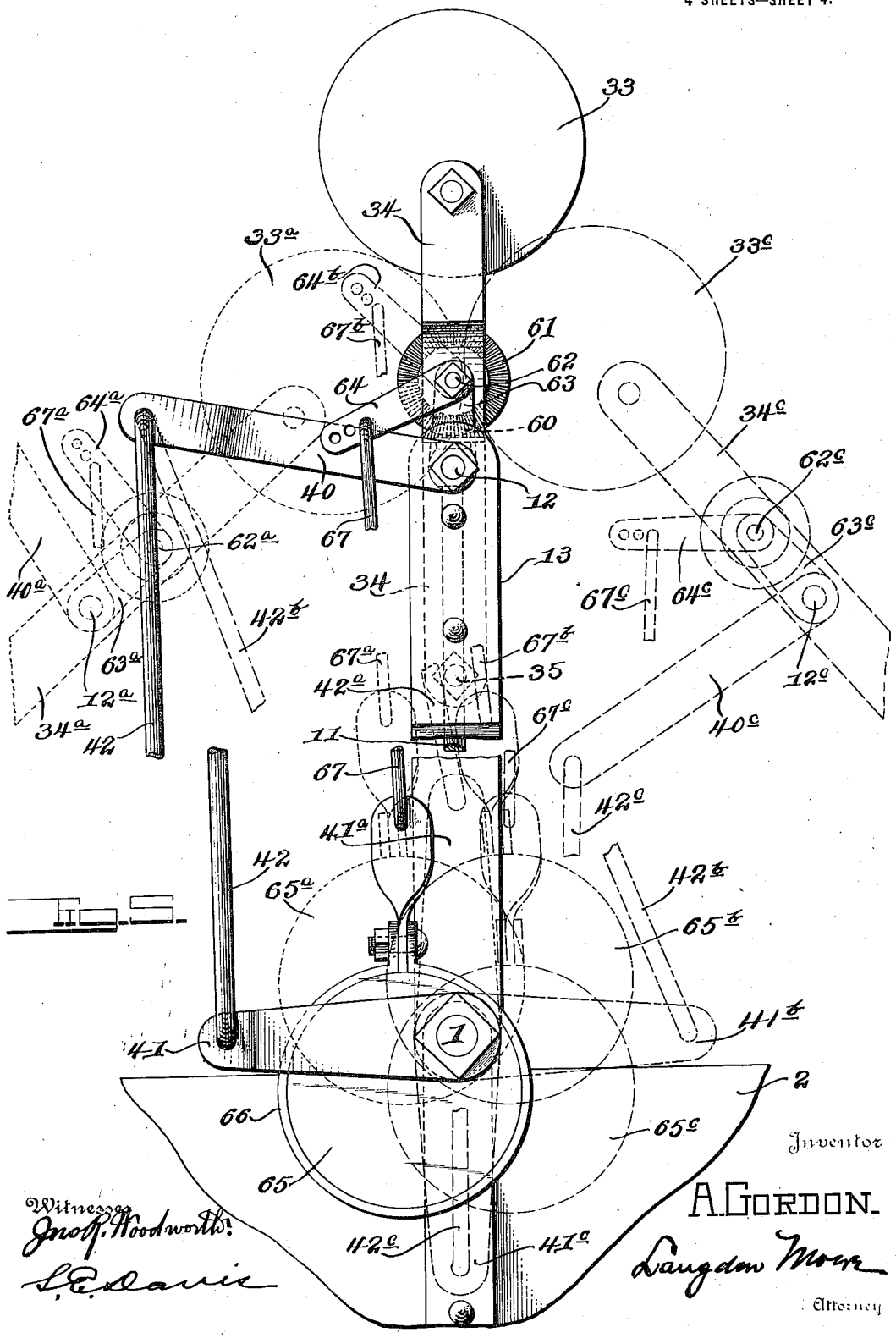

Witnesses
Jno. P. Woodworth.
L. E. Davis

Inventor
A. GORDON.
Langdon Morse
Attorney

UNITED STATES PATENT OFFICE.

ALVIN GORDON, OF LEXINGTON, NEBRASKA.

MECHANICAL AMUSEMENT DEVICE.

1,147,391. Specification of Letters Patent. Patented July 20, 1915.

Application filed April 1, 1915. Serial No. 18,446.

To all whom it may concern:

Be it known that I, ALVIN GORDON, a citizen of the United States, residing at Lexington, in the county of Dawson and State of Nebraska, have invented new and useful Improvements in Mechanical Amusement Devices, of which the following is a specification.

This invention relates to improvements in amusement devices and more particularly to a mechanically operated swing.

It is the object of this invention to construct a mechanically operated swing that will be positively operated through an equal arc during each oscillation in which the passenger carrying car will approach and recede from the end of travel in both directions without a shock or jar.

It is a further object to construct the swing so that the passenger car will be caused to turn through a half revolution at the end of each oscillation.

This swing is of particular utility in amusement places and parks. It is mechanically operated and will stop mechanically for passengers to embark or leave the car. It will produce a new thrill to the passengers in its turning movement at end of each oscillation and will allow the passengers to always face the direction of travel thereby avoiding the peculiar effect of having one's back in that direction during one of the oscillations.

While the preferred form of this invention is illustrated upon the accompanying sheets of drawing yet it is to be understood that minor detail changes may be made without departing from the scope thereof.

Figure 1 is a view in side elevation of this apparatus. Fig. 2 is a top plan view illustrating the position of the swings in full lines just before the turning movement at the end of their oscillation and in dotted lines the path of the carriage during the turning movement. Fig. 3 is a view in front elevation of a single swing when the swing and supports are in a vertical position. Fig. 4 is a transverse sectional view taken on the lines 4—4 looking in the direction of the arrow on Fig. 3 with parts in side elevation. Fig. 5 is an enlarged diagrammatical view in side elevation, with parts broken away, illustrating the operation of various elements.

The accompanying drawing illustrates an embodiment of this invention in a double swing for the easy understanding of the mechanical operation, which may be applied to either one or a plurality of swings operating at the same time, and comprises a transverse operating shaft 1 mounted in bearings carried centrally upon longitudinal supports 2 arranged on each side of each swing and preferably connected by transverse braces 3 to form a rigid base. The operating shaft 1 may be actuated in any desired manner and is illustrated as being provided with a pulley 4 connected by a belt 5 to a smaller pulley 6 upon a shaft 7 mounted at the rear of and between the swings upon the adjacent longitudinal supports and is provided with a belt pulley 8, preferably of greater diameter than the operating shaft pulley, adapted to be driven from any source of power, such as a steam or gas engine, not shown.

Each swing seat or passenger car 10 is attached to the lower end of a swing rod 11 depending from a transverse swing shaft 12 mounted to oscillate in bearings at the top of two supporting arms 13 arranged on each side of the car, secured rigidly to each other by transverse braces 14 adjacent their bottom, with the lower ends mounted upon bearings 15 upon the adjacent longitudinal base supports 2 concentric with the operating shaft.

Each pair of swing supporting arms 13 is caused to oscillate upon the bearings by an eccentric cam 16 keyed to the operating shaft 1, preferably midway between the arms, having its strap 17 pivoted to two diverging eccentric rods 18 pivoted at the other ends each to the lower ends of two vertical oscillating levers 19, which are pivoted intermediate their lengths to vertical posts 20 arranged equidistantly at the rear of the swinging arms on each side and secured to the longitudinal base support 2, with a horizontal connecting rod 21 pivotally connecting the upper ends of each vertical oscillating lever 19 to each supporting arm 13. The relation of the eccentric 16 and the pivotal points of the vertical oscillating levers 19 is such that upon rotation of the operating shaft the supporting arms 13 will be caused to oscillate or rock upon their lower ends. To act as a resilient stop to prevent a shock or jolt at each end of each oscillation downwardly inclined coiled tension springs 22

are secured to the front and rear of each supporting arm 13 a distance above its lower end, preferably about the distance of the transverse brace 14, with the springs on the rear leading to the posts 20 at the rear of the base and the springs on the front leading to similarly positioning posts 23 upon the front of the base with these springs always under a certain amount of tension. To act as a further stop and to relieve the cam, lever and connecting rod mechanism of strain additional coil springs 24 are secured adjacent the top of each of the four posts and are connected by a chain or other flexible connection 25 to the opposite sides of the supporting arms 13 at substantially the center point, so that the upper springs 24 are only placed under tension when the arms pass their vertical position in their movements away from such springs.

The cars or swing seats 10 are preferably provided with two transverse seats in a rectangular body 30, as illustrated, and are attached to a rigid cross bar 31 upon the lower end of the swing rod 11 by straps 32 which may be either rigidly secured thereto or pivoted thereon as desired. The upper end of the swing rod 11 passes centrally through and is carried by the transverse swinging shaft 12. A counter weight 33 is mounted above the swing shaft in a frame comprising sides 34 having apertures therein for the passage of the shaft 12 and a bottom cross piece 35 having a central aperture for the passage of the swing rod 11.

In order to positively oscillate the swing rod and car by the mechanically operated mechanism, as well as positively control the movement of the car by such mechanism, and also cause the car to swing in time with the rocking of the supporting arms, and to equally limit the amount of such swing absolutely each time, a crank 40 is rigidly attached at one end of the transverse swing shaft 12 which is connected to a crank 41 rigidly secured upon the operating shaft 1. The free ends of the cranks 40 and 41 are each pivoted to the opposite ends of a rigid connecting rod 42. The positions and relations of the two cranks and their connections to the operating shaft 1 and cam 16 are such that as the cam oscillates the swing supporting arms 13 in one direction the crank also turns the transverse swing shaft 12 to cause the car to also oscillate in that direction through a greater angle of oscillation than the arm swings. By this construction the amount of oscillation of the car is always uniform and positive, the speed of the car is at all times dependent upon the speed of the operating shaft and the car can be stopped positively and held stationary by the operating mechanism. It is preferable to provide a platform 50 with steps 51 leading up to it upon the front of the base support from which passengers may embark or leave the car.

In order that a half turn may be imparted to the car at the end of travel of each oscillation so that the occupants will always face in the direction of travel while swinging, the swing rod 11 is rotatably mounted or carried upon the swing shaft 12, passes therethrough and is provided upon its upper end with a miter gear wheel 60 meshing with a miter gear wheel 61 carried upon a secondary shaft 62 mounted parallel to the swing shaft 12 in the sides 34 of the counter weight frame. The secondary shaft 62 extends beyond the crank carrying end of the shaft 12, and passes through a bracket bearing 63 rigidly secured thereto adjacent the crank 40. In order to impart rotation to the secondary shaft the free end beyond the bracket bearing 60 is provided with a rigid crank arm 64 and the operating shaft 1 adjacent the crank 41 is provided with an eccentric cam 65 having a strap 66 and a pivoted eccentric rod 67 pivotally connected to the secondary shaft 64.

The construction, size, and relation of the miter gears, secondary shaft crank, eccentric rod, and eccentric cam are such that during the oscillation of the swing and rotation of the swing shaft imparted by the operating shaft, the secondary shaft will remain inactive until the end of the travel in each direction is nearly reached then the cam 65 will through its eccentric rod 67 and crank 64 impart a partial rotation to a secondary shaft which will through the miter gears 60 and 61 give a half turn to the swing shaft 11 and thereby to the car. This construction and operation are more thoroughly indicated in the diagram of Fig. 5 of the drawing which illustrates in full lines the one position assumed by the mechanism for turning the car as it passes the vertical during its oscillation.

As the operating shaft rotates in a clockwise direction from the position shown in full lines the swing supporting arms 13 will be caused to travel toward the end of oscillation to the left which is reached when the shaft 1 has made a quarter revolution. During this travel of the arms 13 the swing shaft 12 describes an arc to the position 12^a, and at the same time the lever 41 is brought to the position 41^a with the cam 65 to the position 65^a, all of which are indicated in dotted lines. The connecting rod 42 between the cranks 40 and 41 will push the crank 40 upward to position 40^a which will turn the shaft 12 during its travel and cause the rod 11 to swing outward to the position of the counter weight 33^a and bracket 34^a with the bracket bearing in the position of 63^a and supplemental shaft in the position 62^a. As the shaft 62 is mounted upon the upper end of the bracket 63 carried upon

the pivoted end of the crank 40 and carries on its end the crank 64 which is connected to the eccentric rod 67 with the eccentric cam 65, the shaft 62 will travel through a different path from the shaft 12 as the parts move from the full line position to the dotted line position upon the left of Fig. 5. The throw of the eccentric rod 67 is different from the throw of the connecting rod 42 and the relation of the movement of the bracket 63 to the throw of the eccentric rod 67 is such that the shaft 62 in moving to the position 62^a remains inactive or is held against rotation until the end of movement is approached when the throw of the eccentric rod 67 imparts a sufficient rotation to the shaft 62 to operate the gears 60 and 61 to turn the rod 11 and car 10 carried thereby through a half revolution.

Upon a further quarter revolution of the operating shaft 1 the supporting arms 13 will be brought back to vertical position as the crank 41 assumes the position of 41^b with the connecting rod 42 to position 42^b and the cam 65 will assume the position of 65^b with eccentric rod 67 in the position 67^b, all positions indicated in dots and dash lines. During this movement the connecting rod 42 pulls the crank 40 downward from the position of 40^a back to the first position shown in full lines but the eccentric rod 67 pushes the secondary shaft crank 64 upward to the position 64^b, but this shaft remains inoperative during such movement holding the car in parallel relation to the direction of travel.

Upon a rotation of the operating shaft 1 through another quarter revolution the supporting arms 13 will be caused to travel toward the other end of oscillation toward the right and during this travel the swing shaft 12 describes an arc to the position 12^c and at the same time the crank 41 is brought to the position 41^c with the cam 65 to the position 65^c, all of which are indicated in dash lines. The connecting rod 42 in assuming the position 42^c will pull the crank 40 downward to the position 40^c which will turn the shaft 12 during its travel and cause the rod 11 to swing outward to the position of the counter weight 33^c and bracket 34^c with bracket bearing 63 in the position 63^c and supplemental shaft in the position 62^c. The throw of the eccentric rod 67 in assuming the position 67^c as cam 65 moves from 65^b to 65^c though the crank 64 will maintain the supplemental shaft 62 inoperative until near the end of travel when the throw of the eccentric rod 67^c will impart to the shaft 62 a half revolution, in the same direction as the revolution at the opposite end of travel, which will be transmitted to the car 10 through the rod 11 and gears 60 and 61. Upon completing the revolution, a movement of one-quarter turn from the position indicated in dash lines, the parts will be brought back to the position first described and indicated in full lines.

The eccentric cam 16, eccentric rods 18, levers 19, and connecting rods 21 control the oscillation of the swing supporting arms 13 while the cranks 40 and 41 through their connecting rod 42 control the rocking of the swing shaft 12 and thereby the oscillation of the car 10. The eccentric cam 65, eccentric rod 67, and crank 64 control the rotation of the supplemental shaft 62 whereby the car is rotated through gears 60 and 61 at the end of each oscillation but held in the plane of the direction of travel at all other times.

It is to be understood that swings in accordance with this invention can be constructed singly, in pairs, or any number desired and actuated by the same operating shaft and when more than one are so constructed they may be caused to oscillate together, alternately or in any desired relation to each other by proper adjustment in securing the swing supporting arms, eccentric cam, the swing operating crank and the supplemental shaft operating eccentric cam upon the operating shaft for each swing.

What I claim is:—

1. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a car suspended between the arms, a driven operating shaft, an eccentric cam upon the operating shaft and connections between the cam and arms to oscillate the arms upon their bearings.

2. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a car suspended between the arms, a driven operating shaft, an eccentric cam upon the operating shaft, a pair of vertical pivoted levers, a pair of eccentric rods connecting one end of each lever to the cam, and a connecting rod from the other end of each lever to a supporting arm, whereby rotation of the operating shaft oscillates the arms upon their bearings.

3. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a car suspended between the arms, a driven shaft, means actuated by the operating shaft to oscillate the arms upon their bearings, and springs under constant tension secured to the base and arms to absorb the shock of the reversal of movement at the end of each oscillation.

4. In a mechanically operated swing, a base, swing supporting arms having their ends mounted in bearings upon the base, a car suspended between the arms, a driven operating shaft, means actuated by the operation of the operating shaft to oscillate the arms upon their bearings, means to re-

tard the movement of the arms at each end of oscillation, and additional normally inoperative shock absorbers actuated upon the approach of the arms to the end of oscillation.

5. In a mechanically operated swing, a base, swing supporting arms having their ends mounted in bearings upon the base, a car suspended between the arms, a driven operating shaft, means actuated by the operated shaft to oscillate the arms upon their bearings, springs under constant tension secured to the base and arms to absorb the shock of the reversal of movement at the end of each oscillation, and additional tension springs secured to base and flexibly connected to substantially the center of the arms whereby the said springs are brought under tension as the arms approach the end of oscillation.

6. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a driven operated shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a car suspended between the arms, and means actuated by the operating shaft to oscillate the car during the oscillation of the arms.

7. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a driven operated shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a car suspended between the arms, and means actuated by the operating shaft to oscillate the car during the oscillation of the arms through a greater arc of travel than the travel of the arms.

8. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a driven operated shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a swing supported shaft carried between the arms, a swing rod carried thereby, a car suspended from the rod, and means actuated by the operating shaft to rock the swing shaft during the oscillation of the arms to cause the car to travel through a greater arc of movement than the arms.

9. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, an operating shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a swing supporting shaft carried between the arms, a swing rod carried thereby, a car suspended from the rod, and means actuated by the operating shaft to rock the swing shaft during the oscillation of the arms to cause the car to travel through a greater arc of movement than the arms during their oscillation, comprising a crank arm carried upon the operating shaft, a crank arm upon the swing shaft, and a connecting rod joining two crank arms.

10. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a driven operating shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a car suspended between the arms, means actuated by the operating shaft to oscillate the car during the oscillation of the arms, and means actuated by the operating shaft to turn the car through a half revolution at each end of oscillation.

11. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a driven operating shaft, a connection between the shaft and arms for oscillating the arms upon their bearings, a car suspended between the arms, means actuated by the operating shaft to oscillate the car during the oscillation of the arms, and means actuated by the operating shaft to turn the car through a half revolution at the end of each oscillation and maintain the car in the plane of the direction of travel during the oscillation.

12. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a connection between the operating shaft and arms to oscillate the arms upon their bearings, a swing supporting shaft mounted between the arms, a swing rod suspended from and passing through the swing shaft, a car carried upon the lower end of the rod, a connection between the operating shaft and swing shaft to rock the swing shaft during oscillation of the arms, a supplemental shaft, mounted above the swing shaft, a gear wheel upon said supplemental shaft a gear upon the upper end of the swing rod meshing with said gear, and means actuated by the operating shaft to impart a partial rotation to the supplemental shaft at the end of each oscillation of the arm to turn the car through a half revolution.

13. In a mechanically operated swing, a base, swing supporting arms having lower ends mounted in bearings upon the base, a connection between the operating shaft and arms to oscillate the arms upon their bearings, a swing supporting shaft mounted between the arms, a swing rod suspended from and passing through the swing shaft, a car carried upon the lower end of the rod, a connection between the operating shaft and swing shaft to rock the swing shaft during oscillation of the arms, a supplemental shaft mounted above the swing shaft, a gear wheel

upon said supplemental shaft, a gear upon the upper end of the swing rod meshing with said gear, and means actuated by the operating shaft to impart a partial rotation to the supplemental shaft at the end of each oscillation of the arm to turn the car through a half revolution, comprising an eccentric cam upon the operating shaft, a crank arm upon the supplemental shaft, and an eccentric rod from the cam pivoted to the supplemental shaft crank arm.

14. In a mechanically operated swing, a base, swing supporting arms having their lower ends mounted in bearings upon the base, a connection between the operating shaft and arms to oscillate the arms upon their bearings, a swing supporting shaft mounted between the arms, a swing rod suspended from and passing through the swing shaft, a car carried at the lower end of the rod, a connection between the operating shaft and swing shaft to rock the swing shaft during oscillation of the arms, a supplemental shaft mounted in a frame rocking with the swing shaft and swing rod above the swing shaft, a gear wheel upon supplemental shaft, a gear wheel upon the upper end of the swing rod meshing therewith, and an eccentric cam upon the operating shaft, a crank arm upon the supplemental shaft, an eccentric rod from the cam pivoted to the supplemental shaft crank arm to impart a partial rotation to the supplemental shaft at each end of oscillation of the arm to turn the car through a half revolution and maintain the car in the plane of the direction of travel during the remainder of the oscillation.

15. In a mechanically operated swing, a base, swing supporting arms thereon, a swing supporting shaft carried between the arms, a swing rod suspended therefrom, a car carried upon the lower end of the rod, a frame upon the swing shaft in line with the rod, a connection between the frame and the rod below the swing shaft, a counter weight supported by the frame of the swing shaft, an operating shaft, a crank arm upon the operating shaft, a crank arm upon the swing shaft, and a connecting rod joining the crank arms whereby the operating shaft rocks the swing shaft to oscillate the car.

16. In a mechanically operated swing, a base, swing supporting arms thereon, a swing supporting shaft carried between the arms, a swing rod suspended therefrom, a car carried upon the lower end of the rod, a frame upon the swing shaft in line with the rod, a connection between the frame and the rod below the swing shaft, a counter weight supported by the frame above the swing shaft, an operating shaft, and a connection from the operating shaft to rock the swing shaft for oscillating the car.

17. In a mechanically operated swing, a base, swing supporting arms thereon, a swing supporting shaft carried between the arms, a swing rod suspended therefrom and passing therethrough, a car carried upon the lower end of the rod, a frame upon the swing shaft in line with the rod, a connection with the frame and the rod below the swing shaft, a counter weight supported by the frame above the swing shaft, an operating shaft, a connection therefrom for rocking the swing shaft to oscillate the swing car, a supplemental shaft mounted in the frame above the swing shaft, a gear upon said supplemental shaft, a gear upon the upper end of the swing rod meshing therewith, and a connection between the supplemental shaft and operating shaft for imparting a half revolution to the swing car at each end of oscillation.

18. In a mechanically operated swing, a base, swing supporting arms thereon, a swing supporting shaft carried between the arms, a swing rod suspended therefrom and passing therethrough, a car carried upon the lower end of the rod, a frame upon the swing shaft in line with the rod, a connection between the frame and the rod below the swing shaft, a counter weight supported by the frame above the swing shaft, an operating shaft, a crank arm upon the operating shaft, a crank arm upon the swing shaft, and a connecting rod joining the two cranks whereby the operation of the shaft rocks the swing shaft to oscillate the swing car, a supplemental shaft mounted in the frame above the swing shaft, a gear upon said supplemental shaft, a gear upon the upper end of the swing rod meshing therewith, a crank arm upon the supplemental shaft, an eccentric cam upon the operating shaft, an eccentric rod from the cam connected to the supplemental shaft crank whereby the supplemental shaft is held inoperative during the rocking of the swing shaft and imparts a half revolution to the swing rod at each end of travel of the swing car.

ALVIN GORDON.

Witnesses:
I. J. NISLEY,
A. A. CRAIG.