July 21, 1959 N. BARTLETT 2,895,735

AMUSEMENT RIDE

Filed Nov. 4, 1957 4 Sheets-Sheet 1

Fig. 1.

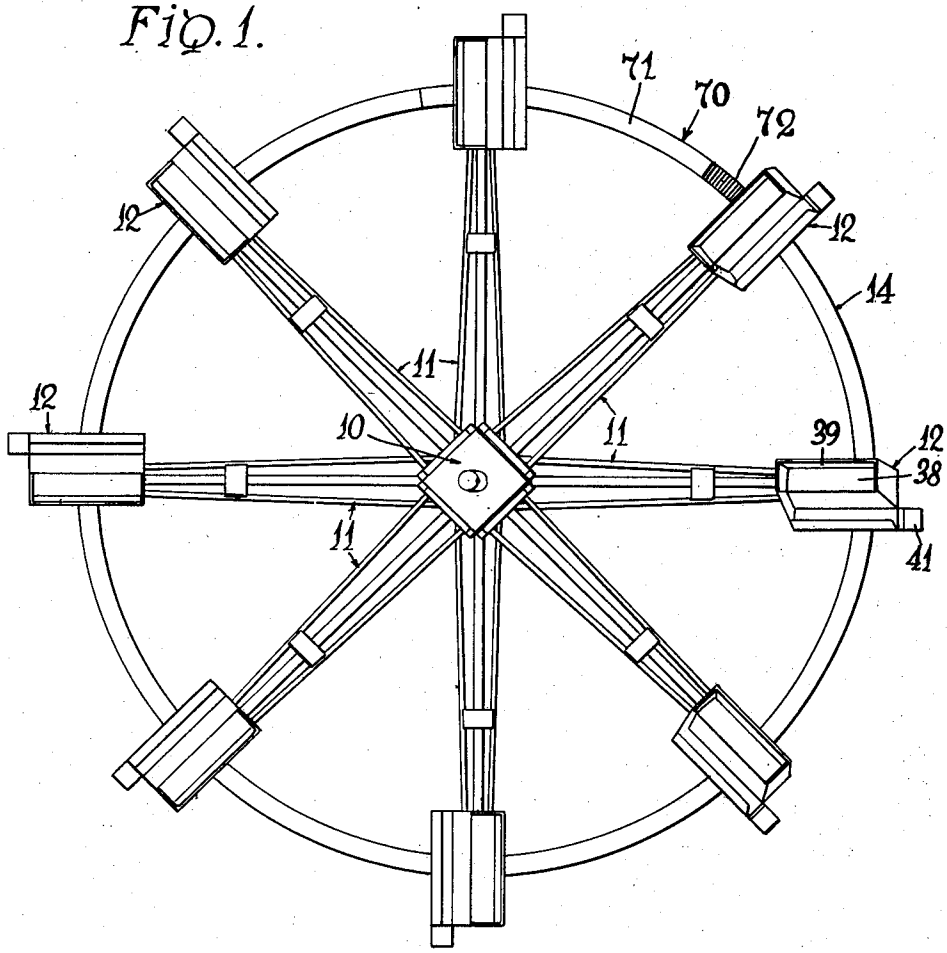
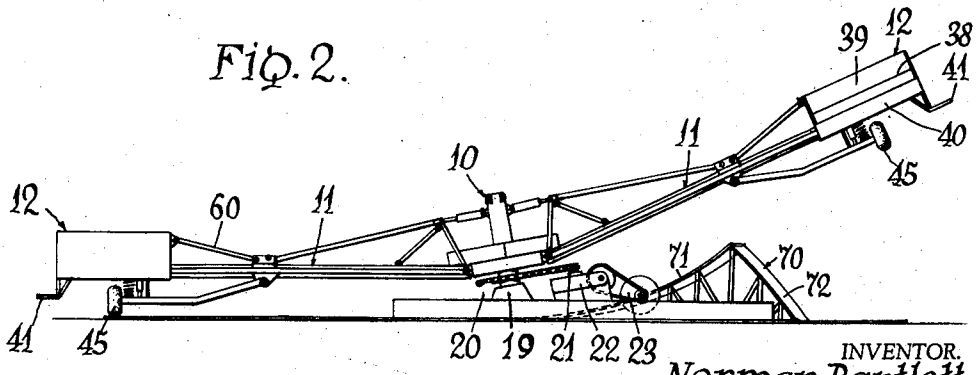


Fig. 2.



INVENTOR.
Norman Bartlett,
BY
Beau, Brooks, Buckley & Beau
ATTORNEYS.

July 21, 1959 N. BARTLETT 2,895,735

AMUSEMENT RIDE

Filed Nov. 4, 1957 4 Sheets-Sheet 2

Fig. 3.

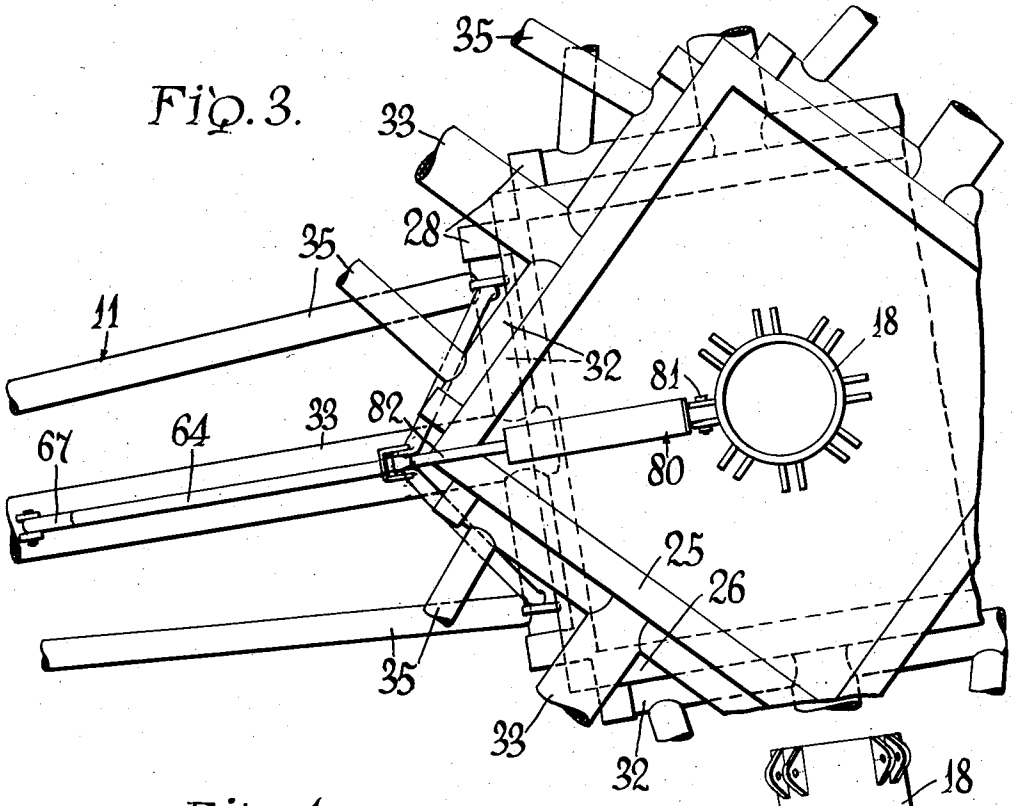
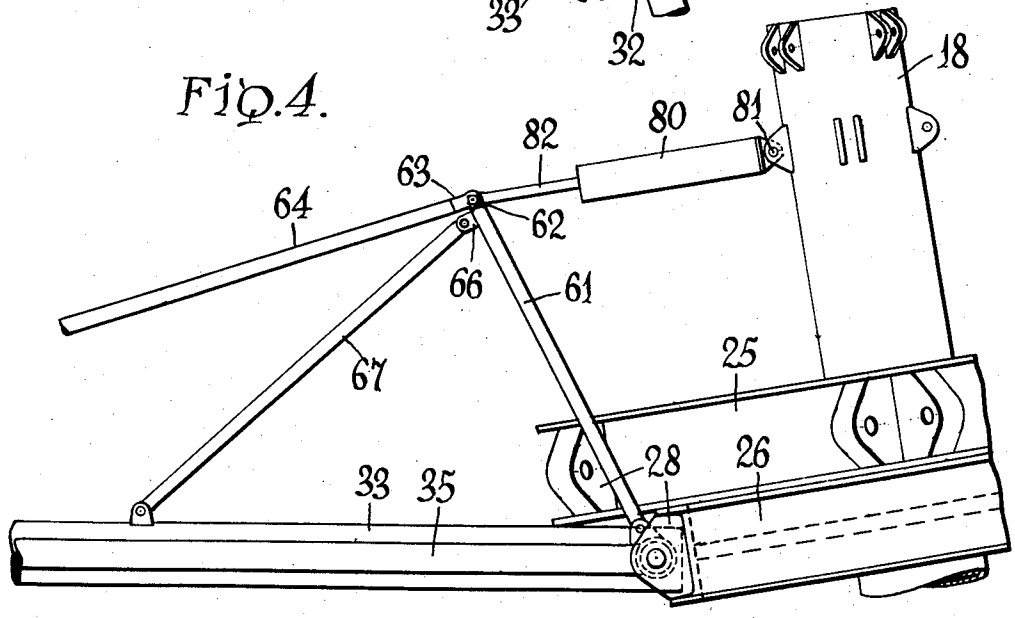


Fig. 4.



INVENTOR.
Norman Bartlett,
BY
Beam, Brooks, Buckley & Beam
ATTORNEYS.

July 21, 1959 N. BARTLETT 2,895,735

AMUSEMENT RIDE

Filed Nov. 4, 1957 4 Sheets-Sheet 3

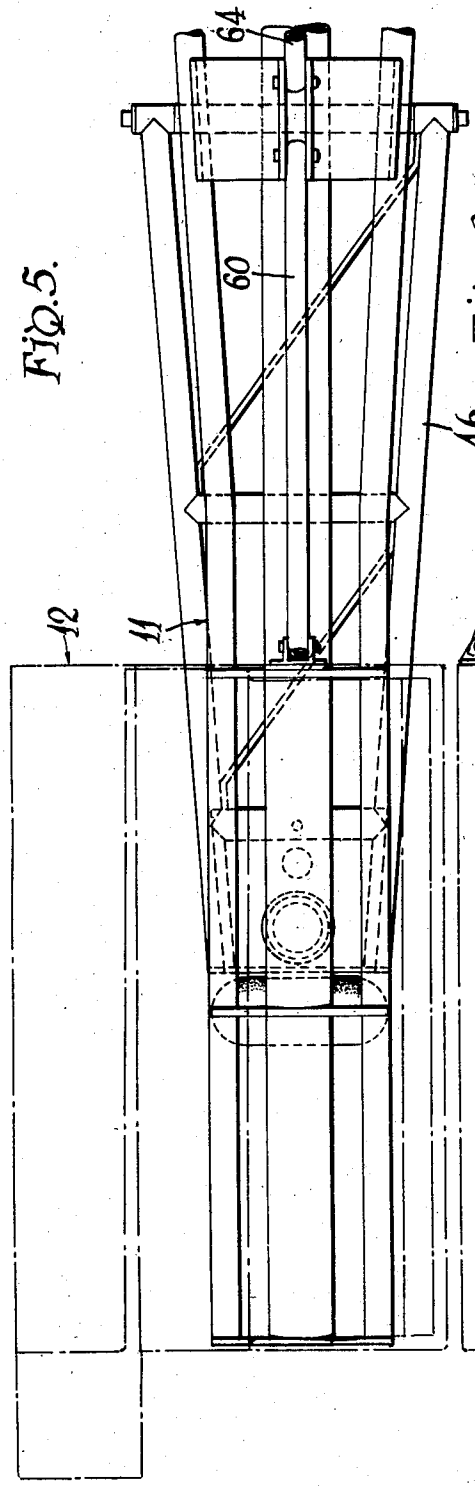


Fig. 5.

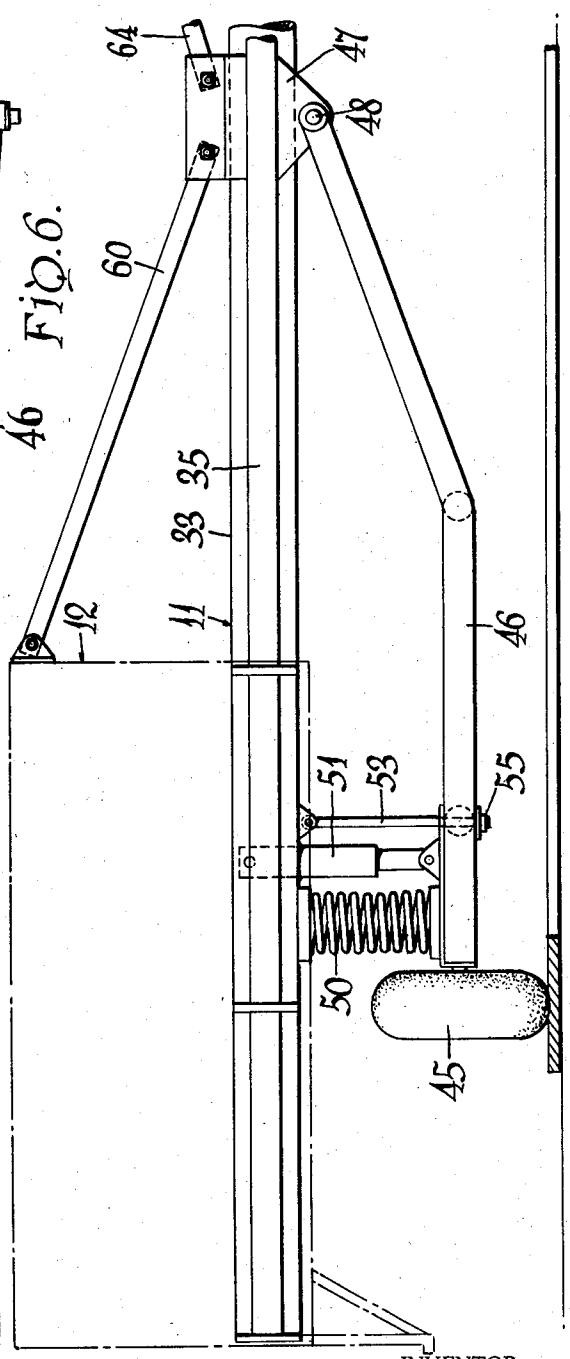


Fig. 6.

INVENTOR.
Norman Bartlett,
BY
Bean, Brooks, Buckley & Bean.
ATTORNEYS.

July 21, 1959 N. BARTLETT 2,895,735

AMUSEMENT RIDE

Filed Nov. 4, 1957 4 Sheets-Sheet 4

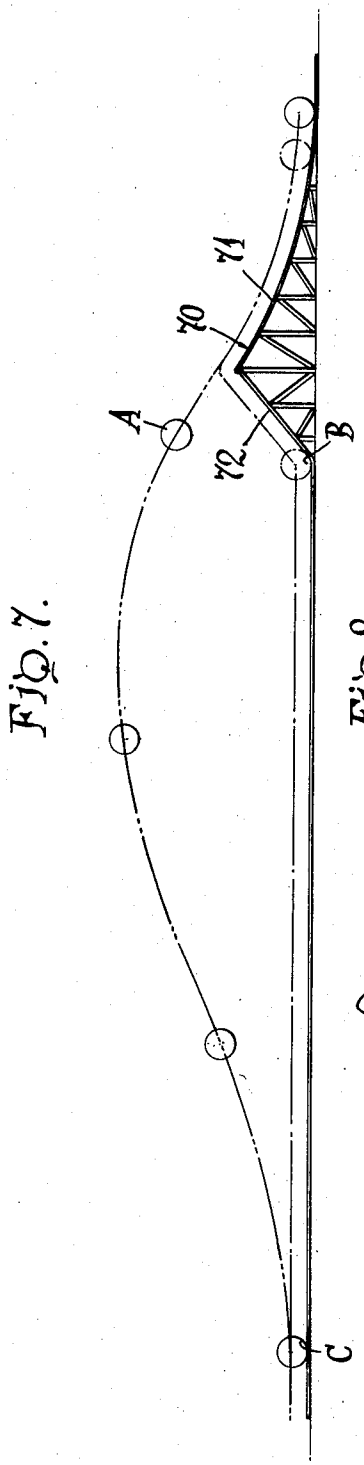


Fig. 7.

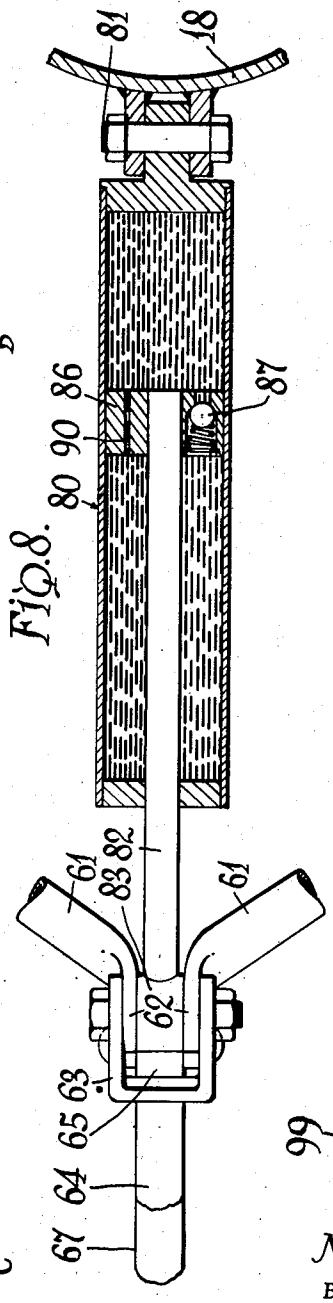


Fig. 8.

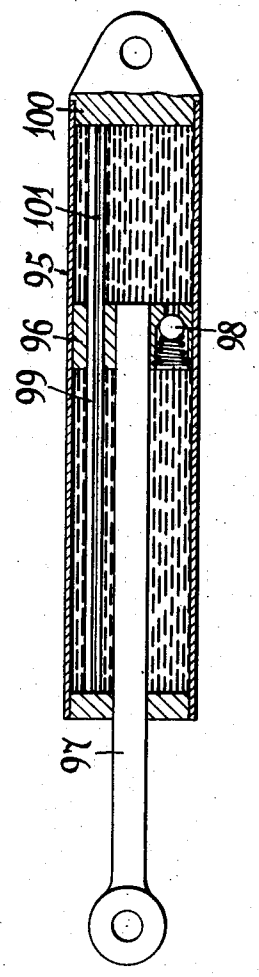


Fig. 9.

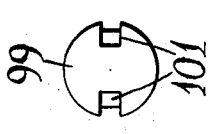


Fig. 10.

INVENTOR.
Norman Bartlett,
BY
Beau, Brooks, Buckley & Beau.
ATTORNEYS.

United States Patent Office 2,895,735 Patented July 21, 1959

2,895,735

AMUSEMENT RIDE

Norman Bartlett, North Miami Beach, Fla., assignor of one-half to Marjorie Bartlett, North Miami Beach, Fla.

Application November 4, 1957, Serial No. 694,337

11 Claims. (Cl. 272—51)

This invention relates to amusement rides and more particularly to an amusement ride of the roundabout type.

The present invention provides an amusement ride embodying a circular series or succession of passenger cars which are rotated about a common center and wherein each passenger car or carrier, in the course of its circular path, ascends a ramp and jumps therefrom a distance generally proportionate to the speed which the carrier has attained at the time. The apparatus of the present invention provides, in conjunction with the foregoing jump action of the passenger cars or carriers, novel means for controlling the descent of each passenger car or carrier after it has jumped clear of the aforesaid ramp.

The arrangement for thus controlling and arresting the descent of each passenger car or carrier is such as to give the illusion of an entirely free jump and descent, both as to the passengers and as to onlookers, despite the fact that the control means is safe and secure and provides for lowering of the passengere cars or carriers from the crest or zenith of the jump with a minimum of impact or shock as the cars reach the flat portion of their path of movement.

The arrangement of the ride of the present invention is such that the ramp terminates abruptly at the take-off point, preferably in a rather sharply inclined surface which drops to the level of the flat portion of the circular pathway of the cars or carriers. In the general embodiment set forth herein by way of example hydraulic piston and cylinder means connect between each car or carrier and a relatively fixed point on the ride structure in such a way that relative movement of the piston and cylinder in opposite directions accompanies relative vertical movements of the associated car or carrier.

More specifically, such relatively fixed point is conveniently located on the rotatable central support structure to which the cars or carriers are attached by arms which radiate from the central support and are pivoted thereto on horizontal axes for raising and lowering movements of the arms. The hydraulic means is of the single acting type so that virtually no hydraulic resistance obtains when a car or carrier is moving relatively upwardly. However, upon relative downward movement, as when a car or carrier has cleared the ramp and is acted upon by the force of gravity, such movement is resisted in greater or less degree by restricted hydraulic flow through or about the piston of the hydraulic device or through a restricted flow path extraneous to the piston itself.

This restricted hydraulic flow which controls the descent of each car or carrier after it has passed clear of the take-off ramp may be varied to control the descent of each car or carrier according to any desired pattern of acceleration and deceleration. For instance, the car or carrier may be permitted to fall relatively freely during the first part of its descent by reason of low hydraulic resistance to such movement, with the resistance of the hydraulic means increasing as the car or carrier approaches the low point, namely the flat portion of the circular ride pathway.

A single complete and representative embodiment of the principles of the present invention and a modification of the hydraulic means thereof are illustrated in the accompanying drawings and described in detail in the following specification. However, it is to be understood that such embodiments are set forth to illustrate the principles of the present invention and that the scope of the invention is not limited to such embodiments nor otherwise than as defined in the appended claims.

In the drawings:

Fig. 1 is a general top plan view of one form of the amusement ride of the present invention;

Fig. 2 is a general side elevational view thereof;

Fig. 3 is a fragmentary top plan view of the central portion of the ride, viewed as in Fig. 1 but on an enlarged scale;

Fig. 4 is an elevational view of the structure of Fig. 3;

Fig. 5 is a fragmentary top plan view of the outer portion of one of the arm structures and an associated passenger carrier, the same being in effect a continuation to the left of the structure of Fig. 3;

Fig. 6 is an elevational view of the structure of Fig. 5;

Fig. 7 is a somewhat schematic developed elevational view showing the ramp and jump portion of the ride;

Fig. 8 is a longitudinal cross-sectional view through one of the hydraulic piston and hydraulic mechanisms which are associated with each passenger car arm structure in the embodiment of Figs. 1 through 7;

Fig. 9 is a view similar to Fig. 8 showing a modified piston and cylinder arrangement; and

Fig. 10 is an end view of the hydraulic control rod for the piston and cylinder arrangement of Fig. 9.

Like characters of reference denote like parts throughout the several figures of the drawings and, referring particularly to Fig. 1, the ride comprises generally a rotatably mounted central structure designated generally by the numeral **10**, a plurality of arms radiating therefrom and designated generally by the numeral **11**, and a passenger carrier at the end of each arm and designated generally by the numeral **12**. In the present instance a circular plate or pathway is designated generally by the numeral **14** but the passenger carriers **12** may merely traverse the surface on which the ride generally is mounted, excepting for the ramp portion, if such surface be generally flat and level.

Referring more particularly to Figs. 3 and 4 and the aforesaid rotatable central structure which has previously been designated generally by the numeral **10**, a hub or sleeve **18** is mounted for free rotation about a fixed bearing or spindle designated **19** in Fig. 2 which is, in the present instance, fixed at an axis inclined somewhat to the vertical, for reasons which will presently appear.

Referring to Fig. 2, a drive sprocket **20** is fixed to hub **18** and a corresponding drive sprocket **21** is fixed to the output shaft of a reducing gear mechanism **22** which is in turn belt connected to a driving motor **23**.

Referring again to Figs. 3 and 4, in the form of the invention illustrated herein there are eight radiating arms **11** which are conveniently arranged in two staggered sets of four arms each to provide adequate pivot bearing support for connection of the arms with the central structure. To this end two square bearing support members, one above the other, are fixed to hub **18** and are designated **25** and **26**.

Each lateral edge of each of the structures **25** and **26** is provided with a pair of bearing formations **28**

which pivotally support a generally horizontal rock shaft member 32 which forms the inner end of each of the arms 11. In the present instance, each arm 11 comprises a main tubular radiating arm fixed to and extending outwardly from rock shaft 32 and designated 33. A pair of lateral bracing members for the arm member 33 are designated 35.

At their outer ends the members 33 and 35 of the arms 11 are fixed to the cars or passenger carrier devices 12, the latter being best shown in Figs. 5 and 6. Referring particularly to the car 12 at the right-hand side of Fig. 2, each car comprises a seat bottom 38 fixed to the top of the outer portions of the members 33 and 35 of the arms 11, a seat back 39, and a depending foot rest or floor member 40. At one side thereof floor member 40 includes a depending step member 41 to facilitate entering and leaving the passenger cars.

Referring particularly to Fig. 6, each car 12 is provided with a supporting ground wheel 45 which is mounted for free rotation at the outer end of an arm 46 which in turn is pivotally connected at its inner end to a block 47 as at 48, block 47 being fixed to the members 35 of arm structure 11.

A compression coil spring 50 and a hydraulic shock absorber 51 are mounted between the bottom of each car structure 12 and each arm 46, as clearly shown in Fig. 6, to cushion the seat structure on the ground wheel support. A rod 53 pivoted at its upper end to the car structure passes freely through the arm 46 and has a nut or the like at its lower end as at 55 to provide a play connection which limits separating movement between the wheel supporting arm 46 and the passenger car or carrier 12.

The previously described arrangement of the members 33 and 35 provides adequate horizontal bracing for each of the arms 11 and rigid bracing in a vertical plane is provided by the following readily collapsible or knockdown means, it being well known in this art that structure which may be readily disassembled for transportation and readily erected when desired is of great importance. As previously described, a block 47 is fixed to the members 35 and a bracing arm 60 connects between block 47 and an elevated point on the car structure 12 as clearly shown in Fig. 6, arm 60 being bolt connected at its opposite ends for ready disassembly.

The inner portion of each arm 11 is vertically and obliquely braced by a structure best illustrated in Figs. 3 and 4 and comprising a pair of oblique rods 61 which are bolted at their lower ends to outer portions of rock shaft 32 and converge upwardly to form a bifurcation 62 for pivotal connection with a yoke or clevis 63 formed at the inner end of a rod 64 which extends radially outwardly and downwardly to a bolted connection with the fixed block 47, as shown in Figs. 5 and 6. The bifurcated ends 62 of rods 61 are held in spaced relation by a block 65 which includes a lug 66. This bracing structure includes a further brace rod 67 which is bolted to the lug 66 at the converging portions of the rods 61 and to an intermediate portion of member 33 as illustrated in Fig. 4.

Thus the entire arm structure is securely braced and made rigid horizontally and vertically with each arm 11 being freely movable vertically about its mounting rock shaft 32. The manner in which such relative vertical pivotal movements of the arms 11 are effected and controlled will now be described.

The cars 12, upon power rotation of the central hub structure 18 as hereinbefore described, are moved about their circular path in an obvious manner and moved along a level surface until they reach a relatively fixed ramp structure designated generally by the numeral 70. This ramp structure comprises an incline 71 which is preferably curved upwardly to raise successive cars 12 vertically as their wheels 45 come to and traverse such incline and the ramps impart vertical acceleration to the cars.

At normal operating speeds the cars are projected into space as indicated generally by the circle A in Fig. 7 which represents the wheel of a car which has just left the incline 71. The ramp structure 70 further includes a drop portion 72 and cars which are operating at a slow speed as they pass the crest of the ramp structure will move downwardly along the drop portion 72, the wheel of such a car being designated B in Fig. 7.

As soon as a car at normal operating speed leaves the incline 71 of the ramp structure 70 as indicated by the wheel designated A, it comes under the control of hydraulic means which acts against the force of gravity to retard dropping movement of the car in accordance with a predetermined pattern of descent. In the present instance, such control means comprises, as to each of the cars 12, a hydraulic cylinder 80 which is pivoted at one end to the rotatable central hub structure 18 as at 81 and has a piston rod 82 projecting from the opposite end thereof for pivotal connection with the bracing structure of the associated arm 11 as at 83.

Referring to Fig. 8, the piston rod 82 has a piston 86 fixed thereto and piston 86 has a one-way check valve 87 therein which permits free fluid movement from the right-hand side of piston 86 to the left-hand side, as viewed in Fig. 8. Thus piston 86 moves to the right in cylinder 80 with virtually no hydraulic resistance and therefore upward pivotal movements of the arms 11 are relatively unimpeded and accordingly the cars move freely upwardly along the incline 71 of ramp 70 and upwardly therefrom to the full extent of the vertical acceleration and momentum imparted to the car 12 by the ramp.

However, fluid flow from left to right through piston 86 is by way of a restricted orifice 90 so that downward movement of an arm 11 and its associated car 12 is restrained or retarded to a predetermined rate depending on the size of the orifice 90 and such movement will be slowed to a desired rate consistent with safety of the passengers, a relatively gentle landing of the car on the level surface of the pathway, as indicated by the wheel designated C in Fig. 7, and a suitable extension of the time and distance of the flight path of the cars to promote the effect of a free jump or a free flight through the air of each successive car 12.

Figs. 9 and 10 show a modified hydraulic cylinder 95 having a piston 96 and piston rod 97, all of which is connected to the rotatable central structure 18 and the bracing structure of each arm 11 as heretofore described in the case of the embodiment of Fig. 8. Piston 96 has a check valve 98 as in the modification of Fig. 8 but the return movement of piston 96 is controlled by a rod 99 which is held between end wall 100 of cylinder 95 and the opposite end wall and extends slidably through an opening in piston 96.

Rod 99 has a tapered groove or keyway 101 formed at one or both sides thereof, the groove being deeper at the right-hand end than at the left-hand end as shown in the end view of rod 99, Fig. 10, to form a variable orifice. Restricted flow of hydraulic fluid from left to right in cylinder 95 through the piston 96 is primarily through the tapered groove or grooves and consequently fluid flow is more restricted when the piston 96 is in a left-hand position in cylinder 95 than when it is in a more right-hand position.

Thus descending movement of a car, beginning with the piston in the right-hand position as viewed in Fig. 9, encounters a lower resistance at the beginning of the descent and an increasing resistance as the piston moves to the left and the car approaches the ground. This progressively greater restraint counteracts the acceleration of the force of gravity on the car and also, if desired, permits a freer and faster descent of the car until it approaches the ground, at which time the hydraulic re-

sistance approaches a maximum and the impact of the car against the ground is reduced to a minimum.

Obviously, various descent patterns may be established by varying the area of the leakage orifice as established by the formation of the groove in the rod **99**, and other means may be provided for variably controlling leakage through or around the piston to establish any desired descent restraining pattern for the hydraulic means.

In the present disclosure the piston and cylinder devices are above the pivots of the arms **11** so that they collapse upon upward movement of the arms and extend upon downward movement. Obviously, the piston and cylinder connections might be arranged below the arm pivots or in such relationship that they expand upon upward movement of the arms and contract upon downward movement, in which case the valving of the piston and cylinder devices will obviously be reversed.

It will be noted that the spacing of the cars **12** is such that the entire ramp structure **70** fits within the space between adjacent cars, as shown in Fig. 1. Accordingly, when the ride is stopped all of the cars may rest at ground level whereby simultaneous loading and unloading of passengers to and from all of the cars is made possible without the use of steps, platforms or the like. This arrangement is highly advantageous in an amusement ride.

The inclination of the bearing or spindle **19** and consequently the hub **18**, which has been noted previously herein, divides the angular deviation of the arms **11** with respect to the axis of hub **18** between the high side and the low side of the ride as is believed to be obvious from an inspection of Fig. 2. This expedient is not novel to the present disclosure but is known to those skilled in the amusement ride art.

I claim:

1. In an amusement ride of the roundabout type, a generally upright central support and means rotatable relative thereto, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement of the arms relative to the rotatable means, passenger carrying means at the outer ends of said arms, power means for rotating said rotatable means whereby the passenger carrying means traverse a circular path, a ramp in said path having an inclined rise portion whereby the passenger carrying means ascend the ramp and are projected therefrom, hydraulic means having relatively movable parts connected to said arms and said rotatable means and adapted for relative movement in opposite directions in response to up and down movements of said arms, said hydraulic means being single-acting whereby said parts are movable unrestrictedly during upward movements of said arms but are restrained by restricted hydraulic flow upon downward movements of said arms and downward movement of said passenger carrying means occurs at a speed controlled by said hydraulic means.

2. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and connected thereto by generally horizontal pivots for up and down movement of the arms relative to the rotatable means, passenger carrying means at the outer ends of said arms, power means for rotating said rotatable means whereby the passenger carrying means traverse a circular path, a ramp in said path having an inclined rise portion terminating abruptly at the crest thereof whereby the passenger carrying means ascend the ramp and are projected therefrom, hydraulic means having relatively movable parts connected to said arms and said rotatable means and adapted for relative movement in opposite directions in response to up and down movements of said arms, said hydraulic means being single acting whereby said parts are movable unrestrictedly during upward movements of said arms but are restrained by restricted hydraulic flow upon downward movements of said arm and downward movement of said passenger carrying means occurs at a speed controlled by said hydraulic means.

3. In an amusement ride of the roundabout type, a generally upright central support and means rotatable relative thereto, a plurality of arms radiating from said rotatable means and connected thereto by generally horizontal pivots for up and down movement of the arms relative to the rotatable means, passenger carrying means at the outer ends of said arms, power means for rotating said rotatable means whereby the passenger carrying means traverse a circular path, a ramp in said path having an inclined rise portion terminating abruptly at the crest thereof whereby the passenger carrying means ascend the ramp and are projected therefrom, hydraulic means having relatively movable parts connected to said arms and said rotatable means and adapted for relative movement in opposite directions in response to up and down movements of said arms, said hydraulic means being single-acting whereby said parts are movable unrestrictedly during upward movements of said arms but are progressively restrained by increasingly restricted hydraulic flow upon downward movements of said arms and downward movement of said passenger means is decelerated by said hydraulic means as the passenger carrying means approaches ground level.

4. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement, each arm including passenger carrying means at the outer end thereof, means for rotating said passenger-carrying means, a ramp in the path of said passenger carrying means whereby the passenger carrying means ascend the ramp and are projected therefrom, a single-acting extensible and contractible hydraulic shock absorber connecting between points on each arm and said rotatable support offset with respect to said arm pivot, whereby said passenger carrying means move freely upwardly but are lowered at a controlled rate by said hydraulic shock absorbers.

5. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement, each arm including passenger carrying means at the outer end thereof, means for rotating said passenger-carrying means, a ramp in the path of said passenger carrying means whereby the passenger carrying means ascend the ramp and are projected therefrom, hydraulic means connecting between points on each arm and said rotatable support offset with respect to said arm pivot, said hydraulic means being freely yieldable in one direction but offering restricted fluid flow resistance in the other direction, whereby said passenger carrying means move freely upwardly but are lowered at a controlled rate by said hydraulic means.

6. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement, passenger carrying means at the outer ends of said arms, means for rotating said passenger-carrying means, a ramp in the path of said passenger carrying means whereby the passenger carrying means ascend the ramp and are projected therefrom, fluid pressure means connecting between points on each arm and said rotatable support, said fluid pressure means being freely yieldable in one direction but offering restricted fluid flow resistance in the other direction, whereby said passenger means move freely upwardly but are lowered at a controlled rate by said fluid pressure means.

7. In an amusement ride of the roundabout type, a generally upright central support and means rotatable

relative thereto, a plurality of arms radiating from said rotatable means and connected thereto for up and down movement of the arms relative to the rotatable means, passenger carrying means at the outer ends of said arms, power means for rotating said rotatable means whereby the passenger carrying means traverse a circular path, a ramp in said path having an inclined rise portion terminating abruptly at the crest thereof whereby the passenger carrying means ascend the ramp and are projected therefrom, fluid pressure means having relatively movable parts connected for relative movement in opposite directions in response to up and down movements of said arms, said fluid pressure means being single-acting whereby said parts are movable unrestrictedly during upward movements of said arms but are restrained by restricted fluid flow upon downward movements of said arms and downward movement of said passenger carrying means occurs at a speed controlled by said fluid pressure means.

8. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and connected for up and down movement, passenger carrying means at the outer ends of said arms and ground wheels supporting the same, means for rotating said passenger carrying means about said support, a ramp in the path of said passenger means having an inclined rise portion whereby the ground wheels ascend the ramp and the passenger carrying means are projected therebeyond, hydraulic means having relatively movable parts connected for relative movement in opposite directions in response to up and down movements of said arms, said hydraulic means being single-acting whereby said parts are movable relatively unrestrictedly during upward movements of said arms but are restrained by restricted hydraulic flow upon downward movements of said arms and downward movement of said passenger carrying means occurs at a speed controlled by said hydraulic means.

9. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement, passenger carrying means at the outer ends of said arms and ground wheels supporting the same, means for rotating said passenger carrying means about said support, a ramp in the path of said passenger carrying means having an inclined rise portion whereby the ground wheels ascend the ramp and the passenger carrying means are projected therebeyond, fluid pressure means having relatively movable parts connected to said arms and said rotatable means and adapted for relative movement in opposite directions in response to up and down movements of said arms, said fluid pressure means being single-acting whereby said parts are movable

relatively unrestrictedly during upward movements of said arms but are restrained by restricted fluid pressure flow upon downward movements of said arms and downward movement of said passenger carrying means occurs at a speed controlled by said fluid pressure means.

10. In an amusement ride of the roundabout type, a central support and means rotatable relative thereto in a generally horizontal plane, a plurality of arms radiating from said rotatable means and pivoted thereto for up and down movement, passenger carrying means at the outer ends of said arms and ground wheels supporting the same, means for rotating said passenger carrying means about said support, a ramp in the path of said passenger carrying means having an inclined rise portion whereby the ground wheels ascend the ramp and the passenger carrying means are projected therebeyond, hydraulic means having relatively movable parts connected to said arms and said rotatable means and adapted for relative movement in opposite directions in response to up and down movements of said arms, said hydraulic means being single-acting whereby said parts are movable relatively unrestrictedly during upward movements of said arms but are progressively restrained by increasingly restricted hydraulic flow upon downward movements of said arms and downward movement of said passenger carrying means is decelerated by said hydraulic means as the passenger carrying means approaches ground level.

11. In an amusement ride of the roundabout type, a generally circular pathway, a plurality of radiating arms and passenger carriers at the outer ends of said arms, means for rotating said arms to cause said carriers to traverse said circular pathway, said circular pathway being substntially level throughout a major portion of its extent and having an ascending takeoff ramp portion adapted to raise the carriers successively as they traverse said circular pathway to project into space therefrom, dashpot means movable in response to vertical movement of said carriers, said dashpot means being single-acting and thus permitting relatively free upward movement of said carriers but exerting a yieldable time-delay resistance to downward movement thereof, whereby upon leaving the ramp the otherwise unsupported carriers are arranged to descend at a predetermined downward rate under the control of said dashpot means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,583,287	Fisher	May 4, 1926
2,239,542	Stanzel	Apr. 22, 1941
2,638,345	Norvell	May 12, 1953
2,659,601	Siuerts	Nov. 17, 1953

FOREIGN PATENTS

405,422	Great Britain	Feb. 8, 1934