

March 27, 1951

G. W. BERGEN
VERTICAL AXIS ROUNDABOUT

2,546,917

Filed Feb. 20, 1948

3 Sheets—Sheet 1

Fig. 1

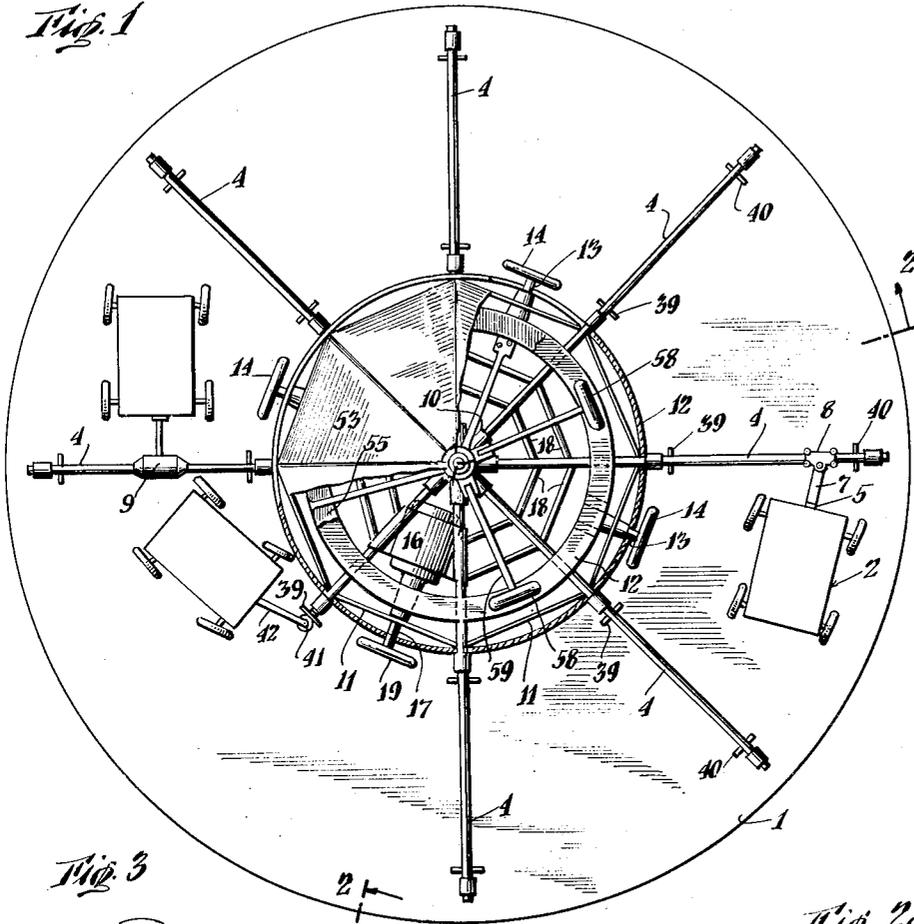


Fig. 3

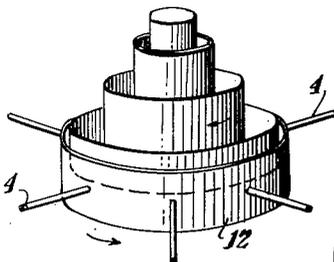


Fig. 2

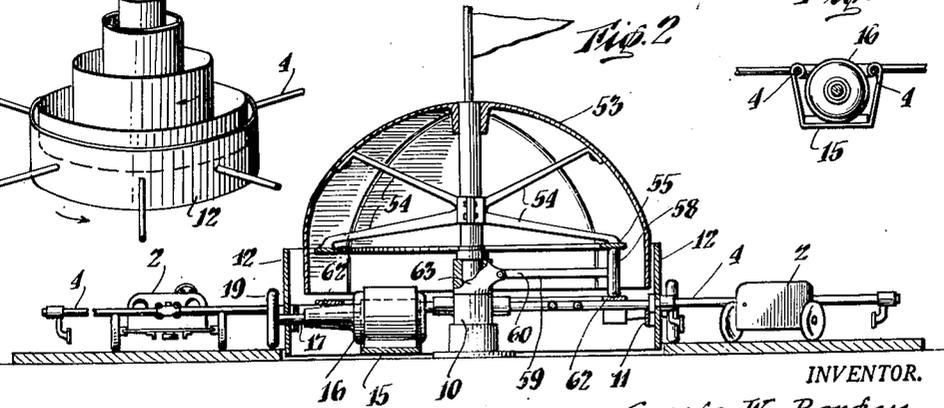
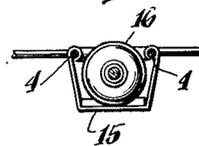


Fig. 2a



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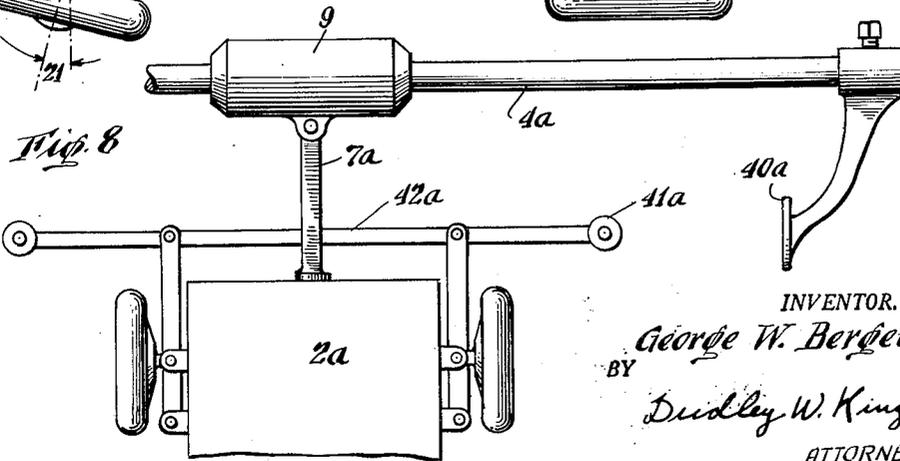
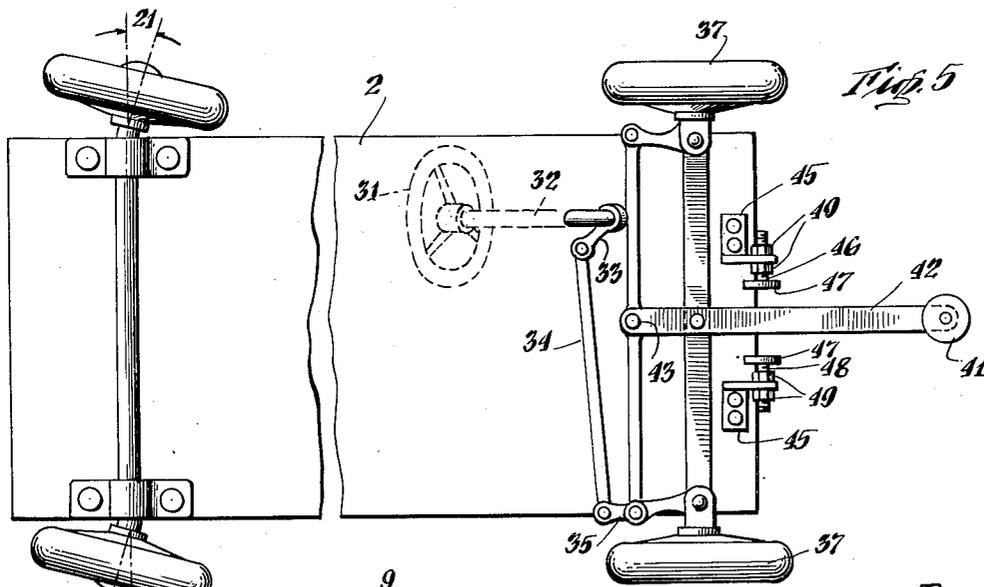
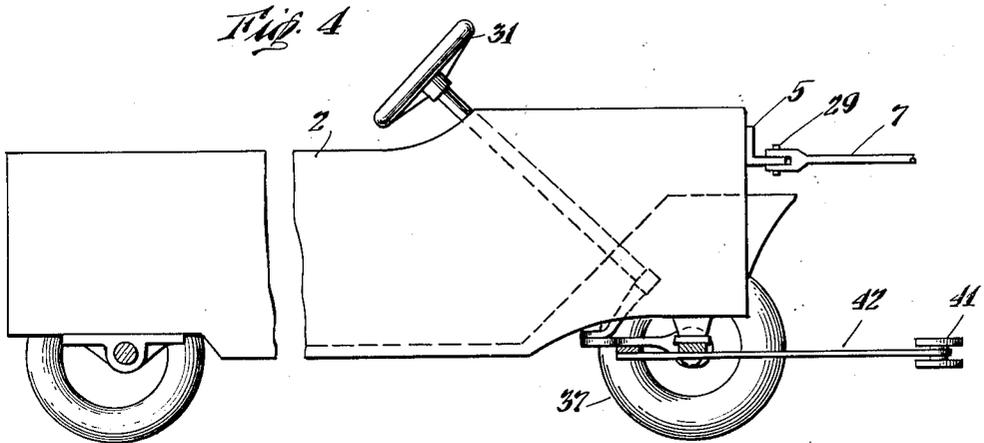
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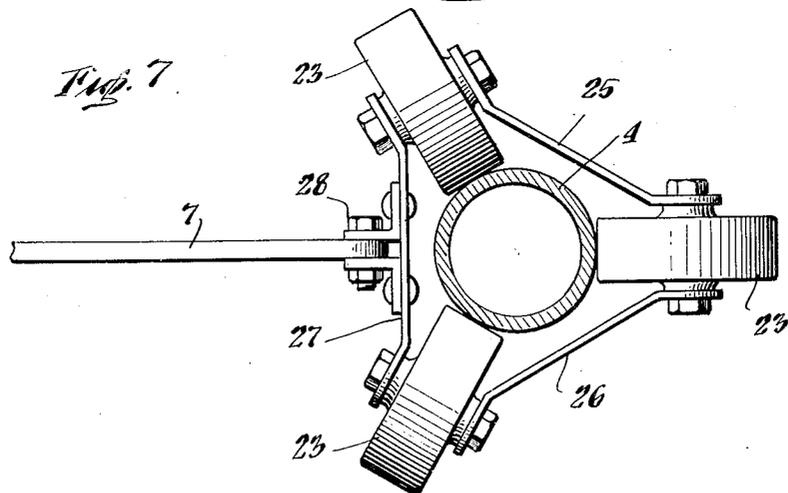
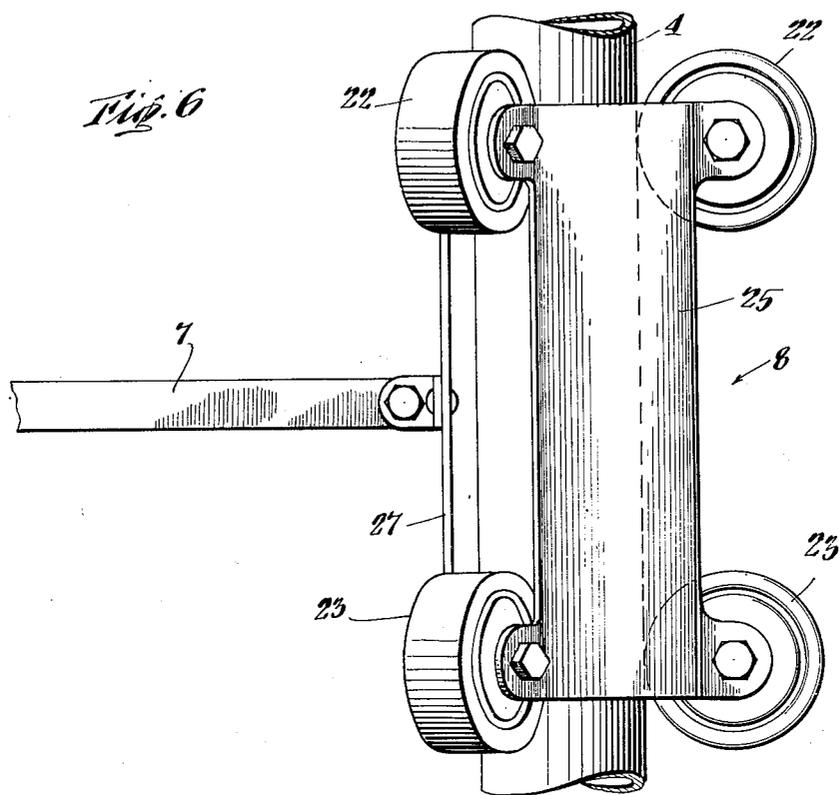
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VERTICAL AXIS ROUNDABOUT

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9 Claims. (Cl. 272—43)

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The present invention relates generally to amusement or instruction apparatus and more particularly to such apparatus of the "roundabout" type.

Designers of amusement or instruction devices and operators of amusement parks are continually endeavoring to achieve an apparatus or device which, while actually restricted to operation within safe conditions or limits, yet affords a maximum amount of control by an operator and appears to be under almost complete control of the operator of the apparatus or device. The operator should be, to a maximum extent, under the illusion that he is able to freely and readily effect control or movement of the apparatus or device; this feature is particularly desirable with amusement devices adapted to be ridden by young children.

Numerous attempts have been made to produce such a roundabout type of apparatus or device but most of them embodied objections of one sort or another which prevented their going into commercial use, or they proved to be too complicated and expensive to construct and operate.

The present invention aims to overcome the above and other difficulties or disadvantages by providing a new and improved amusement or instruction apparatus which is safe in operation and which gives an operator or customer maximum control of a vehicle or car while at the same time maintaining the vehicle or car within safe limits of operation.

An object of the present invention is to provide a new and improved instruction or amusement apparatus.

Another object of the invention is to provide a new and improved instruction or amusement apparatus of the roundabout type.

Another object of the invention is to provide an instruction or amusement device which provides an operator with a relatively great amount of control of a particular portion of the apparatus.

Another object of the invention is to provide an instruction or amusement device embodying improved safety means for maintaining the apparatus within safe limits of operation.

Another object of the invention is to provide a vehicle or car, adapted to be used with a roundabout type of amusement device, embodying means for minimizing wear of supporting wheels or tires.

Another object of the invention is to provide a vehicle or car, adapted to be used with a roundabout amusement device, which is more readily steerable or controllable by an operator.

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A still further object of the invention is to provide a roundabout type of instruction or amusement apparatus adapted to furnish an illusion of greater speed to the operator of a vehicle or car associated therewith.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

Fig. 1 is a top plan view illustrating in a general way a preferred embodiment of the invention;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1;

Fig. 2a is a fragmentary sectional view showing a detail of the driving means illustrated in Figs. 1 and 2;

Fig. 3 is a perspective view illustrating a modified form of a portion of the device shown in Figs. 1 and 2;

Fig. 4 is a side elevational view showing one form of vehicle or car;

Fig. 5 is a bottom plan view of the vehicle or car illustrated in Fig. 4;

Fig. 6 is a plan view illustrating one form of vehicle connecting means;

Fig. 7 is an end view of the vehicle connection means shown in Fig. 6; and

Fig. 8 is a plan view illustrating a modified form of vehicle controlling means.

Referring more particularly to Figs. 1 and 2 of the drawings, there is shown a platform or base 1 upon which are supported a plurality of vehicles or cars 2. Each of the vehicles or cars 2 is operatively connected with a substantially radially extending arm or tow bar 4 by attachment or angle members 5, connecting links 7 and roller or travelling assemblies 8.

While eight substantially radially extending tow bars 4 are shown for illustrative purposes, each adapted to be operatively connected with a vehicle 2, any other suitable number may be utilized. The exact number to be utilized may be affected by the lengths of the tow bars and the sizes of the vehicles to be operatively connected therewith.

The radial tow bars 4 are shown joined, in any

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suitable manner, at their inwardly disposed ends with a retaining means or hub 10. The hub 10 is adapted to be rotated, with the tow bars 4, about a central axis or shaft. Each of the tow bars 4 may be maintained in spaced relationship at points located outwardly from the hub 10 by any suitable interconnecting strengthening or retaining members 11 and 18 and the strengthening or retaining members 11 with the tow bars 4 are shown supported upon the axles 13 of wheels 14 positioned at suitable intervals around the circumference formed by the retaining members 11. The foregoing construction maintains the radially extending arms 4 in correctly disposed spaced relationship and in elevated position above the platform 1.

Preferable a suitable shield or cover means 12 is utilized to conceal the centrally disposed portions of the device in order to enhance its general appearance.

Simultaneous rotation of the tow bars 4, together with the vehicles or cars 2 connected therewith, is shown provided by an electric motor 15, mounted on a lowered platform 15 rotatable with the radial arms 4, through the shaft 17 of the motor which is operatively connected with a driving wheel 19 that rests upon the platform 1. The motor platform 15 may be supported on the arms 4 in any suitable manner, for example by side walls or bracket-like portions that fit around the arms 4 as shown in Figs. 1 and 2a. When the motor 16 is actuated it turns the wheel 19 through the shaft 17 and the traction provided by the wheel 19 against the upper surface of the platform 1 serves to drive or rotate the tow bars 4 and connected vehicles 2 over the surface of the platform 1. The driving force or motivating effect of the wheel 19 is conveyed to the rotatable structure through the shaft 17 and a supporting or structural member 11, through which the shaft extends. Thus, actuation of the motor 16 serves to move the cars 2 around the platform. While any other suitable means may be provided for rotating the arms or bars 4 and vehicles 2, the above described means has proven satisfactory in actual operation.

Each of the vehicles 2 is adapted to be occupied by one, two, four or any other suitable number of operators or customers, depending upon the size of the vehicles and the number of seats provided in the vehicles, and it is desirable that means be provided for facilitating movement of the vehicle longitudinally of the radially extending tow bar or arm 4 by the operator. As pointed out hereinabove, each of the vehicles is preferably connected with a tow bar by a bracket 5, connecting members 7 and traveling assembly 8.

Each of the traveling assemblies or devices 8 preferably comprises a plurality of spaced rollers 22 and 23 (Fig. 6) normally in contact with the radially extending tow bars 4, the spaced rollers 22 and 23 being maintained in desired position by interconnecting retaining plates 25, 26 and 27. As shown in Figs. 6 and 7, each of the plates 27 is joined with the connecting rod 7 by a pivotal connection 28. A metal cover 9 (Figs. 1 and 8) of any suitable type preferably encloses the rollers 22, 23 and their interconnecting plates to improve the appearance.

The opposite end of the connecting member 7 is preferably joined with the bracket 5 by a pivotal connection 29 (Fig. 4). The construction provides for ready movement of the traveling means or device 8 longitudinally of an arm or tow bar and facilitates guiding or direction by

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an operator of a vehicle 2 outwardly or inwardly along the tow bar 4.

Guiding or direction of a vehicle 2 longitudinally of a bar 4 may be provided by a suitable steering mechanism (Figs. 4 and 5) comprising a steering wheel 31, steering shaft 32, and link members 33, 34 and 35. Turning the steering wheel 31, or any other lever or levers which might be connected with the shaft 32 in lieu of a wheel, is effective to turn the front wheels 37 of a vehicle 2 toward the right or left similar to an automobile in such manner as to provide guiding or steering of the vehicle longitudinally of a radially extending tow bar 4. The vehicle illustrated in the drawings is a general representation of a "jeep" but it could be made to represent some other vehicle, for example an aeroplane, in which event foot operated levers or wheel spoke arms could be positioned near the floor of the vehicle. In some instances it may be desired to provide a duplicate or dual steering wheel in a vehicle and such may be similar to the foregoing described construction.

An operator seated in a particular vehicle may steer a vehicle in and out along an arm or tow bar 4 simultaneously with rotation of the bars 4 about a circular path under the influence of the driving motor 16 and driving wheel 19.

It is desirable that the extent of inward and outward movement of each vehicle along a radial bar 4 be limited. This is shown provided by stop plates 39 and 40 adapted to be contacted by a roller 41 carried adjacent the outer end of a safety steering bar 42 of each vehicle (Figs. 1, 4, 5), the safety steering bar being operatively connected with the steering mechanism adjacent its opposite end 43. The safety steering bar 42 turns in accordance with motion imparted to the steering wheel 31. When a vehicle approaches the limit of its outward movement along a tow bar 4 the roller 41 comes into contact with a stop plate 40 and the stop plate serves to press the outward end of the safety steering bar 42 inwardly and thus direct the vehicle inwardly along the tow bar 4. When a vehicle approaches the limiting extent of its inward movement the roller 41 comes into contact with an inwardly disposed stop plate 39 and this latter stop plate serves to urge the end of the safety steering bar 42 in outward direction to thus steer or direct the vehicle outwardly along the tow bar. The operator may guide a vehicle along the tow bar 4 for the full extent thereof intermediate the inner and outer stop plates 39 and 40.

It is desirable to provide means for limiting the angle or extent through which the front wheels 37 of a vehicle may be turned in order to minimize the possibility of an operator turning the wheels inwardly or outwardly to such an extent as to cause them to drag sideways along the platform 1. Means for so limiting the extent through which the wheels may be turned is shown more particularly in Fig. 5 wherein angle members 45 secured to the underside of a vehicle are provided with adjustable stop screws 46. The stop screws 46 may have their positions selectively determined so that end plates 47 thereon are positioned at desirable distances from the safety steering bar 42 that extends outwardly between them.

When the adjustable stop members 46 are moved apart from each other, the safety steering bar has a relatively wide range of movement and the steering wheel 31 and front vehicle wheels may be turned through a relatively large angle;

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a vehicle may thus be steered rapidly in and out along a tow bar 4. When the adjustable stop screws are moved inwardly toward each other the extent of movement of the safety tow bar is more limited and hence the operator may turn the steering wheel and front wheels 37 through a lesser angle and thus the vehicle will move inwardly and outwardly along a tow bar at a slower rate. Lock nuts 49 may be provided for securing the adjustable stop screws in a particular adjusted position.

In Fig. 8 there is shown a modified form of safety steering bar adapted to perform the function of the steering bar illustrated in Figs. 4 and 5. As shown in Fig. 8 the safety steering bar comprises a member 42a extending substantially transversely across the front of the vehicle 2a and having rollers 41a secured adjacent the outwardly extending ends thereof. As the vehicle 2a is steered in and out along the tow bar 4a the rollers 41a come into contact with stop plates similar to those described in connection with Figs. 4 and 5 and the extent of inward or outward movement of the vehicle 2a along the tow bar 4a is limited.

It will be noted (Figs. 1, 2 and 5) that the rear wheels of the vehicles 2 are shown fixed at outwardly divergent angles 21 (Fig. 5) with respect to the normal path of movement of a vehicle 2. The rear wheels are preferably permanently set at an outwardly disposed angle with respect to the fore and aft axis of a vehicle. It has been found that setting the rear wheels outwardly at a permanent angle facilitates travel of a vehicle around the circular platform 1 and greatly minimizes wearing of the tires which support the rear of a vehicle.

The particular mounting angle for the rear wheels of a given installation will be influenced by the effective lengths of the tow bars 4 and the distances along the tow bars through which the vehicles may be driven. In actual practice it is desirable to utilize an angle setting which gives optimum vehicle travel and minimum tire wear at a location substantially midway between the inner and outer stop plates 39 and 40; as vehicles move in or out with respect to such an "average" location there is minimum deviation in vehicle operating and tire wearing characteristics. By way of example, in one installation utilizing tow bars approximately twelve and one-half feet long, with approximately six feet between inner and outer stop plates, rear wheel angle settings 21 of about nine degrees have been found satisfactory.

In order to promote an illusion of speed there is preferably provided a dome-like portion 53 mounted on suitable supporting arms 54 and disposed adjacent the inward portions of the tow bar 4. Certain of the supporting arms 54 are secured to a circumferentially extending track 55 that rests upon the upper side of spaced supporting wheels 58 rotatably carried by retaining arms 59 secured adjacent their inner ends 60 with a hub or bearing portion 63; this hub 63 may be secured to the central shaft, by set screws or in any suitable manner, so as to hold the arms 59 stationary. The spaced wheels 58 are shown resting against a circumferentially extending trackway or path 62 secured to the upper surfaces of the tow bars 4, about which they travel. As the motor 16 serves to rotate the tow bars 4 and trackway 62, the connecting members 59 and supplemental wheels 58 tend to remain at rest; however, the wheels 58 are caused to rotate by

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movement of the trackway 62. This rotation of the tow bar 4 and lower trackway 62 and wheels 58 tends to rotate the upper trackway 55 in a direction opposite to that of the rotation of the trackway 62. Thus the dome-like member 53 carried by the supporting members 54 tends to rotate about the central shaft in an opposite direction with respect to movement with the tow bars 4 and vehicles 2. As a result the relative movement causes the vehicles 2 to appear to be moving faster than their actual speed or movement over the platform 1.

While the member 53 is shown of substantially dome-like shape in Fig. 2 any other appropriate shape could be utilized, for example, the tiered cylindrical construction shown in Fig. 3.

It will be seen that the present invention provides a new and improved instruction or amusement apparatus which is adapted to provide an operator with a greater degree of control or freedom of movement of a vehicle than is generally true of previous constructions. The operator may readily and easily control the steering of a vehicle in and out along a radially extending tow bar. Since a vehicle is pulled by a tow bar at a position (link 7) spaced from the steering mechanism, the operation of the steering mechanism is not hindered or impaired in any way but may be turned relatively easily by the operator. While a vehicle may be readily steered in and out longitudinally of a tow bar, excessive or rapid movement of a vehicle along the tow bar may be minimized or prevented by the provision of adjustable control screws. Excessive movement of a vehicle inwardly and outwardly of a tow bar is prevented or minimized by the safety steering bar adapted to co-operate with inwardly or outwardly disposed stop plates carried by the steering bar.

Excessive wear of the tires of a vehicle and improved travel of a vehicle around a supporting platform is provided by positioning the non-steerable vehicle supporting wheels at a fixed outwardly disposed angle with respect to the normal path of movement of the vehicles.

The provision of an interiorly disposed oppositely revolving dome-like member provides the illusion of greater than actual speed of the vehicles.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In an amusement device of the class described, the combination of a plurality of substantially radially extending arms adapted to move about a circular path, means for supporting said arm and moving it about said path, steerable vehicles operatively connected with and propelled by said arms adapted to travel about said circular path and steerable lengthwise of said arms during movement about said circular path, a movable wall portion supported on said vehicle propelling arms adjacent inner portions thereof, and drive means operatively interposed between said movable arms and said wall portion for moving said wall portion relative to said arms.

2. In an amusement device of the class described, the combination of a plurality of substantially radially extending arms adapted to move about a circular path, means for support-

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ing said arms and moving them about said path, vehicles operatively connected with said arms adapted to travel about said circular path and to move lengthwise of said arms, a first wall portion carried by said arms adjacent inner portions thereof, and movable with said arms about said circular path, a second wall portion carried by said arms and spaced from said first wall portion, and means operatively interconnecting said arms and said second wall portion for moving said second wall portion in a direction opposite to that of said arms and said first wall portion.

3. In an amusement device of the class described, the combination of a plurality of substantially radially extending arms adapted to rotate about a circular path, means for supporting said arms and rotating them about said path, vehicles operatively connected with said arms adapted to travel about said circular path and to move lengthwise of said arms, a movable wall portion supported upon and projecting above said arms adjacent centrally disposed portions thereof, and driving means interconnecting said movable wall portion and said arms for rotating said wall portion in a direction opposite to that of said arms upon rotation of the arms.

4. In an amusement device of the class described, the combination of a plurality of substantially radially extending arms adapted to revolve about a circular path, means for supporting said arms and revolving them about said path, vehicles operatively connected with said arms adapted to travel about said circular path and to move longitudinally of said arms, a circular trackway mounted on said arms adjacent inwardly disposed portions thereof, a rotatable wheel resting against said trackway and revoluble with said arms upon rotation thereof with said trackway, and a revoluble wall supported upon said wheel and adapted to revolve in a direction opposite to that of said arms upon rotation thereof with said trackway.

5. A device of the class described comprising the combination of rotatable means, an arm projecting from said means and rotatable therewith, a vehicle having a steerable supporting wheel, means for manually steering said wheel from the vehicle to direct the vehicle longitudinally of the arm, means interconnecting said vehicle and arm independently of said steerable wheel for rotation of the vehicle with the arm upon rotation of the latter, a member independent of said interconnecting means operatively connected with said

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steerable wheel for turning movement with said wheel during steering thereof, and stop means adjacent outer and inner portions of said arm adapted to be contacted by a portion of the member to move it and turn said wheel in a direction away from the stop means.

6. A device of the class described comprising the combination of rotatable means, a plurality of arms projecting generally radially from said means at spaced intervals thereabout and rotatable therewith, a plurality of vehicles each having a steerable supporting wheel, means for manually steering said wheel from the vehicle to direct the vehicle longitudinally of the arm, means interconnecting each of said vehicles and arms independently of said steerable wheel for rotation of the vehicles with the arms upon rotation of the latter, each vehicle having a member independent of said interconnecting means operatively connected with said steerable wheel for turning movement with said wheel during steering thereof, and stop means adjacent outer and inner portions of each of said arms adapted to be contacted by a portion of the member to move it and turn said wheel in a direction away from the stop means.

7. A device as claimed in claim 5, in which selectively settable means is provided adjacent oppositely disposed portions of said member for controlling the angle through which said member and said steerable wheel may be turned.

8. A device as claimed in claim 5, in which said arm carries the stop means.

9. A device as claimed in claim 5, in which said vehicle also has a pair of supporting wheels permanently fixed to the vehicle at an angle such as to direct a portion of the vehicle toward the outer portion of the arm.

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