Oct. 27, 1931. W. F. DREW ET AL 1,829,266

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Fig. 1.

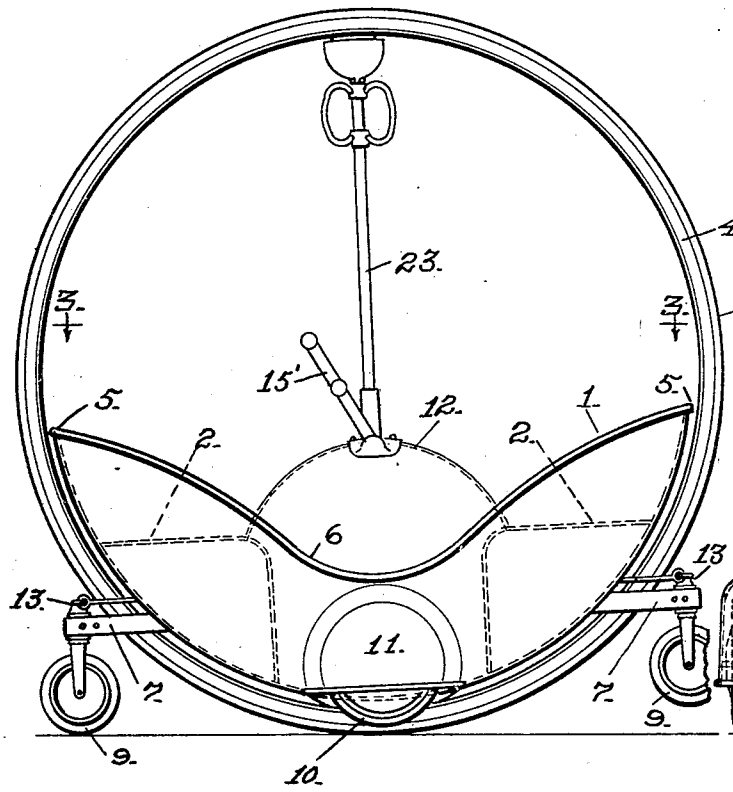
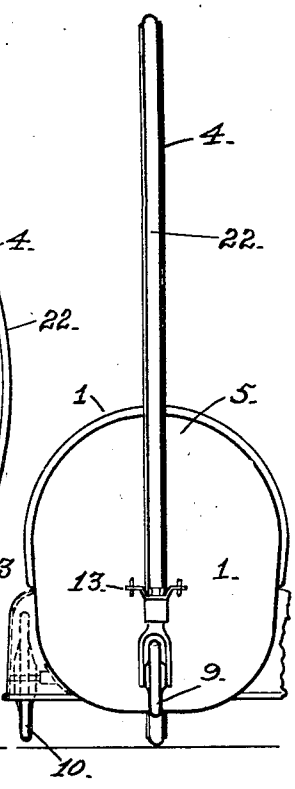


Fig. 2.



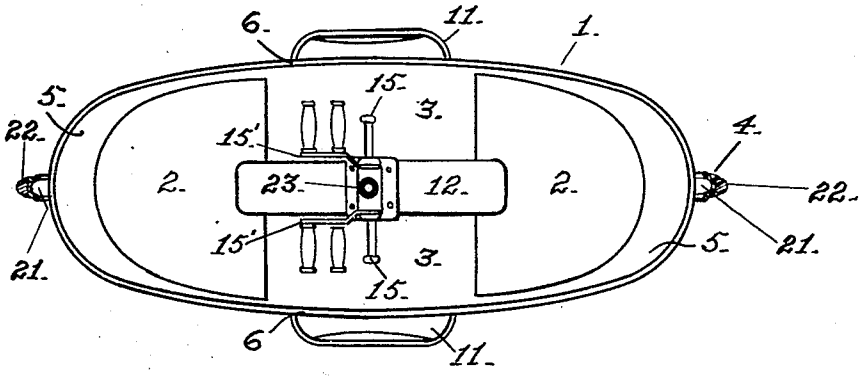


Fig. 3.

INVENTORS

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Fig-4

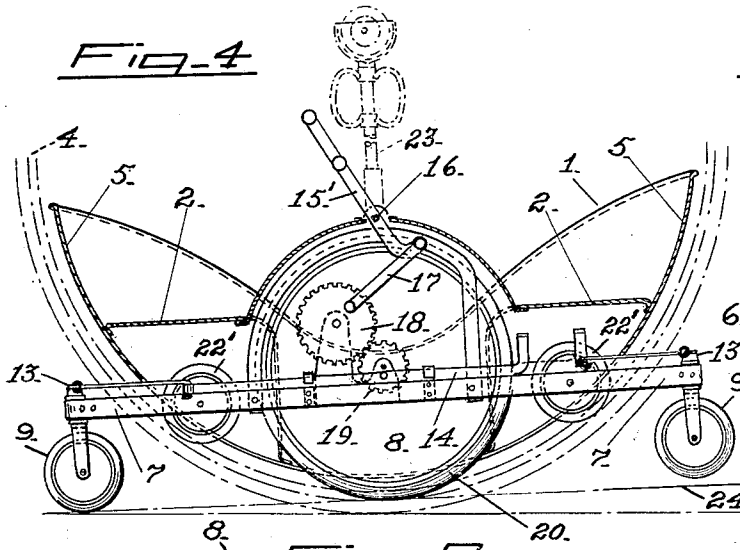


Fig-5

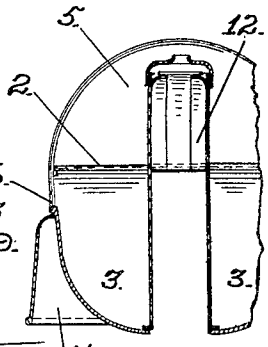


Fig-6

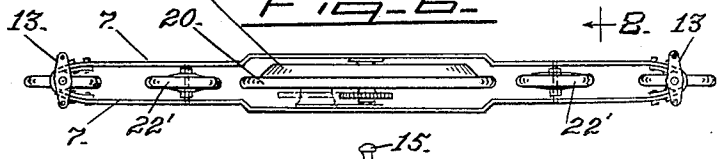
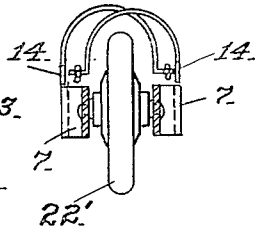


Fig-8



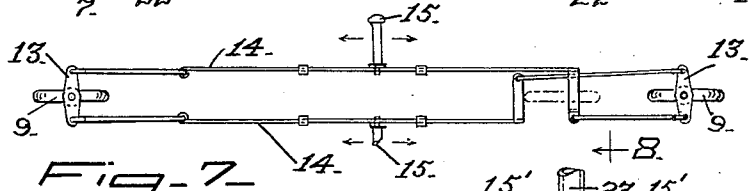


Fig-7

Fig-9

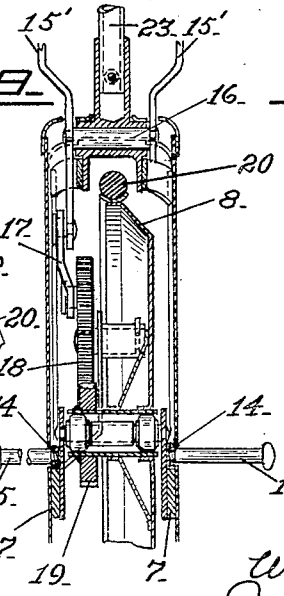
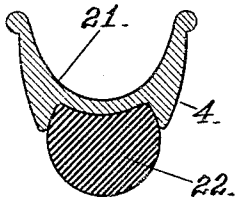


Fig-11



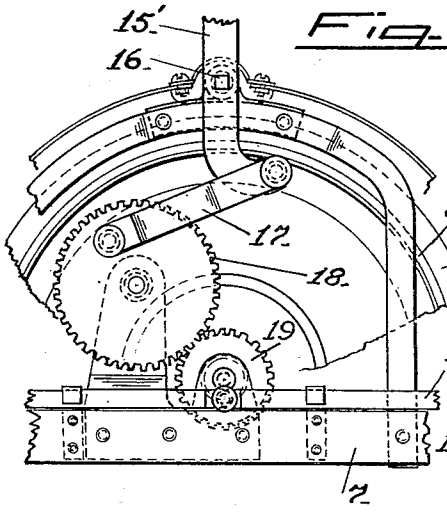


Fig-10

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Fig. 12

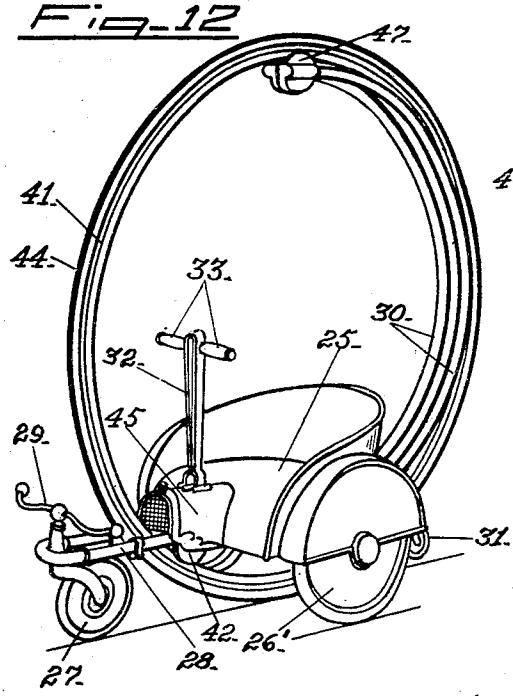


Fig. 13

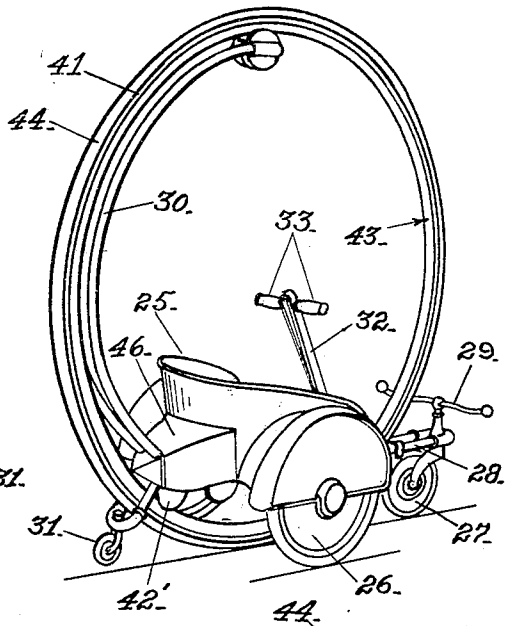


Fig. 14

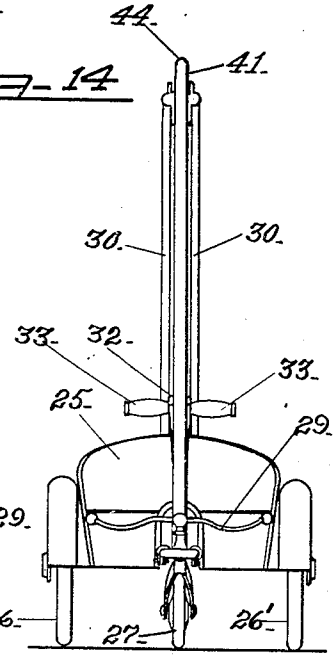
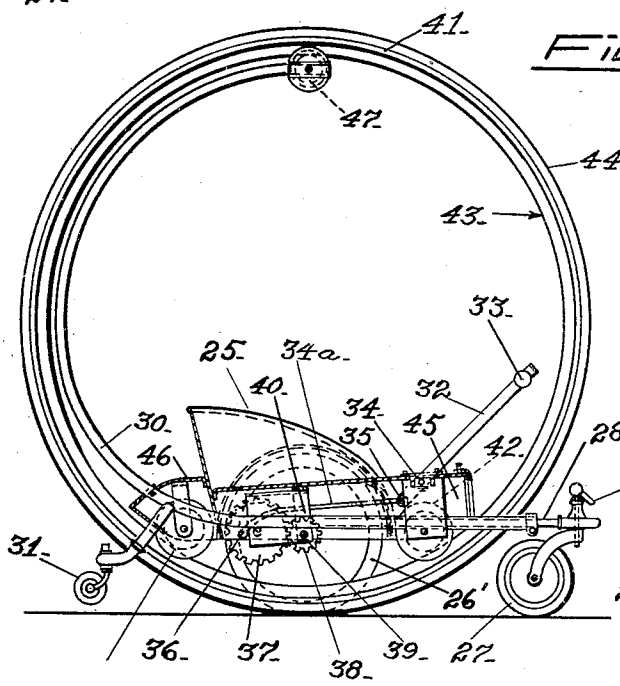


Fig. 15



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Fig. 16.

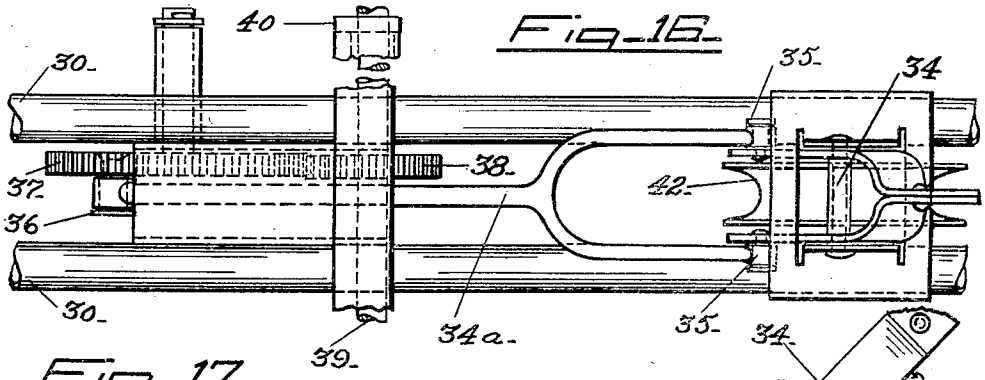


Fig. 17.

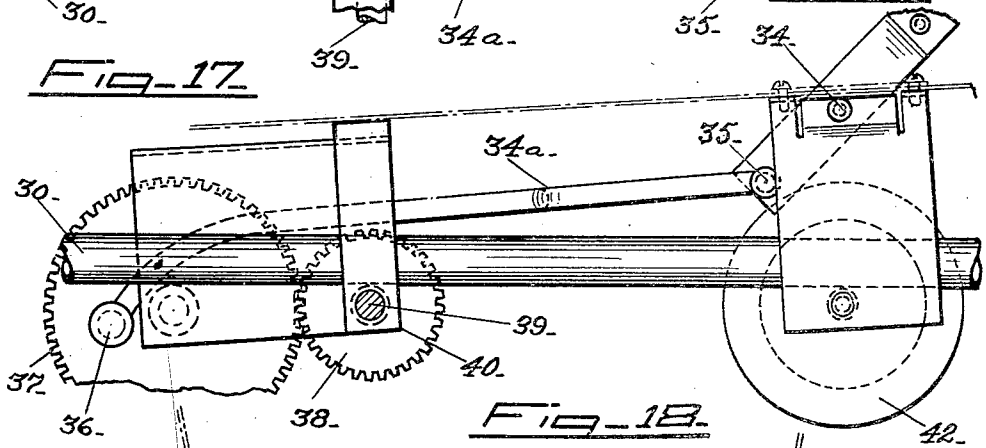


Fig. 18.

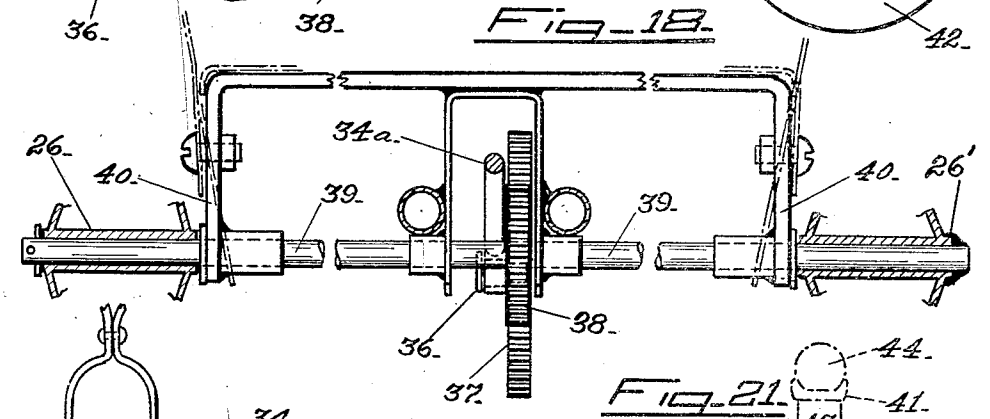
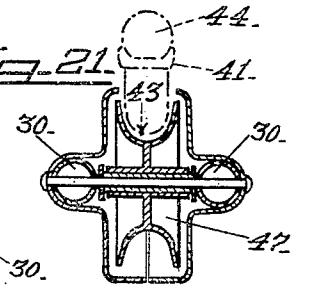


Fig. 21.



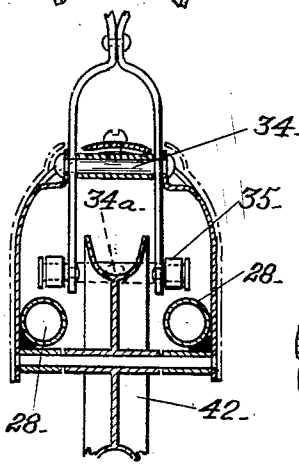


Fig. 19.

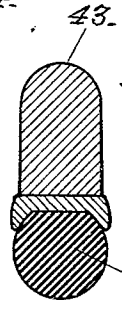


Fig. 22.

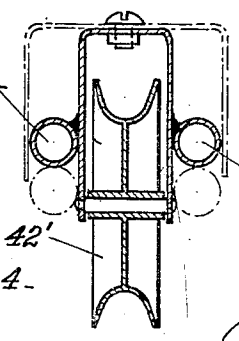


Fig. 20.

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Fig. 23.

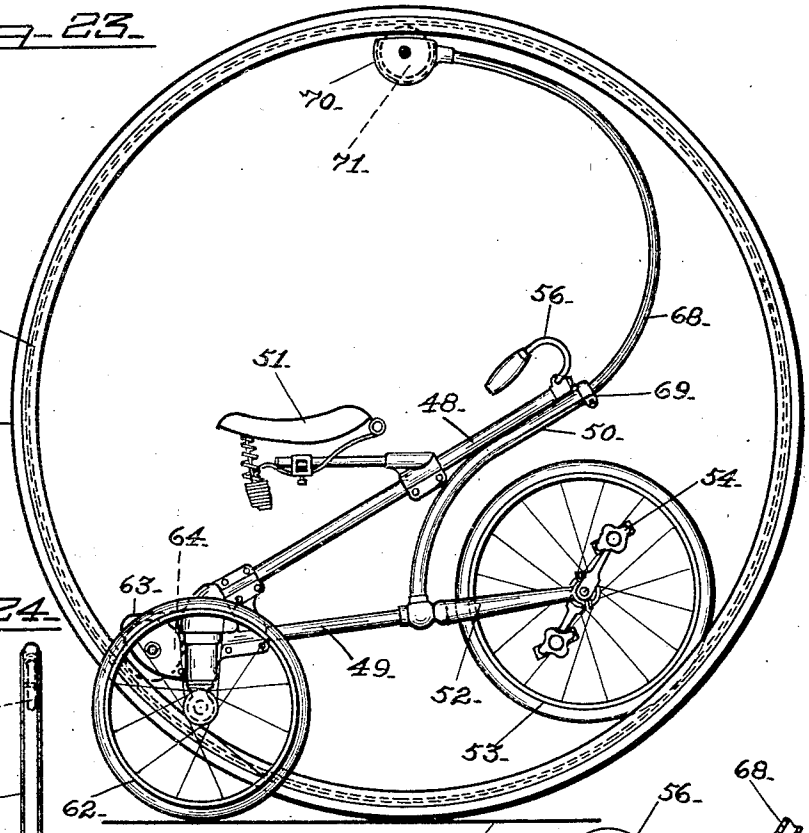


Fig. 24.

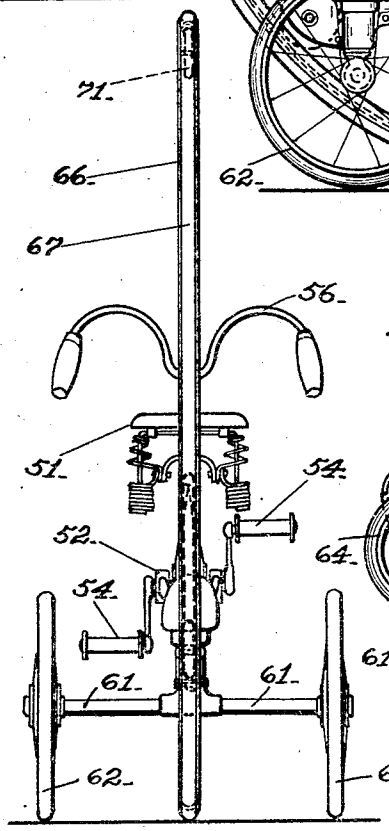


Fig. 25.

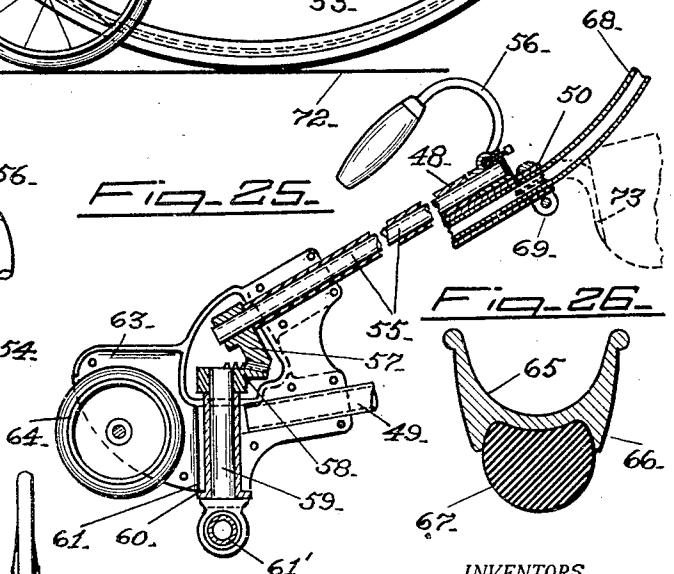


Fig. 26.

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Fig. 27.

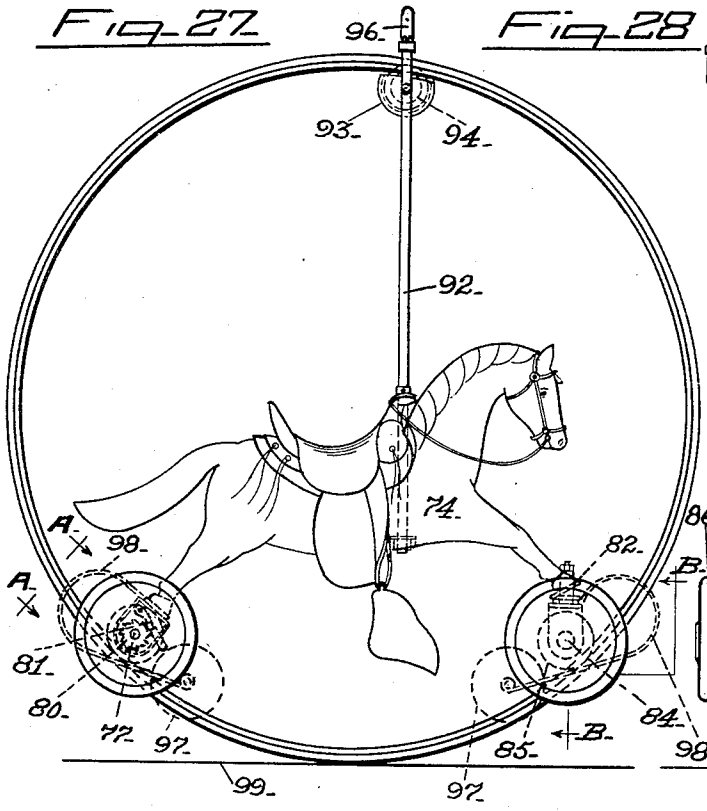


Fig. 28.

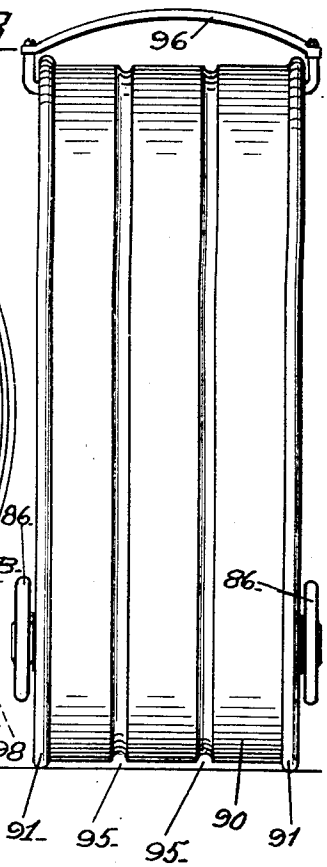
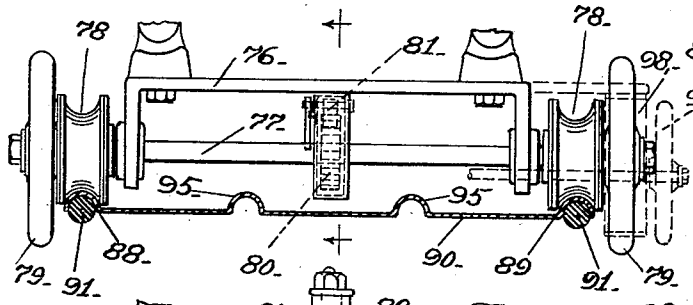


Fig. 29.



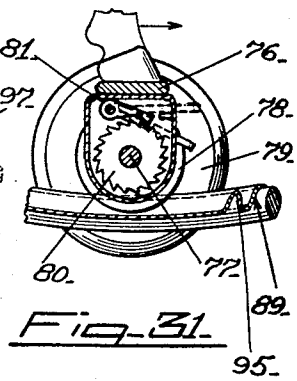


Fig. 31.

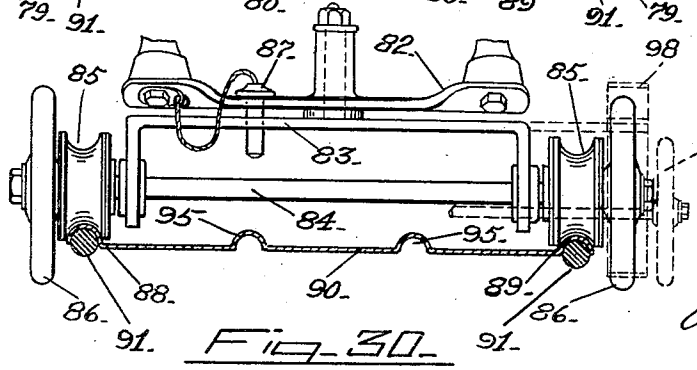


Fig. 30.

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Fig. 32.

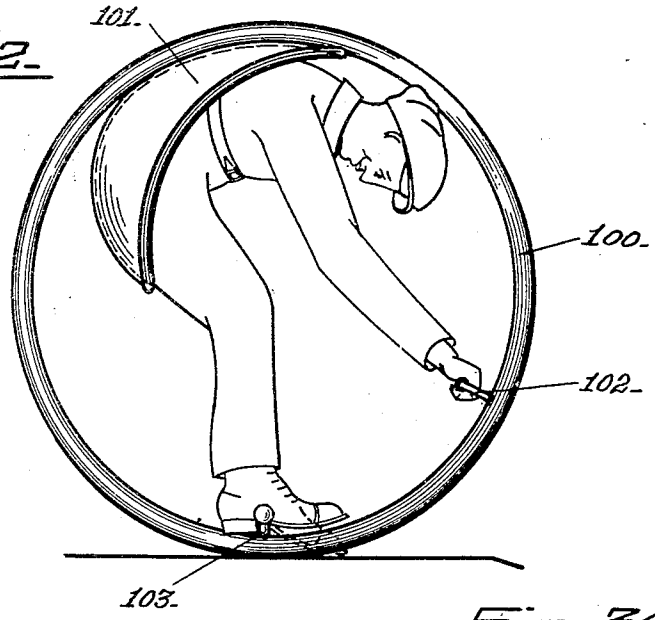
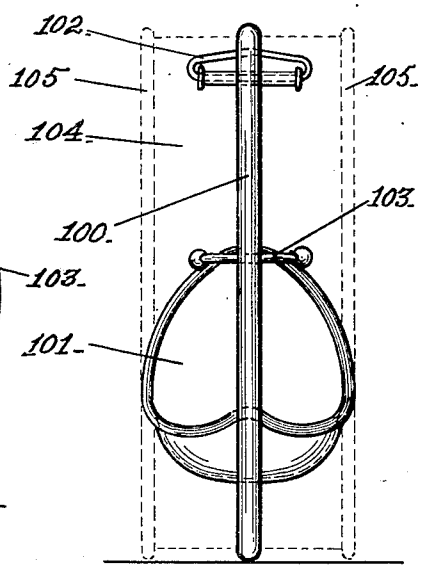


Fig. 34.



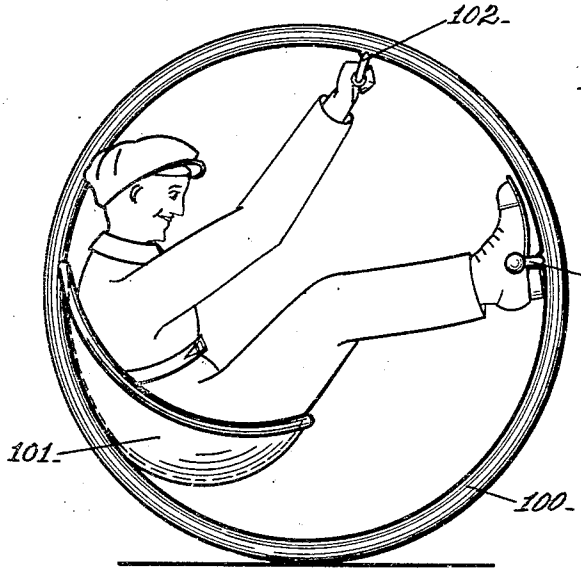


Fig. 33.

INVENTORS

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Patented Oct. 27, 1931 1,829,266

UNITED STATES PATENT OFFICE

WILLIAM F. DREW AND JAMES W. MARTINET, OF LOS ANGELES, CALIFORNIA

AMUSEMENT DEVICE

Application filed September 26, 1928. Serial No. 308,548.

Our invention relates to wheeled toys in general and more particularly to a wheeled toy designed to carry one or more occupants and be propelled and steered by the occupants.

The principal object of our invention is to provide a wheeled toy of new and novel design which will particularly appeal to the children using it.

Another object of our invention is to provide a wheeled toy which may be used as an occupant propelled vehicle or may be divided into two elements, an occupant propelled vehicle and a hoop to be rolled in the usual manner.

Other objects and advantages will be apparent from the following specification and claims.

In the drawings:

Figure 1 is a side view of one embodiment of our invention.

Figure 2 is a front view of the vehicle shown in Figure 1.

Figure 3 is a cross section on the line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a longitudinal section of Figure 1 showing the propelling mechanism.

Figure 5 is a transverse section through the body of the vehicle.

Figure 6 is a top view of the main frame.

Figure 7 is a plan view of the steering mechanism which goes on top of the main frame of Figure 6.

Figure 8 is a section on the line 8—8 of Figures 6 and 7 looking in the direction of the arrows showing the steering mechanism in its relation to the frame.

Figure 9 is a transverse cross section of the drive mechanism shown in Figure 4.

Figure 10 is a detailed side view of the drive mechanism.

Figure 11 is a cross section of the large hoop shown in Fig. 1.

Figure 12 is a perspective view from the front of a modification of our invention.

Figure 13 is a perspective view from the rear of the vehicle shown in Figure 12.

Figure 14 is a front view of the vehicle shown in Figure 12.

Figure 15 is a side view of the vehicle shown in Figure 12, showing the driving mechanism by means of dotted lines.

Figure 16 is a partial plan view of the main frame and drive mechanism of the vehicle shown in Figure 12.

Figure 17 is a partial side view of the main frame and drive mechanism of the vehicle shown in Figure 12.

Figure 18 is a cross section of the main frame and drive mechanism of the vehicle shown in Figure 12.

Figure 19 is a cross section of the main frame and front guide wheel of the vehicle shown in Figure 12.

Figure 20 is a cross section of the main frame and rear guide wheel of the vehicle shown in Figure 12.

Figure 21 is a cross section of the top guide wheel of the vehicle shown in Figure 12.

Figure 22 is a cross section of the hoop of the vehicle shown in Figure 12.

Figure 23 is a side elevation of another embodiment of our invention.

Figure 24 is a rear view of the vehicle shown in Figure 23.

Figure 25 is a longitudinal section of the steering mechanism of the vehicle shown in Figure 23.

Figure 26 is a cross section of the hoop used in connection with the vehicle shown in Figure 23.

Figure 27 is a side view of another embodiment of our invention.

Figure 28 is a front view of the vehicle shown in Figure 27.

Figure 29 is a section on line A—A of Figure 27 looking in the direction of the arrows.

Figure 30 is a section on line B—B of Figure 27 looking in the direction of the arrows.

Figure 31 is a cross section of the driving mechanism employed in the vehicle shown in Figure 27.

Figure 32 is a side view of another form of our invention showing the start of a revolution of the hoop.

Figure 33 is a side view of the apparatus shown in Figure 32 at a subsequent stage in the revolution of the hoop.

Figure 34 is a front view of the device shown in Figure 32.

Referring to Figures 1 to 11 inclusive, illustrating one embodiment of our invention, the vehicle body 1 is essentially oval when viewed from the top and is provided with seats 2, 2 at each end and a depressed portion 3 between the two seats for the feet of the occupants. The bottom of the body is an arc of a circle to conform to the inside of the hoop 4 and the ends 5, 5 of the body are raised to form backs for the seats 2, 2 while the sides of the body are depressed at the center to form an entrance 6 for easy ingress and egress.

The body 1 is mounted on a frame 7 which has a wheel 8 at its center and steering wheels 9, 9 at each end thereof. The body also has two steadying wheels 10, mounted one on each side at the center of the body to keep the vehicle from tipping over. These wheels 10 are mounted in pockets 11, one on each side of the vehicle body 1. The drive wheel 8 is enclosed in a pocket 12 formed in the center of the body 1 in the center depression 3 between the seats 2, 2 and extending from one seat to the other.

The guide wheels 9, 9 are pivoted at each end of the frame 7 and have a bar 13 secured to the upper end of the pivot above the frame 7. The two bars are connected by rods 14, 14 above and parallel to the main frame members 7, 7. These rods 14, 14 are provided with foot rests 15, 15 at their center. These foot rests are in the central depression 3 of the main body 1 on each side of the pocket 12. The guide rods 14, 14 are crossed near one end as shown in Figures 7 and 8 so that as one guide wheel is turned in one direction the other guide wheel turns in the opposite direction.

The main drive wheel 8 is driven by levers 15′, 15′ pivoted on top of the pocket 12. These levers are swung back and forth by the occupants of the car by means of handles on the upper end of the levers. The two levers 15′, 15′ are securely fastened to pin 16 about which they rotate and one lever is extended below this pin. A link 17 is pivoted to the lower end of this lever and to the side of a gear 18 so that the link 17 acts as a connecting rod to rotate the gear 18 when the lever 15′ is reciprocated. Gear 18 meshes with a gear 19 on the hub of the main drive wheel 8 thereby rotating the drive wheel. The gear 18 and the main drive wheel are mounted on ball bearings on shafts supported by the main frame. The main drive wheel 8 is made dished so that the supporting shaft of the gear 18 lies within the drive wheel. In this way the assembly is kept as narrow as possible.

The main drive wheel 8 has a rubber tire 20 on its periphery and this rubber tire fits the groove 21 on the inside of the hoop 4 which has a rubber tire 22 on its periphery to roll on the surface over which the vehicle is traveling. Wheels 22′, 22′ mounted on the frame near each end thereof also roll in the inner groove 21 of the hoop 4 and keep it in line with the vehicle. A rod 23 extending upward from the top of pocket 12 between the two operating levers 15′ has a wheel at its upper end which also runs in the groove 21 to keep the hoop from falling over sideways. The drive wheel 8 rolls on the inside of the hoop 4 and causes the hoop to roll along, these propelling the vehicle, which is steered by whichever one of the wheels 9 happens to be in engagement with the surface on which the vehicle is traveling.

The hoop may be removed and the vehicle used alone, the drive wheel 8 and the two guide wheels 9, 9 being so related that they roll on a plane surface as shown by line 24 in Figure 4. In that event the drive wheel 8 rolls directly on the surface upon which the vehicle is traveling and drives it while the two guide wheels 9, 9 steer the vehicle as before and it is maintained in an upright position by the steadying wheels 10, 10.

A second form of our invention is shown in Figures 12 to 22 inclusive. This form also has an occupant propelled vehicle surrounded by a hoop upon which the vehicle travels. The vehicle in this case is in the form of a go-cart or sulkey having a single seat 25 with main drive wheels 26, 26 on each side of the seat and a steering wheel 27 in front of the seat. This steering wheel is pivoted on the front end of a forward extension 28 of the main frame. The steering wheel is provided with a bar 29 at the top of the pivot and rigidly connected therewith. This bar is properly shaped to provide a rest for the occupant's feet and the vehicle is steered by properly manipulating the bar by means of the feet. The forward extension is tubular and one member slides within the other so that the guide bar 29 may be adjusted to the proper distance from the seat to fit the leg length of the user. The main frame is also extended to the rear of the vehicle at 30 and a steadying wheel 31 is mounted at the rearward extremity of this extension to prevent the vehicle from tipping over backwards.

The vehicle is driven by a vertical lever 32 pivoted on the forward extension 28 of the main frame and just ahead of the seat 25. This lever is provided with handles 33, 33 at its upper end, one on each side of the lever where they may be conveniently grasped by the occupant to reciprocate the lever back and forth about its pivot 34. The lever 32 extends below this pivot and a connecting rod 34*a* is pivoted to the lower end of this extension at 35 and the other end of the connecting rod is pivoted on a crank pin 36 on the side of a gear 37. This gear meshes with

a second gear 38 which is secured on the axle 39 of the vehicle. This axle is journaled near each end in the main frame 40 which supports the seat and to which the forward and rearward extensions are secured. The drive wheel 26′ is secured to the outer end of this driven axle 39. In this manner when the lever 32 is reciprocated about its pivot in the manner of a pump handle the main drive wheel 26′ is rotated and the vehicle propelled over the surface upon which it rests. The wheel 26 being free to rotate on the axle 39, functions as a differential axle, allowing the ensemble to turn.

The forward extension 28 and the rearward extension 30 are composed of two members spaced apart laterally. The hoop 41 which surrounds the vehicle passes through the spaces between these members and extends under and over the seat in the axis of the vehicle. The forward extension 28 has a concave guide wheel 42 journaled between the two members. The concave outer surface of this wheel rolls on the convex inner surface 43 of the hoop. This hoop is provided with a rubber tire 44 on its outer surface upon which the hoop rolls.

The rearward extension 30 also has a concave guide wheel 42′ journaled between its members. This guide wheel also rolls on the convex inner surface 43 of the hoop. These two guide wheels are entirely covered by housings 45 and 46 extending from and a part of the main body 25.

The tubular members 30, 30 extend backward under the seat and curve backward and upwardly to conform in general, with the inner circumference of the hoop 41 and terminate at approximately the uppermost point of the hoop. A third concave guide wheel 47 is journaled at the upper extremity of this extension and also contacts with the inner surface of the hoop. These guide wheels maintain the hoop in alignment with the main axis of the vehicle and also keep it from falling over sideways. As the vehicle is propelled along on a surface the hoop also rolls on the surface and so rotates about the vehicle and its occupant.

The hoop may be removed from about the vehicle by removing the outer ends of the extensions 28 and 30. The arcuate rearward extension 30 may have its upper end spring downward which allows the hoop 41 to slip out of the concave groove of guide wheel 47. The hoop can then be dropped from under the vehicle and used alone as a hoop. By replacing the forward steering wheel 27 the vehicle may also be used alone as an occupant propelled vehicle the same as it was with the hoop attached.

The third form of our invention is illustrated in Figures 23 to 26 inclusive. In this embodiment of our invention the vehicle is in the form of a tricycle. This tricycle is propelled as usual by the forward wheel but it differs from the usual tricycle in that it is steered by means of the two rear wheels. When used in connection with the hoop the front wheel of the tricycle runs in the concave inner surface of the hoop and the whole vehicle is steered by the two rear wheels.

The tricycle can be made in any manner but we prefer to make it with a frame having an upper tubular member 48, a lower member 49 and a third member 50, the three forming a triangle. The seat 51 is adjustably mounted, in the usual manner, on the upper member 48 of the frame. The fork 52 carrying the front wheel 53 is rigidly fixed to the frame at the junction of members 49 and 50. This front wheel has the usual pedals 54 to be operated by the feet of the user and propel the vehicle in the usual manner.

A rod 55 is inserted in the upper tubular member 48 of the frame and is free to turn therein. Handle bars 56 are fastened to the upper end of this rod in any usual manner so that they are adjustable on it. These handle bars rotate the rod in the upper member of the frame to steer the vehicle. A segmental gear 57 is fastened to the lower end of the rod where it extends from the lower end of the frame and this gear meshes with segmental gear 58 which is fastened to the upper end of the pivot 59. This pivot 59 is mounted to freely turn in a bushing 60 in the casting 61 which joins the lower ends of the members 48 and 49 and forms a housing for the segmental gears 57 and 58. The axle 61′ is rigidly fastened to the pivot 59 at its lower end and wheels 62, 62 are free to turn on the outer ends of the axle. The housing or casting 61 has a pocket 63 on the rear thereof formed by two parallel vertical webs joined at the top. A small guide wheel 64 is journaled in this pocket. This wheel and the front wheel 53 roll in the inner concave recess 65 of the hoop 66 which has a rubber tire 67 on the outside.

The front frame member 50 extends along the under side of the upper member 48 at its outer end. A tubular member 68 slips in the upper open end of the member 50 which is split at its outer end and provided with a clamp 69 to hold the member 68 in place. This member curves upward and forward and terminates near the inner periphery of the hoop at its uppermost point. A housing 70 is fastened to the upper end of this member and a small guide wheel 71 is journalled in this housing which is open on the upper side. This guide wheel runs in the inner concave groove 65 of the hoop and keeps it from falling over sideways.

The vehicle is propelled by pedaling the front wheel which tends to roll up the inside of the hoop. This rolls the hoop along the surface 72 and propels the vehicle which is steered by turning the back wheels about the

pivot 59 by means of the handle bars 56 and the intermediate mechanism.

To remove the hoop the clamp 69 is loosened and the guide wheel 71 and its support 68 removed. The tricycle can then be lifted out of the hoop and used in the usual manner. An auxiliary seat parcel carrier 73 may be placed on the front of the tricycle in place of the guide wheel support 68, as shown by the dotted lines in Fig. 25.

Another form of our invention is illustrated in Figures 27 to 31 inclusive. In this form a horse, or other desired figure, is mounted inside a broad hoop and the rocking of the horse propels the hoop in a novel manner. A horse 74, or any figure with desired accoutrements, has its back feet, or analogous portion, fastened to an inverted U frame 76. This frame has an axle 77 journaled in the downward extending ends. This axle 77 extends transversely of the figure and has concave wheels 78, 78 rigidly secured to it against the outside of the U frame 76. Rubber tired wheels 79, 79 are loosely journaled on the axle outside of the wheels 78, 78. A ratchet wheel 80 is secured to the axle and a pawl 81 is secured to the under side of the inverted U frame 76 and engages the teeth of the ratchet. This ratchet and pawl are so arranged that the ratchet wheel and the axle and wheels connected with it, can turn in a clockwise direction, as seen in Figures 27 and 31, but is prevented from turning in a counter clockwise direction. This serves a purpose that will be more apparent later in the description.

The front feet, or analogous portion, of the figure are rigidly secured to a bar 82 which is pivoted on top of an inverted U shaped frame 83. An axle 84 is journaled in the downwardly extending ends of the frame 83 and has concave wheels 85, 85 mounted on it adjacent the outside of the frame. Rubber tired wheels 86, 86 are mounted on the axle outside the concave wheels 85, 85. A pin 87 extending through the bar 82 and the inverted U frame 83 prevent any relative movement of the two as long as the pin is in place. The concave wheels 78, 78 and 85, 85 run on semi-cylindrical ribs 88 and 89 on the inside of the hoop or drum 90. Rubber tires 91, 91 are provided around the outside of the hoop at its edges for the hoop to roll on, and for protection of objects in the path of movement of the device. A rod 92 extends upward from the figure and has two pockets 93 at its upper end. These pockets have concave wheels 94 journaled in them and they run on internal ribs 95, 95 near the center of the hoop. The upper end of rod 92 is forked and extends around each side of the hoop 90 and has its ends connected by a bar or bridge 96, serving as a handle for moving the ensemble. The vehicle is propelled by rocking the horse. As the horse is rocked backwards, that is the forequarters elevated, the wheels 78 and 85 roll freely along the corrugations 88 and 89 so that the wheels 78 roll down the inside of the hoop and the wheels 85 roll up the inside of the hoop. As the horse is rocked forward the wheels tend to reverse and roll in the opposite direction. The ratchet and pawl prevent them from turning in this direction and so the hoop rolls forward or in a clockwise direction as seen in Figure 27. Repetitions of this cycle propels the device forward. Wheels 97, 97 may be fastened to the U frames by means of bow springs 98, 98 in such a manner that they strike the surface 99 as the horse is rocked and so absorb the shock that would otherwise result if the solidly mounted wheels 79, or 86 were to strike the surface 99.

The horse may be removed from the hoop 90 by removing rod 92 with its guide wheels. The horse may then be lifted out and pulled or pushed along on a surface on wheels 79, 79 and 86, 86. By removing pin 87 the front U frame 53 may be turned on its pivot and the horse steered as it is moved along.

Still another form of our invention is illustrated in Figures 32 to 34 inclusive. In this type a hoop 100 has a seat 101 formed on the inside thereof. This seat is bowl shaped and its lower edge extends towards the center of the hoop. Opposite the upper end of the seat a D shaped handle 102 is fastened to the inside of the hoop and opposite the lower end of the seat a cross bar 103 is fastened on the inside of the hoop. This cross bar has its ends slightly curved towards the center of the hoop. The hoop may be tubular as shown in full lines or it may be in the form of a cylinder 104 having external corrugations 105 as shown by the dotted lines of Figure 34. This form is used by a person seating himself in the seat, placing his feet on the cross bar 103 and grasping the handle 102. The person is then curled up inside the hoop without any part extending beyond the periphery of the hoop in the position shown in Figure 32. A slight shove with the foot starts the hoop rolling in a clockwise direction and the person rolls along with it.

The foregoing illustration and description of some of the preferred forms of our invention is not intended to define or limit the scope of the invention in any way but is intended merely by way of explanation and example. We claim as our invention all the changes, mechanical equivalents and substitutions which lie within the scope of the following claims.

We claim:

1. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, means, operable by said occupant, to propel said vehicle, and means on said body to maintain said vehicle and said hoop in a substantially vertical position while said vehicle is in motion.

2. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, means, operable by said occupant, to roll said hoop whereby said vehicle is moved, and means on said body adapted to maintain said vehicle and said hoop in a substantially vertical position while said vehicle is in motion.

3. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, means, operable by said occupant, to propel said vehicle, steering means for said vehicle, and means on said body adapted to maintain said vehicle and said hoop in a substantially vertical position while said vehicle is in motion.

4. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, means, operable by said occupant, to roll said hoop whereby said vehicle is propelled, steering means for said vehicle, and means adapted to maintain said vehicle in a substantially vertical position while said vehicle is in motion.

5. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, a wheel attached to said body, means, operable by said occupant, to rotate said wheel, and a groove inside said hoop, said wheel rolling in said hoop, said wheel rolling in said groove whereby the vehicle is propelled, and means adapted to maintain said vehicle upright while said vehicle is in motion.

6. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, a wheel attached to said body, means, operable by said occupant, to rotate said wheel, a groove inside said hoop in which said wheel rolls to roll the hoop along a surface and propel the vehicle, wheels at either end of said vehicle and alternately in contact with the surface upon which the hoop rolls, operable by the occupant to steer said vehicle, and guide wheels in contact with said surface to maintain said vehicle upright while said vehicle is in motion.

7. In an occupant propelled vehicle, a hoop, a body within said hoop, and adapted to roll therein, seats secured to said body, means on said vehicle, operable by said occupant, to roll said hoop along a surface whereby said vehicle is propelled, steering means on said vehicle and contacting with said surface and guide wheels secured to each side of said vehicle to maintain it in an upright position while said vehicle is in motion.

8. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, a wheel journaled on said body, means, operable by said occupant, to rotate said wheel, a groove on the inner periphery of said hoop in which said wheel rolls whereby said hoop is rolled along a surface and propels the vehicle, wheels pivoted to the body and in contact with the surface upon which the hoop rolls, means operable by said occupant for turning said wheels about said pivots to steer the vehicle and guide wheels secured to said vehicle and adapted to maintain it in an upright position.

9. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, a wheel journaled on said body, means operable by said occupant, to rotate said wheel, a groove on the inner periphery of said hoop in which said wheel rolls whereby said hoop is rolled along a surface and propels the vehicle, wheels pivoted to the body and in contact with the surface upon which the hoop rolls, and means operable by said occupant for turning said wheels about said pivots to steer the vehicle, a wheel secured to said body and engaging the groove on the inner periphery of the hoop at its uppermost point, and guide wheels on said vehicle adapted to maintain it in an upright position.

10. In an occupant propelled vehicle, a hoop, a body within said hoop, seats secured to said body, a wheel journaled on said body, means operable by said occupant, to rotate said wheel, a groove on the inner periphery of said hoop in which said wheel rolls whereby said hoop is rolled along a surface and propels the vehicle, wheels pivoted to the body and in contact with the surface upon which the hoop rolls, and means operable by said occupant for turning said wheels about said pivots to steer the vehicle, a wheel secured to said body and engaging the groove on the inner periphery of the hoop at its uppermost point and guide wheels secured to each side of said vehicle and co-acting with the surface upon which the hoop rolls to maintain the vehicle in an upright position.

11. In an occupant propelled vehicle, a hoop upon which the vehicle progresses, and means on said vehicle adapted to maintain said vehicle and said hoop in an upright position while said vehicle is in motion.

In witness whereof, we have hereunto signed our names.

WILLIAM F. DREW.
JAMES W. MARTINET.