

[54] ENGINE DRIVEN CART

[75] Inventor: Alexander C. Park, Monument Beach, Mass.

[73] Assignee: A & C Park Incorporated, Monument Beach, Mass.

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[52] U.S. Cl. .... 280/96.1, 180/82, 180/77, 180/89, 180/1 R

[51] Int. Cl. .... B60p

[58] Field of Search ..... 180/82, 77, 89, 70, 1; 280/96.1

[56]

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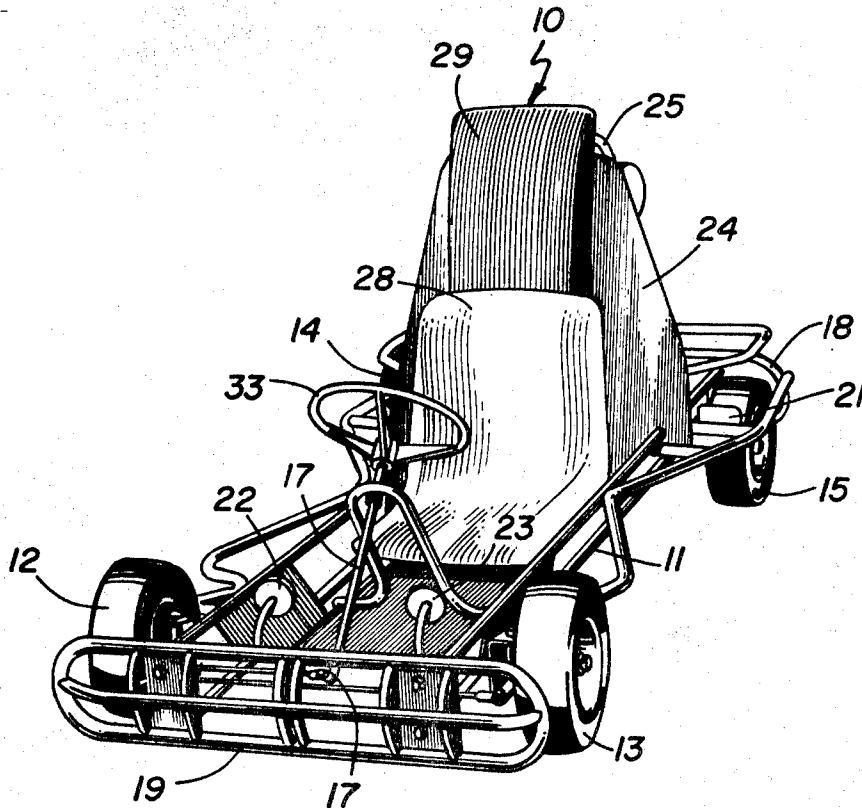
Primary Examiner—Allen N. Knowles  
Attorney, Agent, or Firm—Norman S. Blodgett; Gerry A. Blodgett

[57]

ABSTRACT

A cart for amusement purposes having an elongated chassis at the ends of which are located pairs of wheel assemblies, there being an engine mounted on the chassis for driving one of the pair of wheel assemblies.

4 Claims, 16 Drawing Figures



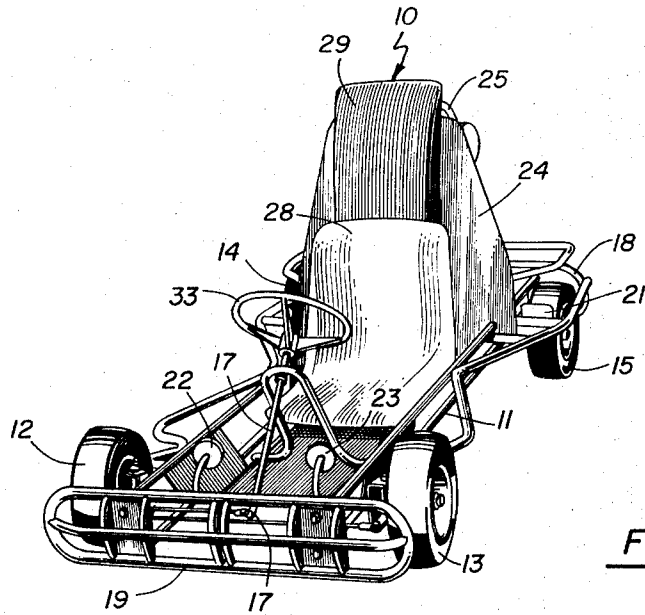


FIG. 1

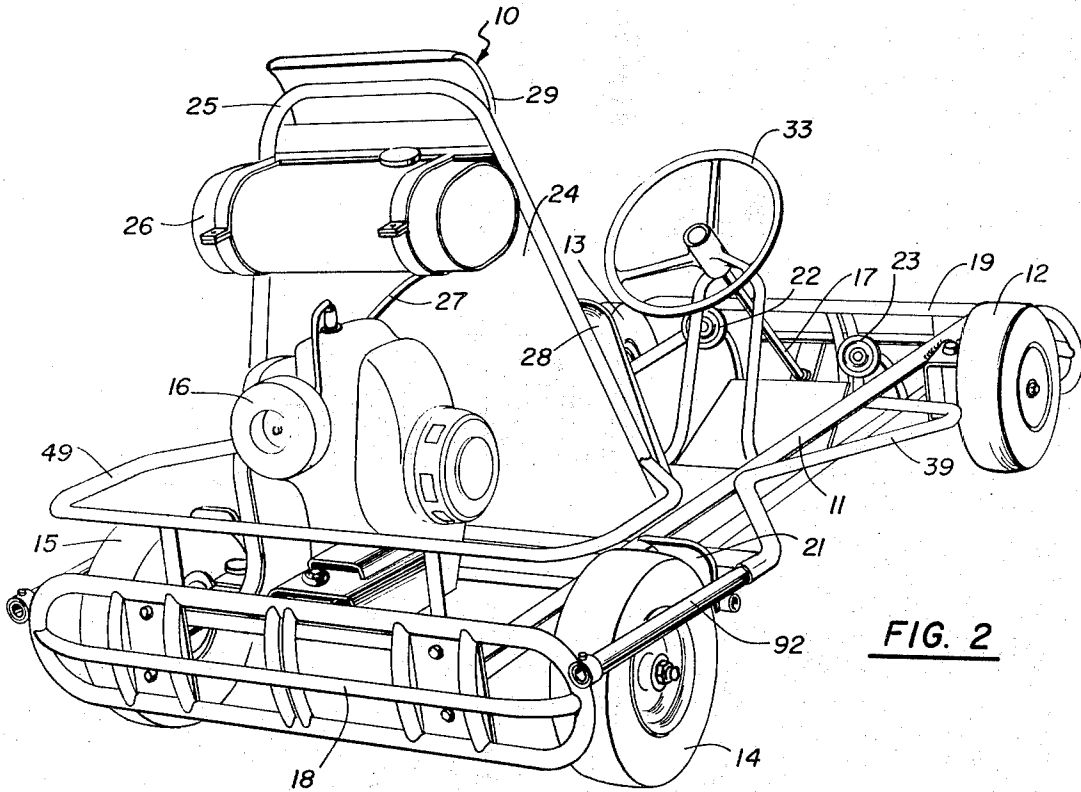


FIG. 2

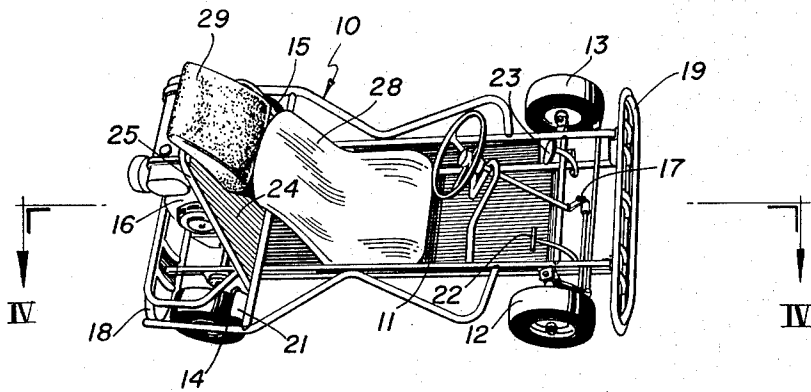


FIG. 3

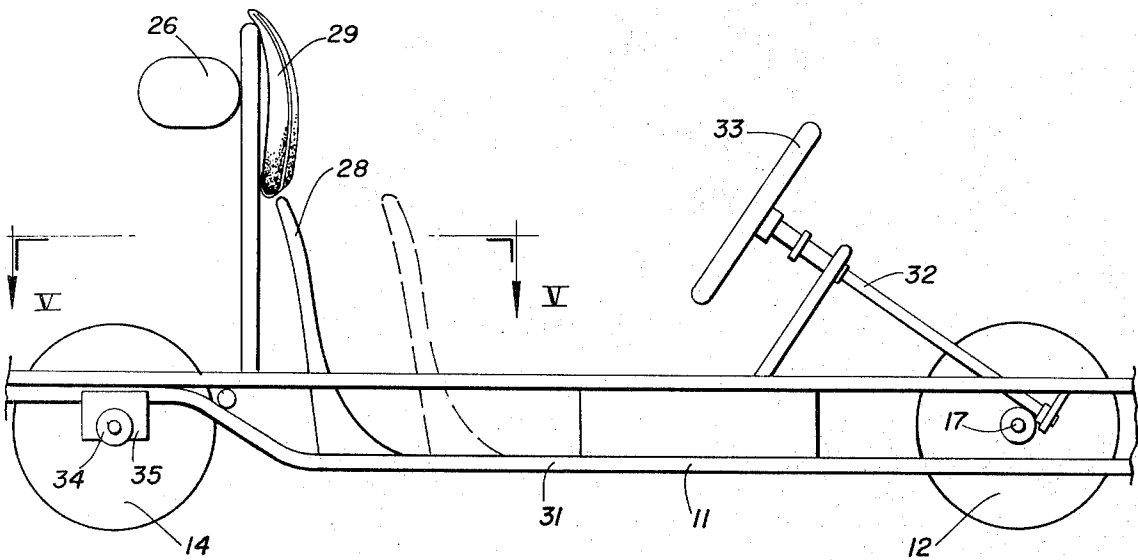


FIG. 4

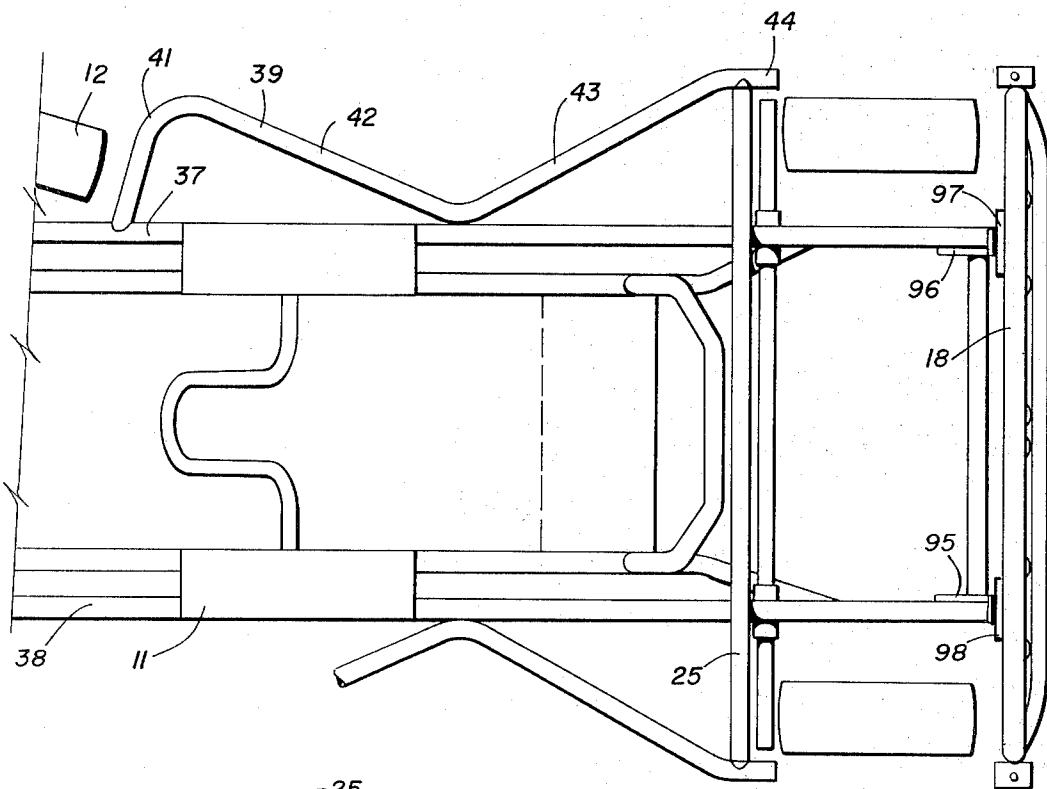


FIG. 5

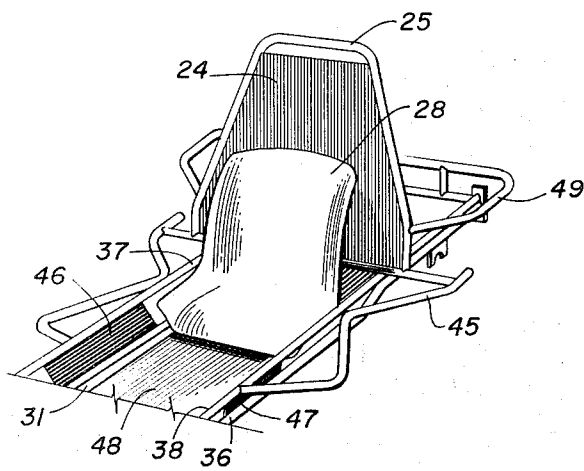


FIG. 6

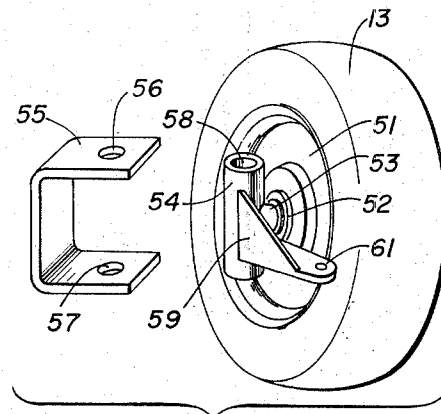


FIG. 7

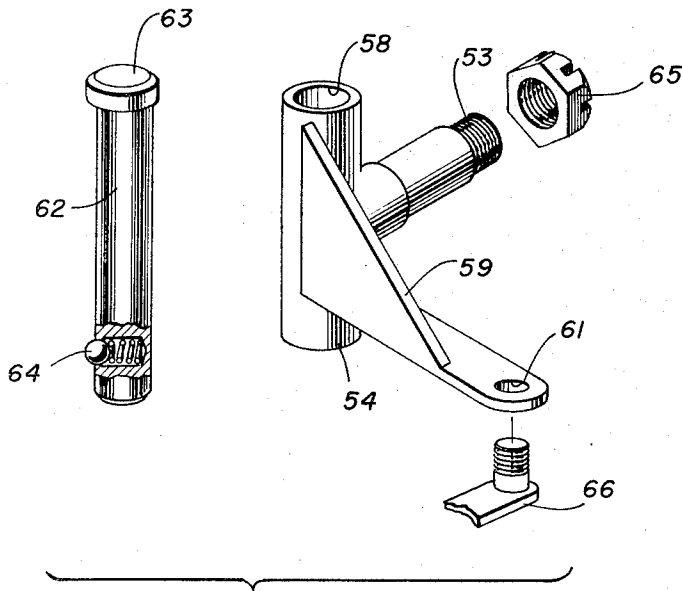


FIG. 8

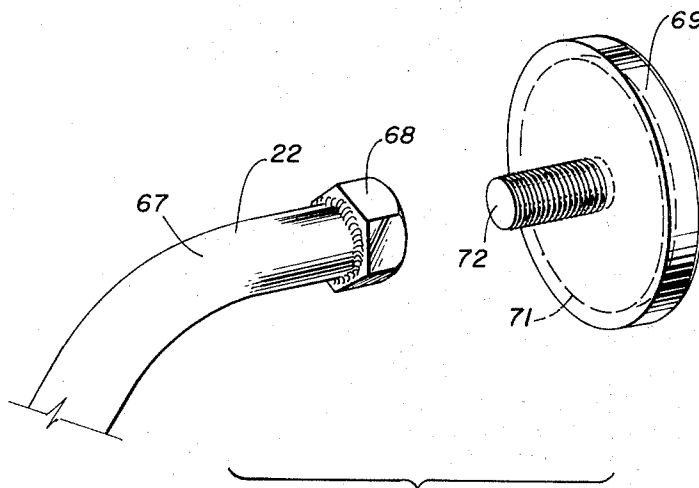


FIG. 9

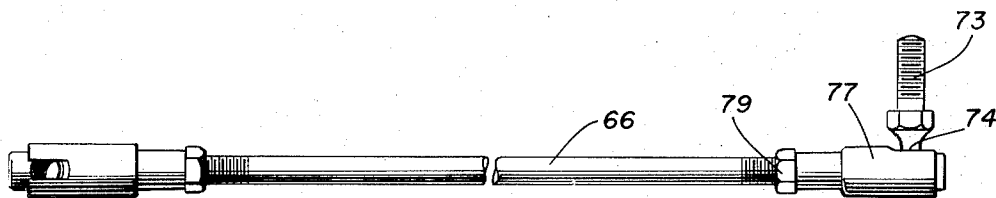


FIG. 10

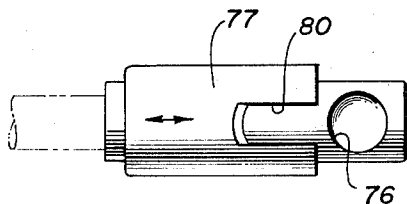


FIG. 11

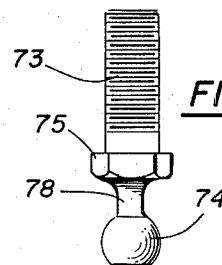


FIG. 12

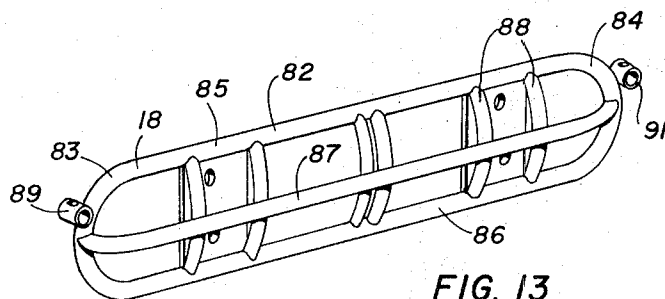


FIG. 13

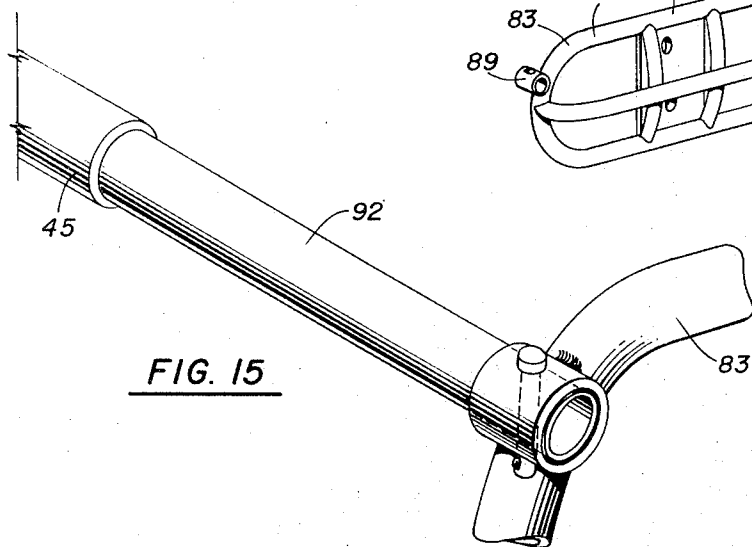


FIG. 15

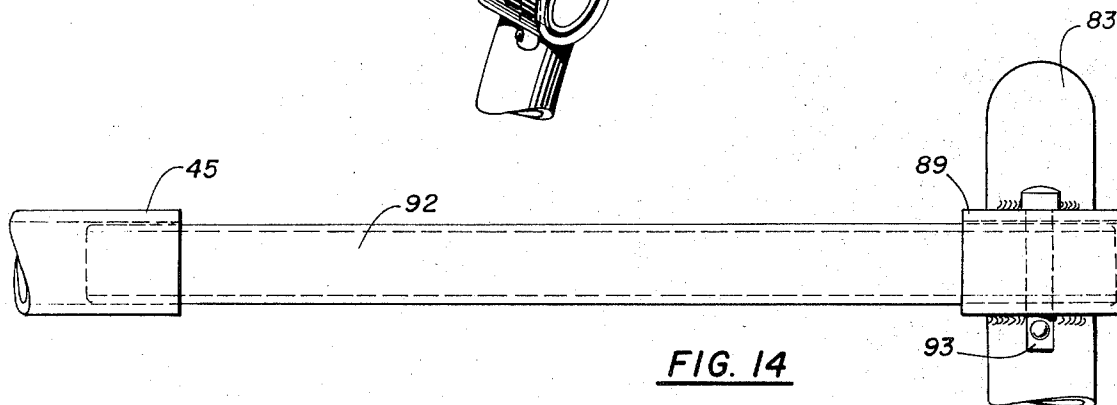


FIG. 14

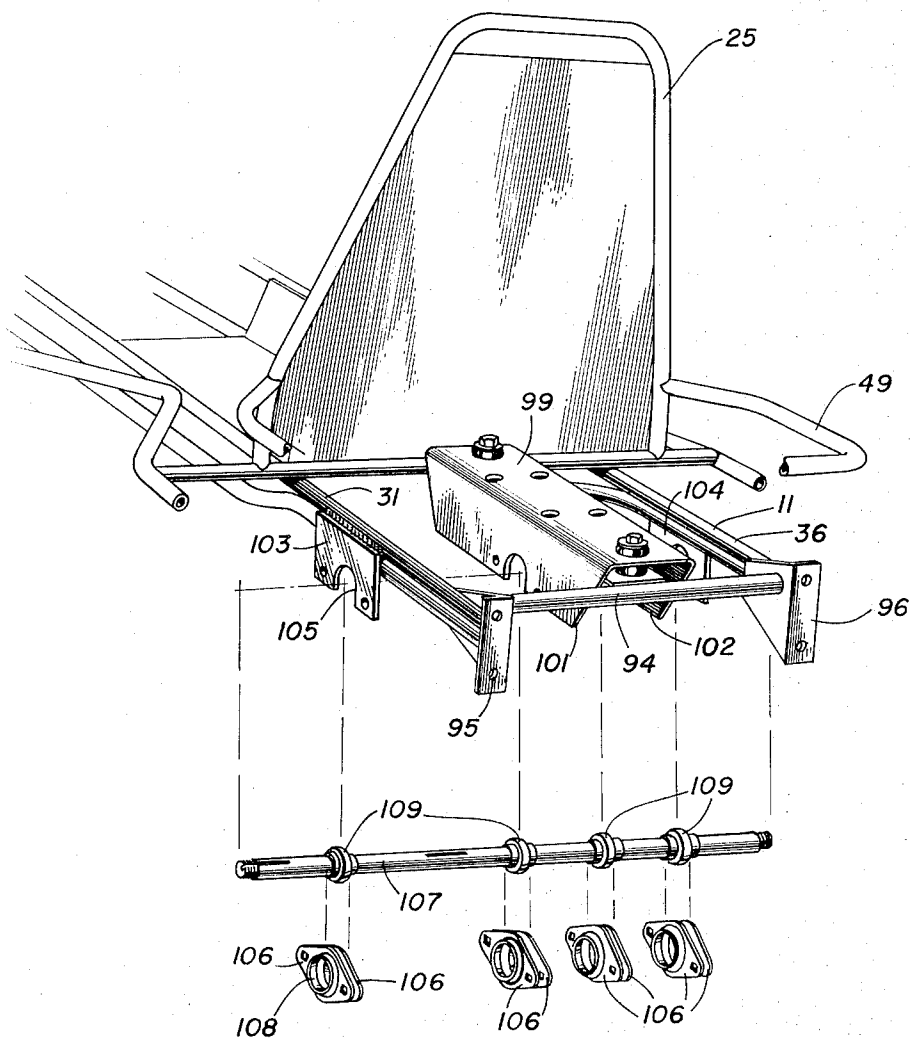


FIG. 16

## ENGINE DRIVEN CART

## BACKGROUND OF THE INVENTION

It has become common practice to make use of small, engine-driven, wheeled vehicles for amusement purposes. Generally speaking, these vehicles, known as "carts," are used on private property under unlicensed and unregistered conditions. They are usually of very light weight construction, using a small horsepower internal combustion for their motor force. Because of the unregistered operation, they do not conform to the safety standards demanded of automobiles. When these vehicles are used on a concession basis and are rented to young people for use on a concessionaire's track, a number of problems rise. For one thing, while it is not necessary to conform to state motor vehicle registry standards of safety, yet, nevertheless, the concessionaire is to a considerable extent liable if the operators are hurt while renting a cart in his concession area. There is a tendency for the operators of such carts to race against one another, to occasionally strike one another's vehicle, and to have accidents due to the propensity of young people to use loose clothing and long hair. Furthermore, after the operator of the concession has purchased a vehicle, in order for him to obtain a return on his capital investment, it is necessary that the vehicle be available for rental at all times that customers are likely to wish to operate a cart. There are times, for instance, when there are many customers awaiting to rent carts, while at other times there are no customers. Nevertheless, if a cart is rendered inoperable during the time when there are many customers available, the concessionaire's opportunity to obtain profit from that vehicle is lost for the time it takes to repair the vehicle. In the past, repairs to carts have been time-consuming and have required the use of skilled mechanics which are sometimes not readily available. As a matter of fact, the difficulty in making rapid repairs to the cart made it necessary for the concessionaire to purchase an inexpensive cart which did not have adequate safety equipment. Otherwise, he could not make a profit on the rental of the cart, particularly if the cart were an expensive one. These and other difficulties experienced with the prior art devices have been obviated in a novel manner by the present invention.

It is, therefore, an outstanding object of the invention to provide a cart which is easy to maintain and repair with unskilled labor.

Another object of this invention is the provision of a cart which the major elements that commonly need repair are quickly replaceable.

A further object of the present invention is the provision of the cart which is safe to operate and which is particularly free of danger due to loose clothing or long hair on the part of the operator.

It is another object of the instant invention to provide a cart which is relatively expensive, due to the provision for a high degree of safety, but which, because of its ability to be rapidly repaired, assures the concessionaire of profit despite its initial high cost.

A still further object of the invention is the provision of a cart so constructed that it can be quickly repaired by persons having a minimum of mechanical skill.

It is a further object of the invention to provide a cart having rear wheels which are protected from damage by other carts.

It is a still further object of the present invention to provide a concession cart which has a strong and safe construction, but which can be operated profitably.

## SUMMARY OF THE INVENTION

In general, the invention consists of a cart having an elongated chassis, having pair of wheel assemblies mounted at each end of the shaft, and having an engine mounted on the chassis in driving connection with one pair of wheel assemblies.

More specifically, the engine drives a rear pair of wheel assemblies and steering takes place by means of a front pair of wheel assemblies. Means is provided for the rapid disconnection and replacement of one of the front wheel assemblies. A readily replaceable guard is provided for the rear pair of wheel assemblies, the guard being capable of protecting the side and rear of each of the rear wheel assemblies. The operating pedals are protected with an elastomer material for safety purposes and yet are capable of being readily replaced in the case of wear. A combined roll bar and fire wall lies between the operator and the engine for safety purposes. Rear axle and rear wheel assemblies are readily removable as a unit for replacement. The motor control and braking systems are suitably protected against damage and guarded for safety purposes.

## BRIEF DESCRIPTION OF THE DRAWINGS

The character of the invention, however, may be best understood by reference to one of its structural forms, as illustrated by the accompanying drawings, in which:

FIG. 1 is a perspective view from the front of a cart embodying the principles of the present invention,

FIG. 2 is a perspective view of the cart taken from the rear,

FIG. 3 is a perspective view of the cart taken from above,

FIG. 4 is a vertical longitudinal sectional view of the cart taken on the line IV—IV of FIG. 3,

FIG. 5 is a horizontal sectional view of a portion of the cart taken on the line V—V of FIG. 4,

FIG. 6 is a perspective view of the chassis of the cart before major elements have been added,

FIG. 7 is a perspective view of a portion of the cart including a wheel assembly,

FIG. 8 is a perspective view of a portion of the wheel assembly,

FIG. 9 is a disassembled perspective view of an operating pedal,

FIG. 10 is a front elevational view of a steering linkage,

FIG. 11 is an enlarged view of a portion of the steering linkage, and

FIG. 12 is an enlarged view of another portion of the steering linkage,

FIG. 13 is a front elevational view of a bumper and wheel guard,

FIG. 14 is a perspective view of a portion of the wheel guard,

FIG. 15 is a perspective view of a portion of the wheel guard, and

FIG. 16 is a perspective disassembled view of the rear end of the chassis of the cart showing the manner in which the wheel rear axle is attached.



### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIGS. 1, 2, and 3, wherein are best shown the general features of the invention, the cart, indicated generally by the reference numeral 10, is shown as having an elongated chassis 11, having a pair of wheel assemblies 12 and 13 mounted at its front end, and having another pair of wheel assemblies 14 and 15 mounted at the rear end. Mounted on the chassis 11 at the rear end adjacent the rear wheel assemblies 14 and 15 is an engine 16. This engine is of the type usually used in gas carts and in the preferred embodiment it is a single cylinder, internal combustion engine of approximately 4 horsepower. The steering mechanism 17 for controlling the front wheel assemblies 12 and 13 is mounted at the forward end of the chassis. A guard assembly 18 is associated and mounted on the rear end of the chassis, while a front guard assembly 19 is mounted on the front end. A brake assembly 21 is mounted at the rear end of the chassis 11 for engagement with the rear wheel assemblies 14 and 15. Pivotaly mounted on the front end of the chassis 11 are two pedals 22 and 23, pedals being movable about a transverse horizontal axis. Pedal 22 is a throttle pedal which is connected to the throttle of the engine 16, while the pedal 23 is a braking pedal connected to the braking assembly 21.

A sheet metal fire wall 24 extends upwardly from the rearward portion of the chassis adjacent the engine 16 and a roll bar 25 extends about its periphery and has its ends connected to the chassis. A gas tank 26 is mounted on the back surface of the fire wall 24, the gasoline being fed by gravity into the engine 16. It is, therefore, mounted independently of the engine and is connected to it by a flexible fuel hose 27. Mounted on the chassis and resting against front of the fire wall 24 is a plastic seat 28. Mounted on the fire wall and the roll bar on the front surface thereof, above the seat 28, is a headrest 29.

FIG. 4 is a longitudinal sectional view of the cart showing particularly well the manner in which the chassis 11 is provided with a longitudinal tubular structural member 31. A control rod lies in this structural member and is attached at one end to the gas pedal 22 and at the other end to the throttle of the engine 16, it being spring biased internally of the member 31 to the "no gas" position. A similar tubular structural member is located at the other side of the chassis and contains a control rod leading from the brake pedal 23 to the braking assembly 21. This view also shows the steering column 32 connected at one end to the steering mechanism 17 and having at that other end a conventional steering wheel 33. Means is provided for adjusting the seat 28 on the chassis from a rearward position against the fire wall 24 to the forward position shown in dotted lines. The rear wheel assemblies 14 and 15 are mounted on opposite ends of a transverse axle 34, which in turn, is rotatably mounted in downwardly depending plates 35 which are fastened to the underside of the chassis 11.

FIG. 5 shows certain other features of the invention. For instance, it shows a tubular structural member 36 in the lower part of the chassis for carrying the control rod from the brake pedal 23 to the braking mechanism 21. It also shows two side tubular structural members 37 and 38 which lie upwardly and outwardly of their

corresponding structural members 37 and 38 which lie upwardly and outwardly of their corresponding structural members 31 and 36. Welded to and extending outwardly of the structural member 37 is a guard element 39 having its inner end welded to the frame structural element 37 and extending transversely or horizontally therefrom. A first portion 41 lies immediately behind the right front wheel assembly 12 and extends outwardly well beyond it. The outer end of this first portion is bent around and merges into a second portion 42. This portion extends at an acute angle to the structural member 37 and has its inner end welded thereto. The guard element 39 then is bent around into a third portion 43 which extends outwardly at substantially the same angle as the second portion 42. The angle between the second and third portion, therefore, is an obtuse angle of around 135°. The outer end of the third portion 43 is bent and is connected to a longitudinal fourth portion 44 which is parallel to and spaced from the structural member 37. The central portion of the fourth portion 44 is welded to a transverse cross member forming part of the chassis, but its rearward end is free for attachment to the rear guard 18. A similar guard element 45 (see FIG. 6) is mounted on the other side of the chassis.

FIG. 6 illustrates the way in which the inner portion of the chassis is formed into a tray by welding an inclined plate 46 to the structural members 31 and 37, an inclined plate 47 between the lower structural members 31 and 36. Finally at the rear of the chassis is securely welded an engine guard 49 which is formed of tubing and which completely envelopes the engine area a substantial distance above the level of the wheel assemblies.

FIG. 7 shows the details of the left front wheel assembly 13 which is similar to but a mirror image of the right hand wheel assembly 12. A rubber-tired wheel 51 is mounted on a roller bearing 52, which, in turn, is mounted on a horizontal axle 53. This axle extends inwardly of the vehicle and is welded to the central portion of a vertical tube 54. This tube is adapted to be mounted between the legs of a U-shaped bracket 55, which is securely welded to the chassis 11. The upper leg of the bracket is provided with a bore 56, while the lower leg is provided with an aligned bore 57. The inner bore of the tube 54 is aligned with these bores 56 and 57 during assembly and normally held together in a manner to be described hereinafter. Welded to the tube 54 and extending forwardly therefrom at a right angle to the axis of the axle 53 is a bell crank or steering arm 59, having at its outer end a vertical bore 61 for attachment to a steering link.

FIG. 8 shows further details of the wheel assembly. A steering pin 62 is provided to be slid through the bore 56 in the bracket, the bore 58 in the tube 54, and the bore 57 in the bracket. For that purpose it is provided with a head 63 at its upper end and a spring-loaded detent 64 at its lower end. The drawing shows the nut 65 which is adapted to be screwed to a bolt at one end of a steering link 66.

FIG. 9 shows the construction of the throttle pedal 22, which is exactly similar to the brake pedal 23. It is provided with a crank arm 67 whose upper end has a nut 68 welded to it. Mounted on this upper end is a pad 69 consisting of a body of elastomer material in which is embedded a disk-like core 71. Extending from the center of the core and from the center of the pad is a

threaded stem 72 adapted to be threaded into the threaded bore of the nut 68.

FIG. 10 shows the general construction of the steering linkage 66. Extending upwardly from the steering rod 66 is a bolt 73 adapted to cooperate with the bore 61 in the wheel assembly and to receive the nut 65. The lower end of the bolt 73 is provided with a ball or steering knuckle 74 and adjacent the knuckle a wrench-engaging surface 75. The knuckle 74 is located for universal motion in a pocket 76 formed adjacent the end of the steering rod 66. A sleeve 77 is slidable over the end of the rod and is provided with a slot 80 which is substantially smaller than the width of the pocket 76. It is, however, larger than the diameter of a neck 78 formed on the bolt 73 between the knuckle 74 and the wrench-engaging surface 75. The sleeve, therefore, prevents the knuckle from leaving the pocket yet it allows a degree of universal motion between the knuckle 74 and the rod. The sleeve 77 is biased toward the end of the rod by a coil spring which lies closely adjacent the surface of the rod 66 which engages an adjustable nut 78 at its inner end and has its outer end pressed against a suitable internal shoulder in the sleeve 77. The sleeve, therefore, is spring loaded to its position with the slot 80 surrounding the neck 78 on the bolt. In order to remove the knuckle 74 from the pocket 76 in the rod it is only necessary to force the sleeve 77 inwardly against the spring compression and it can be removed. The bolt 73 normally stays or remains with the wheel assembly locked in place on the arm 59 by the nut 65.

FIG. 13 shows the manner in which the rear guard assembly 18 is provided with a loop 82. As is evident in the drawing, the loop 82 consists of semi-circular end portions 83 and 84 joined by two parallel straight portions 85 and 86. Extending from the center of the end portion 83 to the center of the end portion 84 is a bar 87 which lies rearwardly of the plane of the loop 82 by a substantial amount, but curves back toward the ends where it is welded to the end portions of the loop. Finally, intermediate bars 88 join the straight portions 85 and 86 of the loop to the bar 87. At the ends of the guard assembly and welded to the semi-circular end portions 83 and 84 are sockets 89 and 91. In FIG. 14 it can be seen that the socket 91 has an inside diameter fitting snugly around the longitudinal bar 92, which extends rearwardly from the stub or fourth portion 44 (see FIG. 5). Socket 91 and the bar 92 have matching vertical apertures and through these apertures extends a lock-pin 93, shown best in FIG. 15. The pin is provided with an enlarged head at its upper end and with a spring loaded detent at its lower end; it is, therefore, similar to the steering pin 62 in FIG. 8, but is, of course, considerably smaller. The bar 92 is slidably held in place within the stub tube 44 forming part of the chassis, extends across the rear wheel assembly 14 at a level about half way between its axle and its upper periphery, as can be seen in FIG. 2.

FIG. 16 shows the manner in which the rear wheel assemblies 14 and 15 are attached to the chassis. The longitudinal tubular structural members 31 and 36 of the chassis extend rearwardly of the roll bar 25 and are connected at the rear end of the chassis by a cross bar 94. The intersections of the cross bar and the structural members 31 and 36 are provided with brackets 95 and 96 to which the rear guard assembly 18 is connected. As can be seen in FIG. 5, these brackets are provided

with rubber blocks 97 and 98 through the medium of two bolts for each bracket. A motor-mounting plate 99 extends across the chassis from the bar 94 to a horizontal structure member 100 underlying the roll bar 25. It is to this plate 99 that the motor is fastened. Extending downwardly from the longitudinal edges of the plate 99 are flanges 101 and 102. From the central portions of the structural members 31 and 36 extend downwardly extending plates 103 and 104. The edges of the flanges 101 and 102 and the bottom edges of the plates 103 and 104 are each provided with a semi-circular notch 105, there being an aperture at each side of each notch in which can be fastened the ears of retainer plates 106, each of which has a central circular aperture 108 through which the axle 107 passes. These plates serve to retain roller bearings 109 in which the axle 107 is rotatably mounted. It can be seen, then, that the rear wheel assemblies 14 and 15 are mounted on the axle 107 after the axle has received the bearings 109 and the retainer plates 106. The entire assembly of axle and wheel assemblies is bolted into the notches 105 in the preferred embodiment by the use of eight bolts. The entire assembly can be dropped by simply loosening those eight bolts.

The operation of the invention will now be readily understood in view of the above description. The cart is operated in the usual way by starting up the engine 16 by use of a hand starter located on the right hand side of the engine. Gasoline flows from the gas tank 26 through the flexible fuel line or tube 27 to the carburetor of the engine. The output shaft of the engine is connected through a clutch, a gear, and a sprocket chain to a gear mounted on the rear axle 107. The gear and sprocket chain are covered by a sheet metal shield 90 (FIG. 1) located at the left side and extending upwardly from the chassis. Forward motion of the pedal 26 caused the engine to accelerate, there being an adjustable stop to limit such action. The engine idling speed is set so that power does not pass from the engine output shaft through the centrifugal clutch to the rear axle until the engine has been accelerated above idling speed by operation of the pedal. The left hand pedal is the brake pedal and this can be used for stopping the cart. Steering takes place by use of the steering wheel 33 operating through the steering mechanism 17 to the front wheel assemblies 12 and 13. The fire shield 24 stands higher than normal adult's head and any fire that could possibly take place in the vicinity of the engine would be shielded from the occupant of the car. Independent mounting of the gasoline tank 26 relative to the engine 16 removes a constant source of maintenance and possible danger in the connections between the gas tank and the engine found in the prior art carts. The flexible tube 26 compensates, of course, for relative motion between the two. The large guard assemblies 18 at the rear and 19 at the front, not only protect the occupant, but also protect the wheels and tires from damage. In both cases they extend laterally well beyond the outside faces of the wheels. Furthermore, the back assembly includes the longitudinal bars 92 to protect the side surfaces of the rear wheel assemblies 14 and 15. The back surfaces of the articulated front wheel assemblies 12 and 13 are protected by the laterally extending first portion 41 of the guard element 39 on the right side and the corresponding element on the left side. Furthermore, the engine 16 is protected by the engine guard 49 extending around the rear of the cart and

attached at its ends to the roll bar 25 and in its central portion to the chassis proper by vertical bars. Both the rear guard assembly 18 and the front guard assembly 19 are connected to the chassis through large rubber blocks which serve to absorb shock.

If it is desirable to change the front wheel assembly, say the front wheel assembly 13, as is often the case with carts at concessions, it is only necessary to depress the detent 64 in the pin 62 and the pin can be readily withdrawn. The next step is to slide the sleeve 77 toward the center of the machine against the pressure of the spring 81 and this permits the release of the steering knuckle 74 from the steering rod. The wheel assembly 13 is then free and can be removed and a new one put in its place. When the pedal 22 and 23 become worn, it is only necessary to rotate the pad 69 and unscrew the threaded stem 72 from the threaded nut 68 on the arm 67. The pad is thus removable and can be replaced by a new pad. If the rear guard element 18 is damaged, it is only necessary to withdraw the pins 93 from the sockets 89 and 91 and loosen the four bolts which are attached through the pads 97 and 98 to the brackets 96 and 95 respectively. The guard is then free and it can be replaced with a new rear guard assembly. At the front the rear guard assembly 19 requires removal of only four bolts. When damage occurs in the rear wheel assemblies 14 and 15, the axle 107, or the bearings associated therewith, it is only necessary to remove the eight bolts which hold the retaining plates 106 in the notches 105 formed in the plates 103 and 104 and the flanges 101 and 102. The entire unit of axle, bearings, and wheel assemblies drops and can be replaced with a similar unit.

It can be seen, then, that a great many of the disadvantages of the prior art concession cart have been overcome by the present construction. Legal claims from injuries caused by long hair, loose clothing, belts, cords or ropes from jackets being caught in the rewinds, axles, clutches, and sprockets of the device or from riders reaching behind them and bending linkages and changing adjustments on the engine have been removed. The fire wall completely separates the rider from all engine control linkages and drive train components rear of the seat. It has been common practice for riders to bend the accelerator rod to increase the speed of the cart and this is done away with because the accelerator rod is fully encased in the longitudinal tubular structural member integral with the chassis. Injuries have been caused in the past to riders by cutting into or in front of other carts and with the front wheel climbing the front wheel of the other cart. This is prevented by the inclined bar extending behind the front wheels which also keeps the wheels from locking. It should be noted that the breaking assembly is completely protected by the rear guard assembly and the bar 92 extending along the side of the wheel and brake assembly. The rear axle 107 is protected from being bent and broken or the wheels bent and damaged from constant collision and bumping by the provision of the rear wheel guards which are provided entirely around the rear wheels. These are quickly replaceable. The excessive downtime and loss of revenue from the slow antiquated method of removing the axles in order to change a hub is done away with by the use of the split sprockets and split hubs associated with the rear wheel assemblies and from the quick removal method incorporated in the front wheel assemblies.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, however, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

The invention having been thus described, what is claimed as new and desired to secure by Letters Patent is:

1. A cart, comprising
  - a. an elongated chassis,
  - b. a pair of wheel assemblies mounted at each end of the chassis,
  - c. an engine mounted on the chassis and drivingly connected to one pair of wheel assemblies, and
  - d. quick disconnect means associated with one of the wheel assemblies to permit its replacement in a short period of time,

wherein the wheel assembly consists of a substantially vertical tube from the center of which horizontally extend an integral axle and an integral crank arm at a right angle to each other, and wherein a bearing is mounted on the axle and a wheel on the bearing, and

wherein the chassis is provided with an integral U-shaped bracket having two parallel, spaced arms extending laterally of the chassis, wherein aligned apertures are formed at the ends of the arms, and wherein a king pin extends through the apertures and the tube, and

wherein the king pin is provided at its upper end with a head that lies adjacent the upper arm of the bracket and at its lower end with a spring-loaded detent that lies adjacent the lower arm of the bracket.

2. A cart, comprising
  - a. an elongated chassis,
  - b. a pair of wheel assemblies mounted at each end of the chassis,
  - c. an engine mounted on the chassis and drivingly connected to one pair of wheel assemblies, and
  - d. quick disconnect means associated with one of the wheel assemblies to permit its replacement in a short period of time, the quick disconnect means including a king pin which is provided at its upper end with a head that lies adjacent the upper arm of the bracket and at its lower end with a springloaded detent that lies adjacent the lower arm of the bracket.

3. A cart, comprising
  - a. an elongated chassis,
  - b. a pair of wheel assemblies mounted at each end of the chassis,
  - c. an engine mounted on the chassis and drivingly connected to one pair of wheel assemblies, and
  - d. quick disconnect means associated with one of the wheel assemblies to permit its replacement in a short period of time, the means including a locking element effective to connect one of the wheel assemblies to the chassis, the element being so constructed that the application of a small linear force to a portion of the element renders the element ineffective in connecting the wheel assembly to the chassis.

4. A cart as recited in claim 3, wherein the means includes a detent element which opposes the movement of the locking element from a position but is overcome by the force.