May 15, 1962 R. E. GRAHAM 3,034,785

AMUSEMENT APPARATUS

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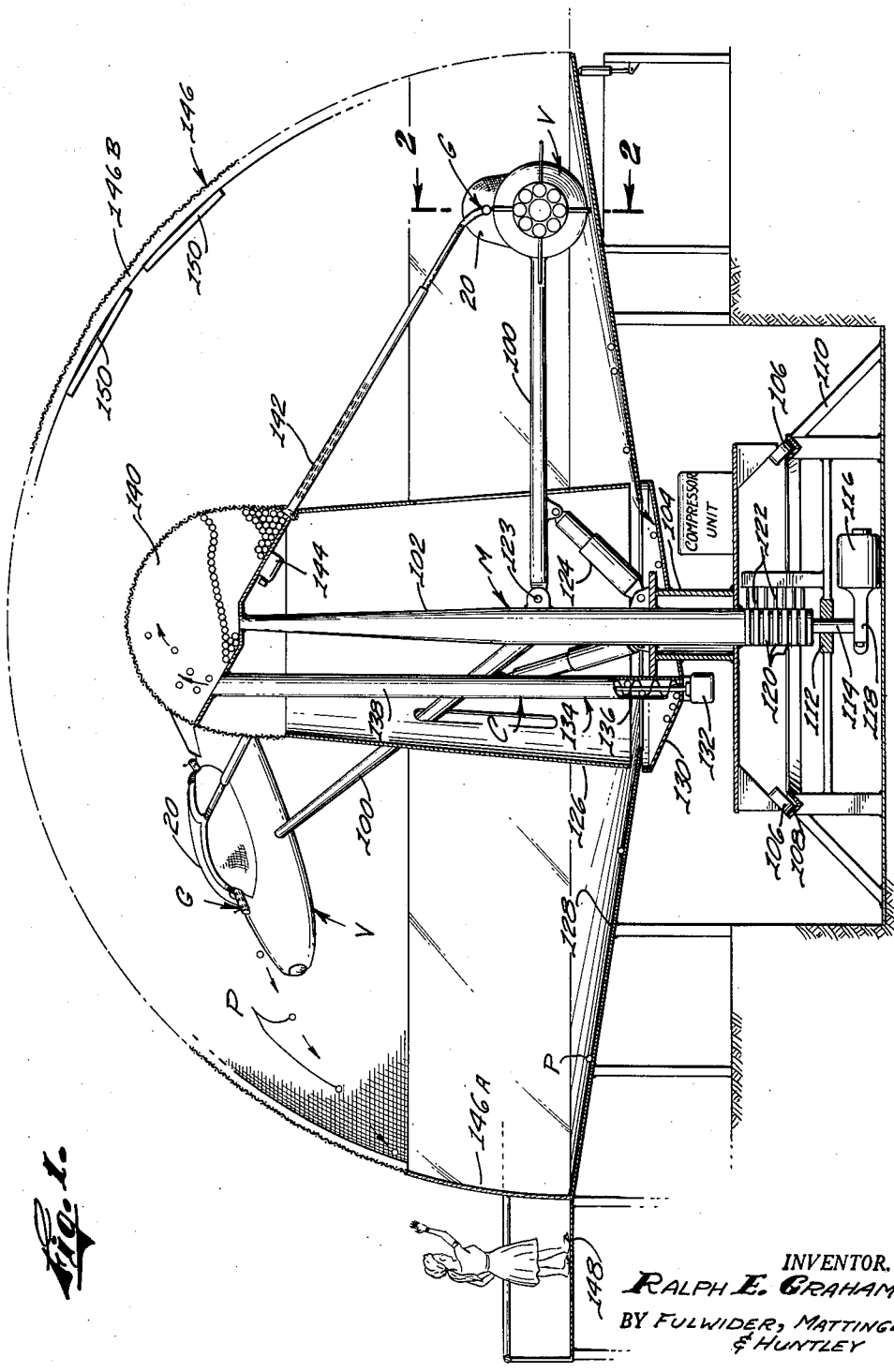

Fig. 1.

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Fig. 2.

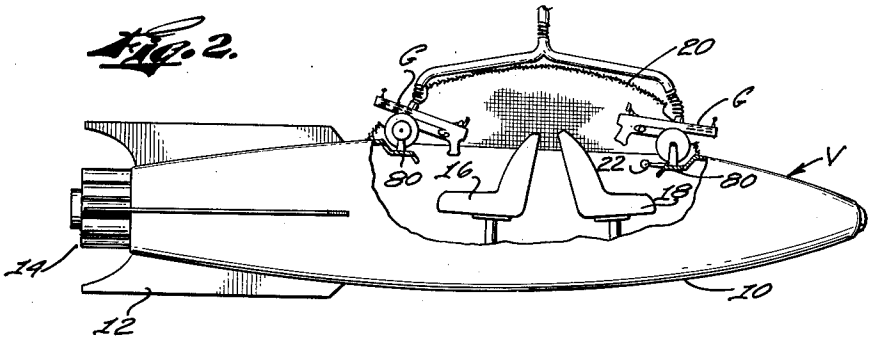


Fig. 3.

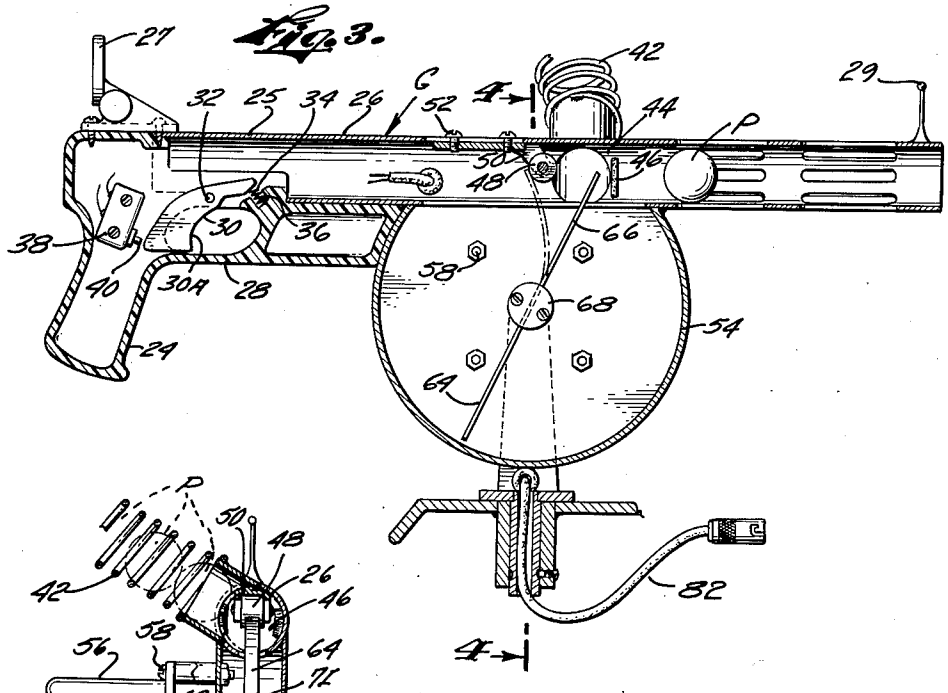
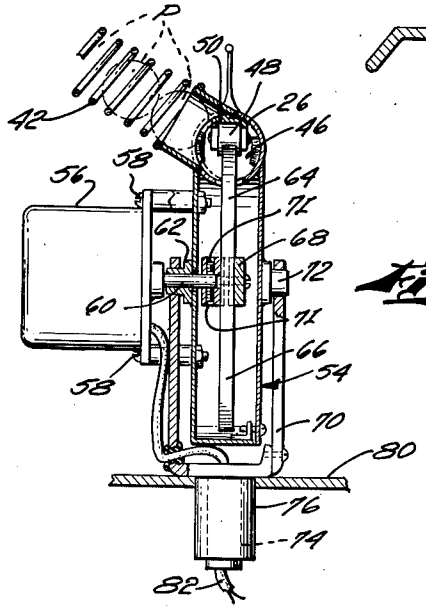


Fig. 4.



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4 Claims. (Cl. 272—36)

The present invention relates generally to the field of amusement devices and more particularly to an amusement device wherein passenger-carrying vehicles, equipped to shoot harmless projectiles, are operated under the limited control of passengers.

It is a major object of the present invention to provide an amusement device which includes a number of vehicles to accommodate passengers, which vehicles are operated under the restricted control of a passenger therein and wherein the vehicles incorporate gun means for shooting harmless projectiles at other vehicles or selected targets.

Another object of the present invention is to provide an amusement apparatus wherein harmless projectiles are shot from vehicles and wherein the projectiles are automatically circulated to be shot over and over.

Still another object of the present invention is to provide an amusement apparatus wherein passengers control vehicles from which they shoot harmless projectiles at selected targets.

A further object of the present invention is to provide a gun means for use as an amusement device wherein harmless projectiles are shot in rapid succession.

Still a further object of the present invention is to provide a toy gun which may be inexpensively manufactured and which is capable of propelling projectiles in rapid sequence.

These and other objects and advantages of the present invention will become more apparent from the following detailed description, when taken in conjunction with the appended drawings, wherein:

FIGURE 1 is a perspective and sectional view of an illustrative amusement apparatus constructed in accordance with the present invention;

FIGURE 2 is a vertical sectional view taken along line 2—2 of FIGURE 1;

FIGURE 3 is a sectional view of a gun incorporated in the apparatus of FIGURE 1; and

FIGURE 4 is a vertical sectional view taken along line 4—4 of FIGURE 3.

Referring to the drawings and particularly to FIGURE 1 thereof, the apparatus embodying the present invention is shown to include passenger-carrying vehicles V which are moved in a circular pattern by a motive means M. The vehicles V are capable of assuming various levels under control of the passenger therein as will be described hereinafter. Furthermore, the vehicles V are each equipped with a gun G for propelling projectiles P. The gun G is operated under the control of a passenger in a vehicle and may be pointed at various targets including other of the vehicles V. The projectiles P eventually fall to the bottom of the apparatus and are carried by a conveyor system C to a reservoir from which they are dispensed to be repeatedly shot by the gun G.

Considering the vehicles V of FIGURE 1 in greater detail, reference will now be had to FIGURE 2. The vehicles V include a streamlined body 10 formed to simulate a rocket or other aircraft. Fins 12 are mounted to radiate from the rear of the body 10 and jet tubes 14 extend from the back of the body thereby further providing a rocket appearance for the vehicle V.

The body 10 contains back-to-back seats 16 and 18 mounted in a cockpit. The seats may be mounted to turn and are equipped with safety belts (not shown). The cockpit of the vehicle V is covered by a transparent canopy 20 which may be formed of screen or other durable material capable of withstanding repeated bombardment by the projectiles P.

The seat 18 faces a control level 22 which serves to control the horizontal position of the vehicle V as will be described hereinafter. Mounted in front of each of the seats 16 and 18 is a gun G which extends through the canopy 20. The gun G shoots the projectiles P which may be small balls formed of cork or may alternatively be made of plastic or various other light materials.

Considering the guns G in detail, reference will now be had to FIGURES 3 and 4. The gun G includes a handle 24 integrally-formed with an elongate barrel 26 in somewhat of a pistol configuration. The handle 24 and barrel 26 may be formed of rigid plastic, metal or various other materials and may be cast in the form shown as an example. Sights 27 and 29 are mounted on the top of the barrel 26 to assist in aiming the gun G. A trigger guard 28 is provided below the barrel 26 adjacent the handle 24 and contains a trigger 30 which is pivotally-mounted by means of a pin 32 supported in the casting of the gun G. A coil spring 34 is engaged by the upper part of the trigger 30 and contained in a bore 36 adjacent the trigger guard 28. The spring 34 urges the lower part 30A of the trigger 30 forward.

An electrical switch 38 is mounted in handle 24 of the gun and includes a plunger 40 which is depressed when the lower part 30A of the trigger 30 is pulled rearwardly. The switch 38 may comprise a limited-movement single-pole single-throw switch which is normally opened but which is closed upon depression of the plunger 40 to thereby operate the gun G as will be described hereinafter.

The projectiles enter the gun G through a spring section 42 to enter a chamber 44 bounded by the walls of the barrel 26, pads 46 and a stop roller 48. The pads 46 may be formed of various resilient-deformable materials as rubber and serve to prevent the projectiles P from leaving the barrel 26 except when impelled therethrough. The roller 48 is mounted rearward of the chamber 44 on a bracket 50 affixed to the top of the barrel by screws 52.

A cylindrical housing 54 is provided at the bottom of the barrel 26 and may be integrally-formed therewith. A motor 56 (FIG. 4) is affixed on the side of the housing 54 by bolts 58 so that the shaft 60 of the motor extends through a bearing shaft 62 into the housing 54. Inside the housing 54, leaf springs 64 and 66 (FIG. 3) are affixed to extend radially from the shaft 60 by a coupling 68. The leaf springs are revolved by the motor 56 to cyclically pass through the chamber 44 after being flexed by engagement with the roller 48. Therefore, the springs 64 and 66 enter the chamber 44 with a snap, striking a projectile and propelling the projectiles through the barrel 26 with considerable force. Of course, the momentum of the projectiles P is relatively small in view of their light weight.

The gun G is supported by an upward extending U-shaped mounting bracket 70 (FIG. 4) the extremities of which pivotally receive support shafts 62 and 72 coaxially affixed to the cylindrical housing 54. Thus, the gun G may be easily tilted to various horizontal angles. The shaft 62 passes the shaft 60 of the motor therethrough to engage the coupling 68 by set screws 71.

The U-shaped bracket 70 terminates in a cylindrical section 74 at the bottom thereof, which is telescopically received in a bearing 76 supported on a mounting panel 80 in the cockpit of the vehicle V. The cylindrical section 74 is free to turn within the bearing 76 thereby enabling the gun to be turned to various positions. The motor 56 is energized through a cord 82 which extends through the cylindrical section 74 to be connected to a source of electrical energy.

In the operation of the gun G, the motor **56** is energized upon closure of the switch **38** by pulling the trigger **30**, thereby revolving the leaf springs **64** and **66** radially within the housing **54**. As the leaf springs **64** and **66** approach the projectile-containing chamber **44**, they engage the roller **48** and are flexed by the further movement of the motor **56**. After the springs are flexed to a predetermined degree, they pass under the roller **48** and snap into the chamber **44** to propel a projectile P through the barrel **26**. Upon the propelling of one projectile P another projectile enters the chamber through the section **42**, and is ready to be propelled by the next spring to enter the chamber **44**. Thus it can be seen that the guns G shoot projectiles in rapid sequence, with considerable speed.

Considering the integrated system, including a plurality of the vehicles V, reference will again be made to FIGURE 1. The vehicles V are supported upon beams **100** pivotally-mounted at the base of a column **102** for vertical movement. The column **102** will normally be formed of steel and is affixed as by welding to a base **104** which has a plurality of thrust bearing rollers **106** affixed at the lower, outer edge thereof to engage a bearing race or track **108**. The track **108** is supported upon a structure **110** which may be variously formed of rigid members as steel sections. The support structure **110** also incorporates a horizontally-mounted stabilizing bearing **112** which receives a shaft **114** extending from the bottom of the column **102**. The shaft **114** is coupled to a motor **116** mounted in the structure **110** by means of a gear train generally indicated at **118**.

The column **102** also carries slip rings **120** which are contacted by electrical contacts **122** adapted to be connected to a source of electrical energy. The contacts **122** and the slip rings **120** are individually connected to electrical conductors which extend through the column **102** and the beams **100** into the vehicles V to provide electrical energy to the motors therein which serve to operate the guns G.

The beams **100** are pivotally attached to the column **102** by pins **123** to enable the beams **100** to be positioned at various angles with respect to the column **102**. A hydraulic actuator **124** is connected between each of the beams **100** and the column **102**. The actuator is hydraulically connected to a source of hydraulic fluid or air and is controlled by the control lever **22** mounted in an associated vehicle V whereby to variously position the beam **100** with respect to the column **102** in accordance with well known techniques. For example, raising the control lever **22** may serve to extend the actuator **124** whereby to elevate the beam **100** and the vehicle V. Similarly, depressing the control lever **22** may serve to lower the vehicle V.

The column **102** is covered by a generally-cylindrical housing **126** which terminates at a deck **128**. The deck **128** is formed in a very flat cone so that projectiles P falling thereon roll to a funnel-like central section **130**. An electrical motor **132** is mounted at the bottom of the funnel-like section **130** and drives a conveyor **134** which may comprise a screw **136** in a tube **138**. Therefore, projectiles rolling into the funnel-like section **130** are carried by the conveyor C upward to a reservoir **140** located above the column **102** which is above the highest point attainable by the vehicles V.

The reservoir **140** is connected to each of the guns G by a variable-length perforated tube **142** which may comprise a plurality of sections telescopically fitted together to allow the vehicles V to move to various positions relative to the reservoir **140**. A vibrator **144** is mounted at each of the exits from the reservoir **140** to prevent the projectiles P from clogging at the entry to the tubes.

The entire moving apparatus of FIGURE 1 is covered by an enclosure **146** which may be formed of screen, or various other materials. The lower portion **146A** of the enclosure **146** is transparent and lies adjacent a catwalk **148** upon which spectators may stand to view the moving apparatus within the enclosure **146**. The ceiling portion **146B** of the enclosure has ultraviolet or black lights **150** mounted thereon to illuminate the interior of the enclosure with the ultraviolet radiation. The projectiles P and the vehicles V are painted with luminescent material and therefore fluoresces under the light from lights **150**.

In the operation of the system constructed in accordance with the present invention, passengers are seated in the seats **16** and **18** in the vehicles V. The motor **116** is then energized causing the column **102** to revolve along with the supporting base **104** and the housing **126**. As the column **102** turns, the column **100** carrying the vehicles V is revolved through a circular pattern. Of course, the passengers in the vehicles V may variously position the control levers **22** in order to set the hydraulic actuator **124** at various lengths and thereby simulate dives and climbs for the vehicles V.

While operating the lever **22** to simulate flight of the vehicles V, within a restricted pattern of movement, the passengers may also operate a gun G to propel projectiles P either at other of the vehicles V, spectators on the catwalk **148** or other targets which may be mounted inside the enclosure **146**. As a result, considerable entertainment is provided for the passengers in the vehicles V as well as the spectators standing on the catwalk **148**.

It is to be noted, that the projectiles P possess relatively little momentum in view of their light weight and therefore upon striking the canopy **20** or the enclosure **146**, the projectiles become dead or expired and fall to the deck **128** without harming the equipment or the passengers.

Upon falling to the deck **128**, the projectiles roll to the central section **130** to be carried by the conveyor C back to the reservoir **140**. Of course, the reservoir **140** is well stocked with projectiles P so that each of the tubes **142** leading to the vehicles V are always filled with projectiles to which are continuously provided the guns G.

An important feature of the present invention resides in the structure of the guns G wherein harmless projectiles are propelled by a relatively simple structure which may be economically constructed.

Another important feature of the present invention resides in the composite amusement apparatus which provides considerable activity as well as an entertaining challenge to passengers placed in the vehicles V.

Various modifications and changes may be made with respect to the foregoing description without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. An amusement apparatus wherein harmless projectiles are propelled at various targets, comprising: a base; a plurality of passenger-carrying vehicles; structural means interconnecting said base and each of said vehicles whereby said vehicles are movable in a limited pattern; gun means affixed to said vehicles to propel said projectiles; an enclosure substantially covering said vehicles to restrict said projectiles to the area encompassed by said enclosure, said enclosure including a deck sloped to a central area; and conveyor means for receiving at said area projectiles shot from said gun means and transporting said projectiles back to said gun means, said conveyor means including a reservoir mounted above said vehicles, means for raising expired projectiles to said reservoir and a tube for carrying said projectiles from said reservoir to said gun means.

2. Apparatus according to claim 1 wherein said projectiles are phosphorescent under ultraviolet light, and said apparatus includes means to illuminate the interior of said enclosure with ultraviolet light.

3. An amusement apparatus wherein harmless projectiles are propelled at various targets, comprising: a base; a vertical column rotatably supported on said base; a

plurality of beams extending radially outwardly from said column with each of said beams having its radially inner end pivotally connected to said column; first power-operated means to rotate said column; second power-operated means to vary the angular position in a vertical direction of said beams relative to said column; a plurality of passenger-carrying vehicles, each of said vehicles being supported at the radially outer end of one of said beams whereby said vehicles are movable in a limited pattern; gun means affixed to said vehicles to propel said projectiles; an enclosure substantially covering said vehicles to restrict said projectiles to the area encompassed by said enclosure, said enclosure including a deck sloped to a central area; and conveyor means for receiving at said area projectiles shot from said gun means and transporting said projectiles back to said gun means, said conveyor means including a reservoir mounted above said vehicles, means for raising expired projectiles to said reservoir and a tube for carrying said projectiles from said reservoir to said gun means.

4. Apparatus according to claim 3 wherein said projectiles are phosphorescent under ultraviolet light, and said apparatus includes means to illuminate the interior of said enclosure with ultraviolet light.

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