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McKay et al.

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[45] **Sept. 30, 1975**

[54] **SHIFT CONSOLE INCLUDING MEANS FOR FEEDING AND LAUNCHING VEHICLES**

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[73] Assignee: **Marvin Glass & Associates**, Chicago, Ill.

[22] Filed: **July 15, 1974**

[21] Appl. No.: **488,301**

Related U.S. Application Data

[63] Continuation of Ser. No. 302,251, Oct. 30, 1972, abandoned.

[52] **U.S. Cl.** ..... **46/1 K**; 273/129

[51] **Int. Cl.**[2] **A63H 17/00**

[58] **Field of Search** ..... 46/1 K, 202, 206, 81; 273/129

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Primary Examiner—F. Barry Shay

Attorney, Agent, or Firm—Coffee & Sweeney

[57] **ABSTRACT**

A toy vehicle launching assembly including a launching station having a plunger-like launcher member for striking and launching a vehicle positioned at said station, a simulated gear shift lever connected with said plunger for cocking and releasing the same, said shift lever also being associated with sound mechanism for producing sound during movement of said shift lever through simulated shifting positions.

9 Claims, 12 Drawing Figures

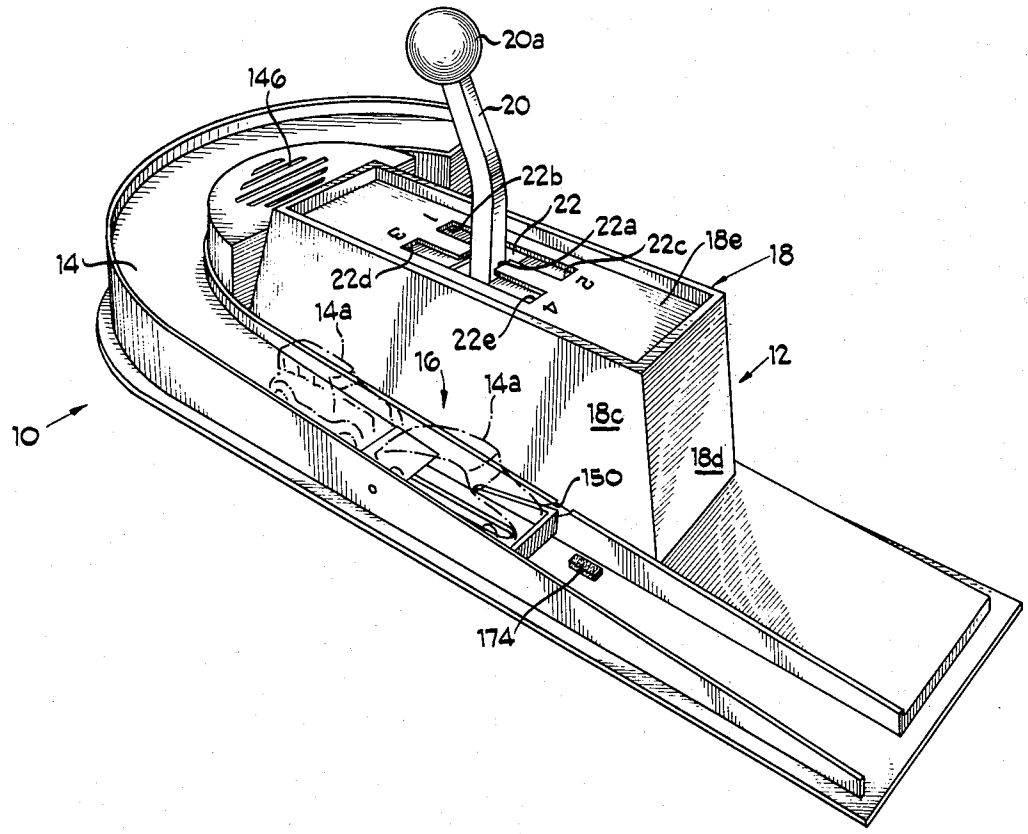


Fig 1

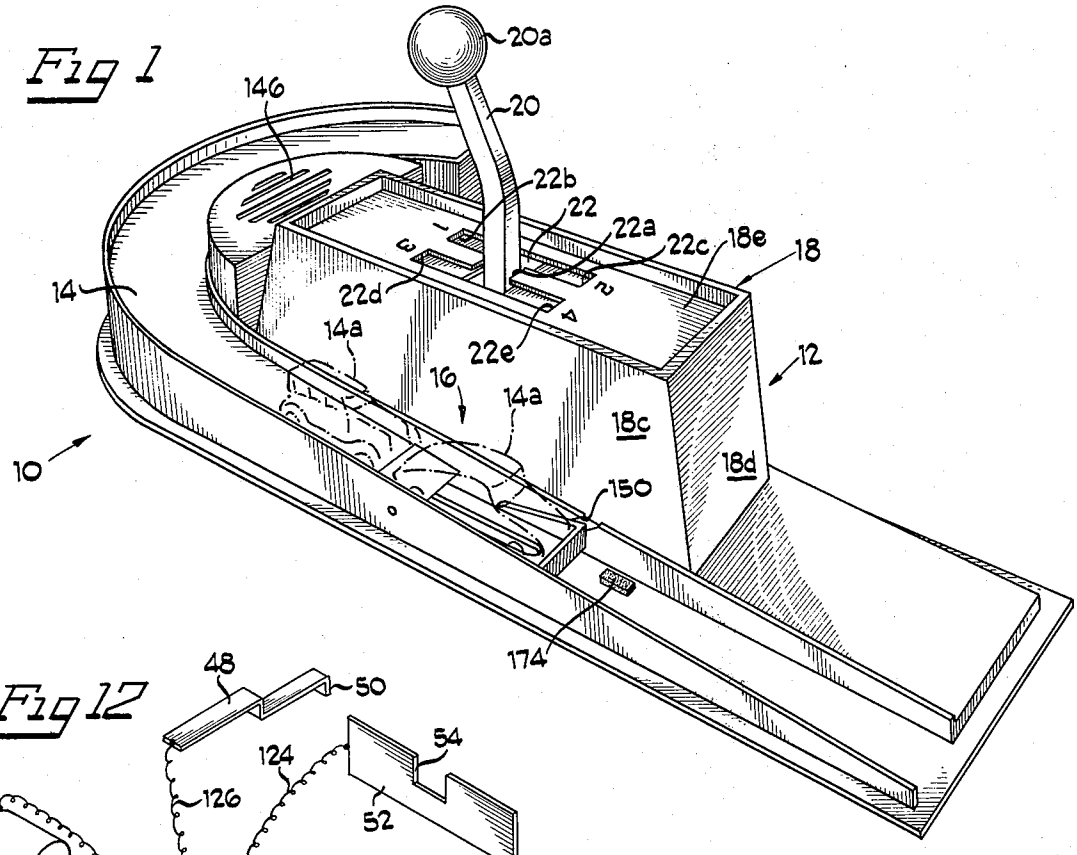
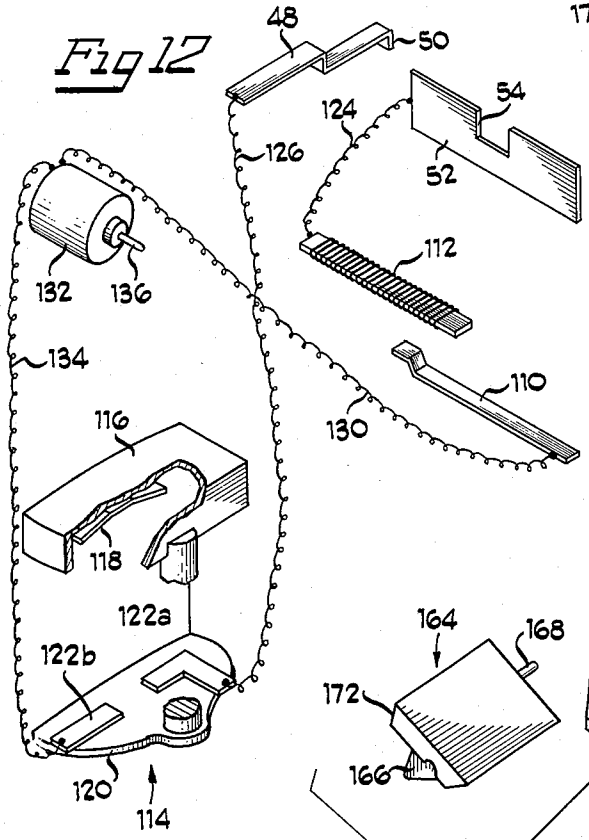
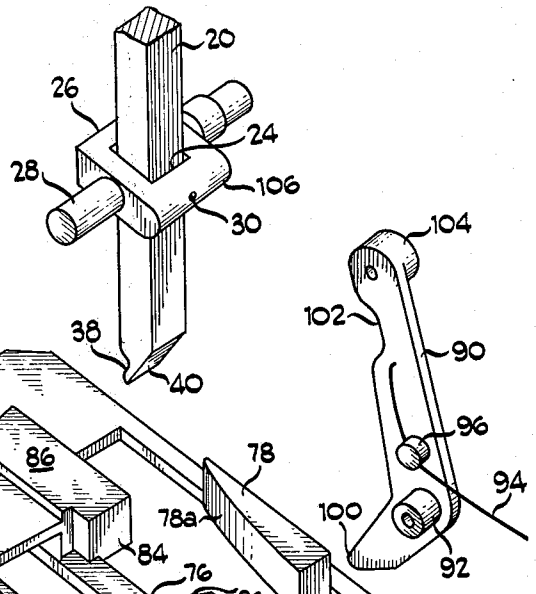


Fig 12





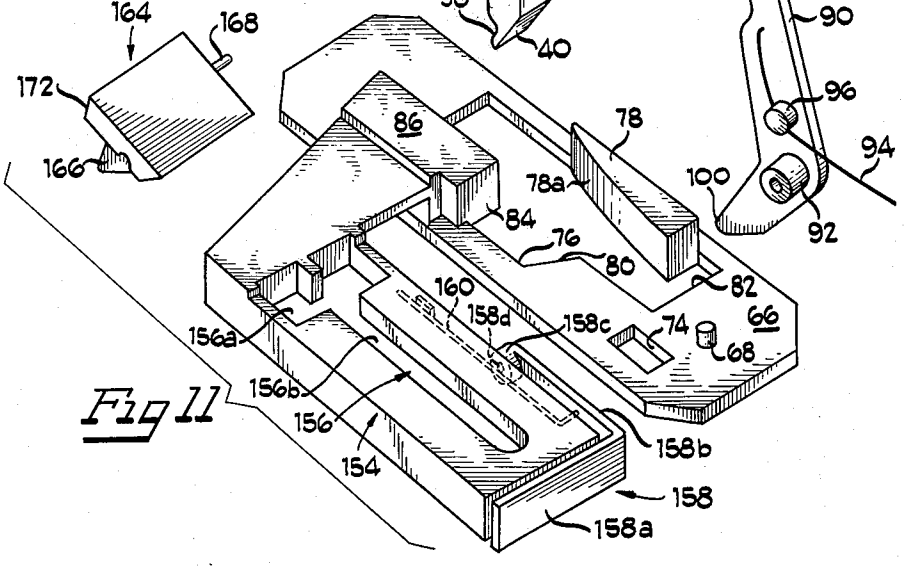


Fig 11

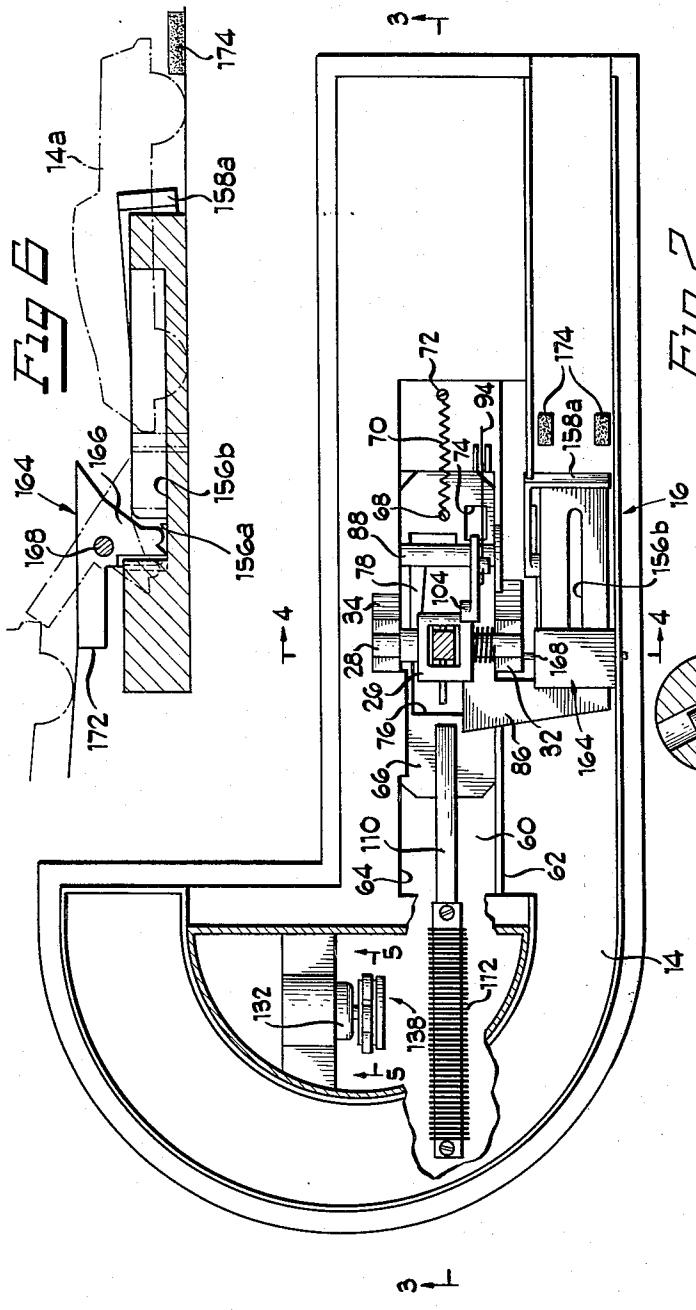


Fig 6

Fig 2

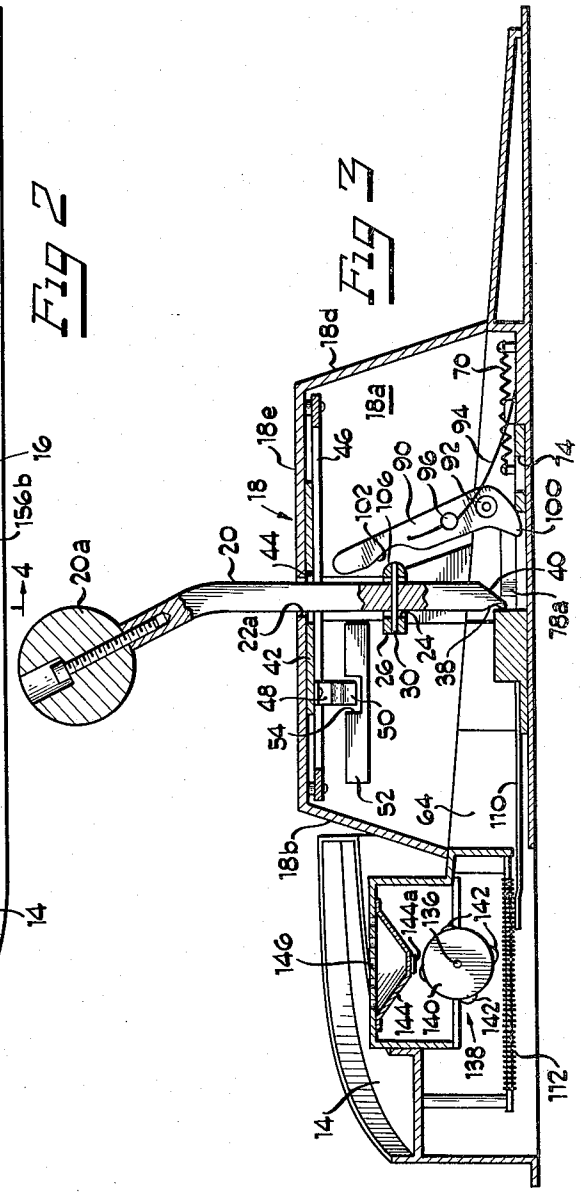


Fig 3

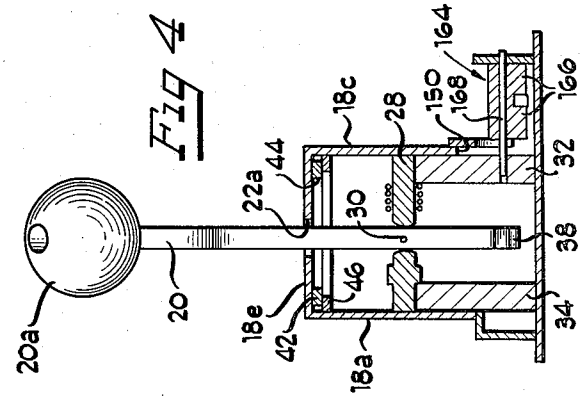


Fig 4

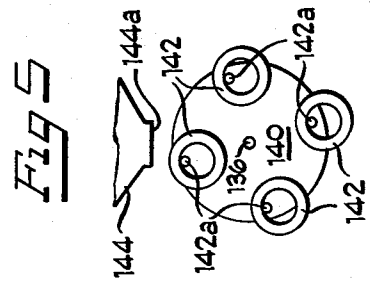


Fig 5

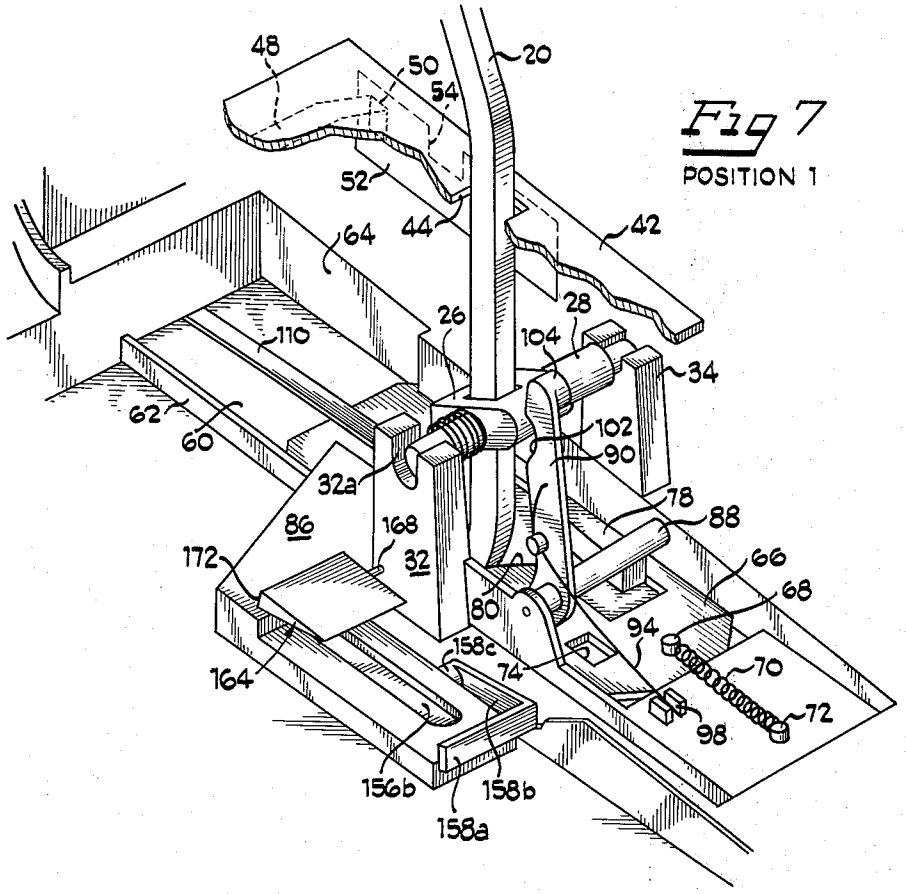


Fig 7
POSITION 1

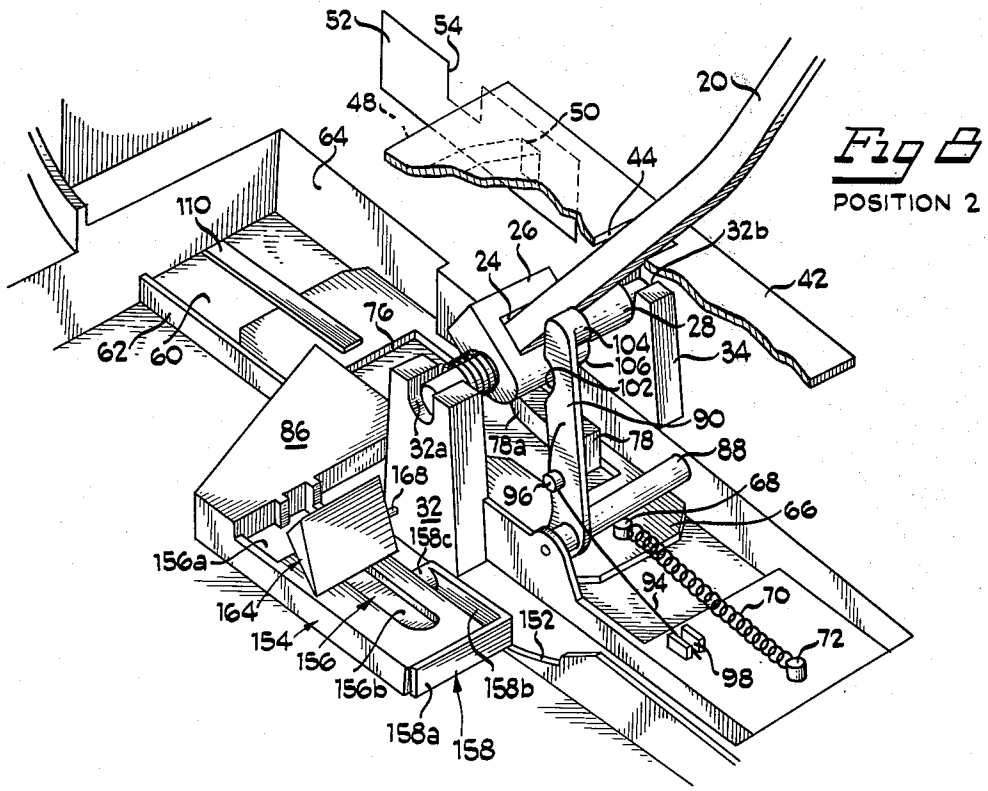


Fig 8
POSITION 2

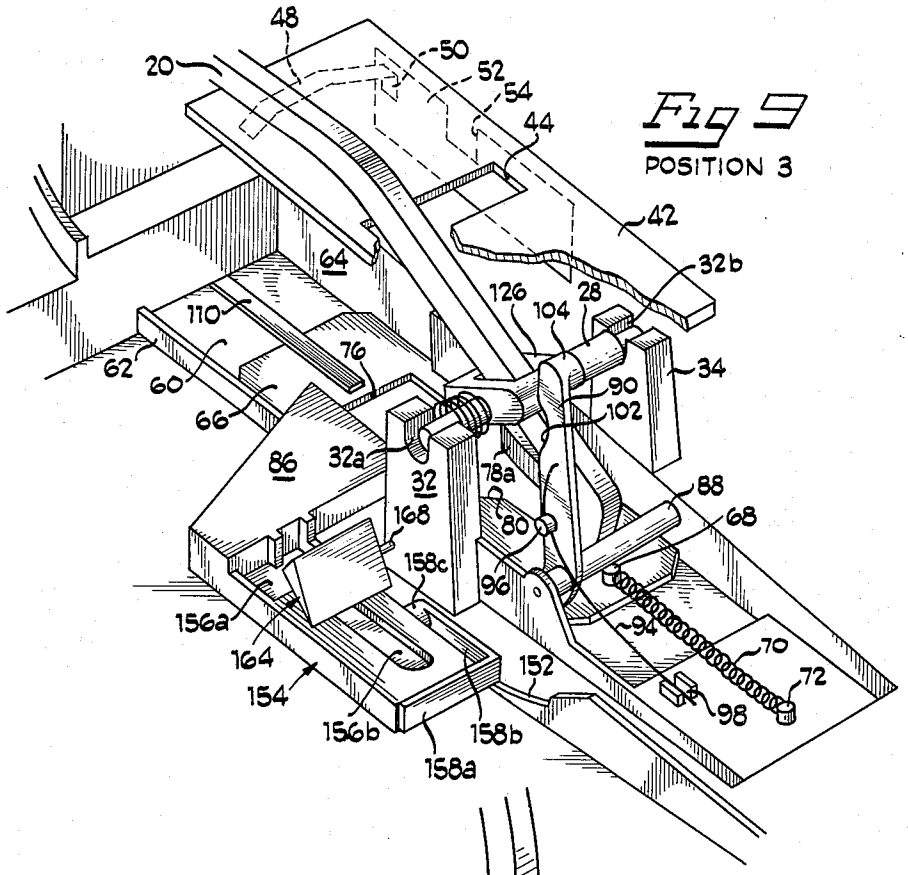


Fig 9
POSITION 3

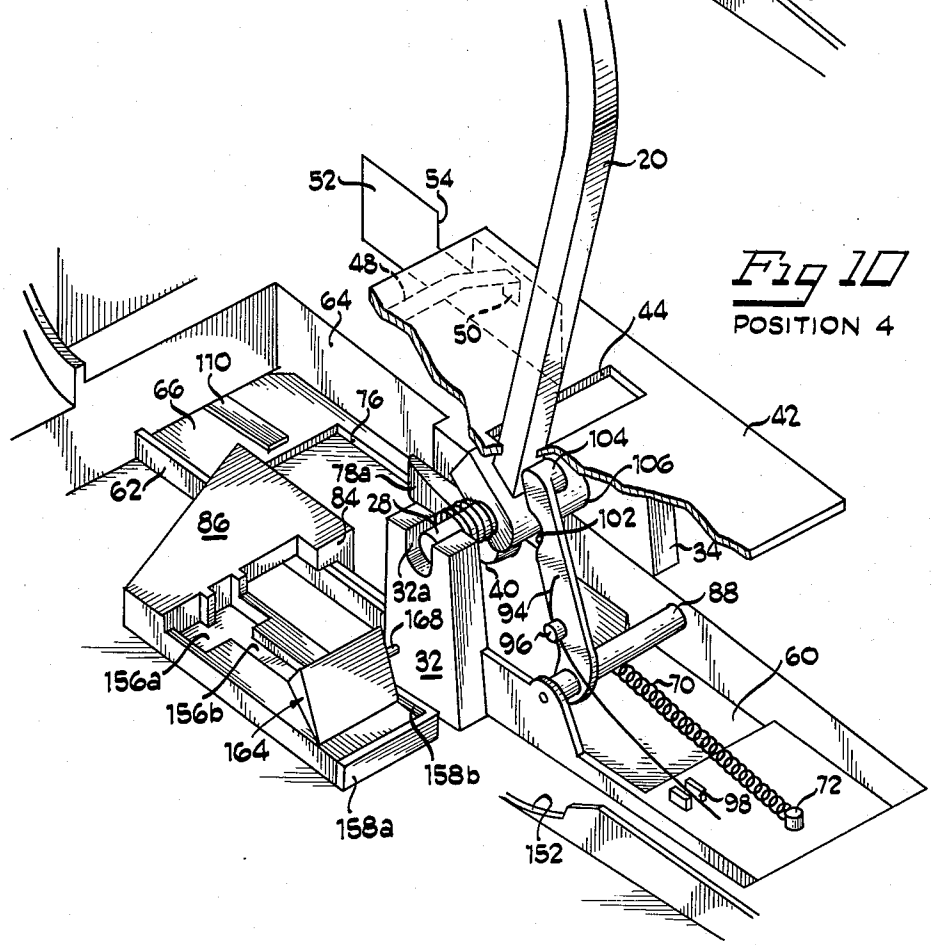


Fig 10
POSITION 4

SHIFT CONSOLE INCLUDING MEANS FOR FEEDING AND LAUNCHING VEHICLES

CROSS REFERENCET TO OTHER APPLICATIONS

This is a continuation of application Ser. No. 302,251, filed Oct. 30, 1972 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to toy vehicles and launching devices therefor, such as presently classified in Class 46, subclass 202 and 206.

2. Brief Description of the Prior Art

The art abounds with prior patents relating to an accelerator or launching apparatus for toy vehicles. Examples of such U.S. Pat. Nos. are as follows:

Generally speaking, the art shows several examples of structures for either initially propelling, or accelerating, a toy car along a path of travel. These devices are particularly well received as accessories for use with toy car track layouts and also for use with different forms of toy cars. Accordingly, it is the object of this invention to provide an improved form of a toy car launching device for use in launching toy cars in a path of travel.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision of an improved launching device for a toy vehicle.

The best mode currently contemplated for carrying out the invention includes a housing defining an arcuate toy vehicle feeding ramp terminating in a launching station having a reciprocable plunger thereat. A gear shift handle extends upwardly through the housing and is mounted for movement in a generally H shaped pattern between a simulated "neutral" mode and four gear shift positions. The shift lever is associated with circuitry for acutating sound producing mechanism during movement of the shift lever through the four shift positions. In addition, the shift lever is associated with launching plunger cocking mechanism for moving the launching plunger to a retracted stressed state, and then rapidly releasing the plunger to launch a vehicle at the launching station, with said stressing and releasing functions being accomplished also as said shift lever moves through the simulated shift pattern.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the toy vehicle launching device of this invention;

FIG. 2 is a top plan view of the toy vehicle launching device of this invention, with a portion broken away for clarity of illustration;

FIG. 3 is a section view taken generally along the lines 3—3 of FIG. 2;

FIG. 4 is a section view taken generally along the lines 4—4 of FIG. 2.

FIG. 5 is a section view taken generally along the lines 5—5 of FIG. 2;

FIG. 6 is an enlarged section view of a portion of the launching station of the toy vehicle launching device of this invention;

FIG. 7 is a fragmentary perspective view of a portion of the toy vehicle launching device of this invention showing the shift lever in a first gear position;

FIG. 8 is a view similar to FIG. 7 showing the shift lever in a second gear position;

FIG. 9 is a view similar to FIGS. 7 and 8 showing the shift lever in a third gear position;

FIG. 10 is a view similar to FIGS. 7, 8, and 9, showing the shift lever in a fourth gear position;

FIG. 11 is an exploded view of components on the shift assembly; and

FIG. 12 is a fragmentary exploded view of components of the circuitry for actuating the sound producing mechanism.

While this invention is suscpetible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a specific embodiment therefor, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the toy vehicle launching device 10 of this invention includes a housing 12, preferably made of a generally rigid molded plastic or a similar substance. The housing 12 includes a generally arcuate, downwardly inclined, launching ramp 14 for receiving and guiding toy vehicles 14*a* towards a launching station, generally indicated 16.

The housing 12 includes a shift console generally indicated 18 comprising upright walls 18*a*, 18*b*, 18*c*, 18*d* and top panel 18*e*. Shift stick 20 extends through a generally H-shaped slot in the top of console 18 and is provided with a grasping knob 20*a* at its exterior end. Slot 22 includes the medial or neutral position 22*a* at the cross slot of the H, a simulated first gear position 22*b* at one end of one leg of the H, a simulated second gear position 22*c* at the opposite end of the one leg, a simulated third gear position 22*d* at one end of the other leg of the H, and a simulated fourth gear position 22*e* at the opposite end of the other leg of the H.

Shift stick 20 extends through the opening 24 in a generally rectangular enlargement 26 which is an integral part of mounting shaft 28. A suitable pin-like fastener or set screw fastener 30 extends through the enlargement 26 and the shift stick 20 to mount the stick for limited pivotal movement about a horizontal axis relative to the opening 24 transverse to the axis of the shaft 28. The shaft 28 is received in recesses 32*a* and 32*b* of spaced apart uprights 32 and 34, respectively, within shift console 18, to mount the shaft 28 for to and fro pivotal movement about a horizontal axis which is generally transverse to the axis of the fastener or set screw 30. By this arrangement, stick 20 may move in transversely oriented directions to traverse the H shaped slot 22.

Shift stick 20 terminates in a generally hooked end 38 having an opposite beveled face 40. The shift stick 20 extends through a slide plate 42 which closely underlies top 18*e* and, particularly, through the laterally elongated slot 44, with the slot 44 intended to underlie the generally transverse section 22*a* of the H shaped slot 22. The slide plate 42 is retained adjacent the underside of the top panel 18*e* of console 18 by means of slide bracket 46 which thereby permits to and fro movement of the plate 42 responsive to related movement of stick 20.

The slide plate 42 supports a wiper arm 48 which extends laterally outwardly from the underside thereof and terminates in a depending finger 50 which is in-

tended to slidingly engage the wiper plate **52** secured to the inside of the console wall **18***a*. Preferably, plate **52** has a notch **54** therein to provide an interruption in the contact between the finger **50** if wiper arm **48** and the plate **52.** It is intended that when stick **20** is in the neutral position (slot portion **22***a*), the finger **50** of wiper arm **48** would be aligned with notch **54** of wiper plate **52.**

An opening **60** is provided in the bottom of shift console **18** and is bordered by a rail **62** along one side thereof and side wall **64** along the other side thereof, with the opening **60** defining a slot or channel in which the cocking plate **66** is mounted for to and fro movement responsive to movement to the shift lever **20.** Cocking plate **66** includes an upstanding post **68** to which one end of spring **70** is fastened, with the other end of spring **70** being fastened to a post **72** on housing **12** to thereby bias cocking plate **66** to forward, or release, position relative to the console **18,** the housing **12** and the opening or slot **60.** A small notch or recess **74** is formed in the top of cocking plate **66** near the forward end thereof and the cocking plate **66** further includes an enlarged opening or recess **76,** generally centrally formed therein which is occupied by end **38** of shift stick **20.** Recess or opening **76** is substantially rectangular in configuration but is provided with a generally wedge shaped guide nose **78** near the forward end, with the guide nose **78** specifically having a forwardly and inwardly directed guide surface **78***a* which is intended to abut and guide the lower end **38** of shift stick **20.** In addition, the opposite side wall **80** of the opening **76** is also forwardly and inwardly inclined opposite the surface **78***a* to direct the lower or free end of shift stick **20** toward the narrowed forward end **82** of opening **76.**

A vertical surface extends laterally into the recess **76** and is part of a cantilever arm **86** secured to the cocking plate **66** which supports launching components at the launching station **16.** The vertical surface **84** is intended to engage the end **38** of stick shift **20** to assist in moving the cocking plate **66** within the opening **60.**

A retaining arm **90** is mounted in the interior of console **18** and includes a hub **92** which is pivoted on shaft **88** which extends across rail **62** and wall **64.** A wire spring **94** extends through a post **96** on arm **90** and is received in slots **98** in housing **12** and therefore biases the arm **90** downwardly with the reduced nose **100** bearing downwardly and forwardly relative to the recess **74** in the cocking plate **66** to assist in retaining the cocking plate in a retracted or stressed condition or position. The upper end of arm **90** is notched at **102** in the area generally opposite the enlargement **24** through which stick shift **20** extends. The upper end terminates in a rounded hub **104** which is intended to generally bear against the shift stick and may be displaced by the rounded face **106** of the enlargement **26** to overcome the biasing or urging force of spring **94** and lift the reduced nose **100** from the recess or notch **74.**

The cocking plate **66** is provided with a leaf metal rear extension **110** which is secured to the top thereof and extends therefrom to slidably engage a resistor winding **112** as shown in FIGS. **2** and **3.** The extension **110** wipes against the resistor winding **112** to thereby provide a variable resistor as the cocking plate **66** is moved to and fro. Batteries for providing power are held in the battery housing **114.** Battery housing **114** includes an upper contact **118;** and a first lower contact **122***a*, and a second lower contact **122***b*. Wire **124** extends from resistor winding **112** to the plate **52** and wire **126** extends from the wiper arm **48** to the "on-off" switch **114** and, particularly, to the contact **122***a*. Wire **130** extends from the leaf metal extension **110** to the motor **132** and wire **134** extends from the motor **132** to the housing **114** and, particularly, to the contact **122***b* thereof. Thus, as the shift stick **20** is moved, the plate **42** will be displaced to move the wiper arm **48** into engagement with, and along, plate **52** and the leaf metal contact **110** will move along the resistor winding **112** to complete a circuit of variable output which will activate the motor **132** and, particularly, the output shaft **136** thereof.

Motor output shaft **136** has a first audible signal producing member **138** mounted thereon. Member **138** is comprised of a pair of spaced apart discs **140** having a plurality of pins **142***a* extending therebetween in the area of the periphery for loosely mounting the rings **142.** The disc **140** is adjacent the base **144***a* of speaker cone **144** which underlies speaker grille **146.** As the motor shaft **136** is rotated, the rings **142** will tend to fly outwardly relative to the pins **142***a* responsive to centrifugal force, and repeatedly strike the base **144***a* of the cone **144,** producing an audible noise, preferably simulating that of an automobile being rapidly accelerated.

An elongate slot **150** is formed in the shift control housing **18** and specifically in wall **18***c* adjacent to the track **14.** The forward end of the slot **150** defines an upwardly curved, offset, guide surface **152.** Arm **86** extends through slot **150** and supports a plunger **154** which substantially occupies track **14** at the launching station **16** and is movable to and fro in the track.

Plunger **156** has a generally T shaped slot therein, including a first transverse portion **156***a* and a second elongate portion **156***b*. The plunger **154** supports a front gate **158** which is generally L shaped and has a forward restraining portion **158***a*, a rearward portion **158***b* and a mounting hub portion **158***c*, with a pin **158***d* by means of which the gate **158** is pivoted to the plunger. A wire spring **160** is connected to the gate **158** and to the plunger **154** to normally urge gate **158** downwardly in the retracted position as shown in FIGS. **9, 10,** and **11.** As plunger **156** moves, gate **158** tracks on notch **152** between a raised and lowered positon.

Plunger **154** also supports a rear gate **164** having a depending tongue **166** through which pin **168** extends and also into upright **32** to pivotally mount the rear gate **164** with respect to the housing **12** and plunger **154.** Rear gate **164** is movable between a horizontal, or open position, as shown in full outline in FIG. **6,** and an inclined or closed position as shown in dotted outline in FIG. **6.** The gate **164** includes a forward inclined edge to permit a movement of the gate to the closed position, and a rear surface **172** which is positioned to abut toy vehicles fed down the inclined ramp **14.** A supplementary stop means in the form of a small resilient pad **174** is positioned in the track **14** a short distance forward of the plunger **154.**

In operation, assuming shift stick **20** is in "neutral", the switch **114** is first activated and at least one, and preferably several, toy cars **14***a* are deposited on ramp **14.** The forwardmost car will roll to the launching station **16,** over the rear gate **164** and come to rest against the front gate **158.** As the shift stick **20** is moved to the first gear position **22***b*, thereby moving slide plate **42**

rearwardly, it will cause finger **50** of wiper arm **48** to bear against wiper plate **52,** completing the circuit for activation of the signal producing means. The shift stick **20** is next moved to the second gear position **22***c*, moving slide plate **42** forwardly and cocking plate **66** rearwardly. As plate **42** moves forwardly, wiper **48** remains in engagement with plate **52** and as plate **66** moves rearwardly, extension **110** moves relative to resistor winding **112** increasing the output of the signal producing means. In addition, the reduced nose **100** of arm **90** drops into recess **74** of the cocking plate. At the same time, rear gate **164** is moved into a closed position by the rearward movement of the plunger **154** (FIG. **6**). The plunger engages rear gate tongue **166** and pivots it as shown in phantom in FIG. **6.** Because plunger **154** is mounted as part of the cocking plate **66** and moves therewith, the movement of the shift stick **20** will move the cocking plate **66** which, in turn, will move the plunger. As described above, this movement of the plunger will pivot the rear gate **164.** When rear gate **164** is moved into the inclined or closed position, thereby holding the next successive toy vehicle **14**a from movement on the plunger and at the same time forcing the first toy vehicle **14***a* partially off the plunger. Next the shift stick **20** is moved to the third gear position **22***d* which only causes movement of the slide plate **42** in that the cocking plate **66** is held against movement by the restraining action imposed by arm **90.** Spring **70** remains in a stressed state and the lower or forward end of the shift stick moves into the notch **82.** Subsequently, stick **20** is moved to the fourth gear position **22***e* which again causes movement of the plate **42** and further causes movement of the cocking plate **66** rearwardly, increasing the stressing force of spring **70.** This also moves extension **110** for a further increment relative to resistor winding **112,** thereby changing the output of the motor **132** and increasing the moise of the signal producing member. In addition, the plunger **154** is also moved rearwardly in response to the rearward movement of the cocking plate **66** so that the toy vehicle **14***a* is dumped from the plunger on to the track **14.** As movement to the fourth gear position **22***e* is completed, the enlargement **24** engages hub **104** of arm **90** so that nose **100** is removed from recess **74,** thereby causing the cocking plate **66** and the plunger **154** to rapidly move forward responsive to the force imposed by stressed spring **70.** This rapid forward movement of the plunger will launch the vehicle **14***a* from the remaining chute portion of the track **14** and permit the next adjacent vehicle **14***a* to drop on top of the plunger.

Thus it can be seen that with the launching assembly of this invention, a participant may simulate the action of shifting a manual transmission through the different speed ranges thereof during which the audible signal producing circuit will be activated to impart a noise which is intended to simulate that of an automobile engine. As the participant shifts into the higher ranges, the output of the signal producing device is increased. At the same time, the plunger goes through a series of movements which first permits the occupation thereon of a toy vehicle and blocks access thereto of a next successive toy vehicle, following which the first toy vehicle is moved in front of the plunger so that, as the plunger moves rapidly forward responsive to the release of the retaining means from the spring urged cocking plate, the toy vehicle will be launched outwardly by reason of the engagement of the toy vehicle with the frontal gate of the plunger

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

We claim:

1. A toy vehicle launching device comprising:

means defining a shift console including a wall having an H-shaped slot formed therein;

a hand manipulatable shift stick received in said slot and movably mounted to said console for movement through said slot;

means defining a launching station for receiving a toy vehicle preparatory to launching;

launching means operably connected to said shift stick for launching a toy vehicle from the launching station in response to a predetermined sequence of shift stick movements in said slot, said launching means including a cocking plate movably mounted in said console and associated with said shift stick for movement in response thereto, said cocking plate being rapidly movable between an unbiased or released position to a biased or cocked position in response to the movement of the shift stick in said shift sequence, biasing means associated with said cocking plate for urging said cocking plate toward the released position, a plunger connected to said cocking plate extending outside of said console, said plunger propelling a toy vehicle from the launching station when said cocking plate is rapidly moved from a cocked position to a released position, retaining means operably associated between said cocking plate and said shift stick for holding said cocking plate in a cocked position before the completion of the shift movement sequence and for releasing said cocking plate at the end of said sequence thereby allowing said cocking plate to move rapidly between the cocked and released positions;

an inclined toy vehicle feeding track for holding a plurality of vehicles single file thereon adjacent the launching station; and

feeding means associated with said launching means intermediate said feeding track and said launching station for feeding the vehicles on the track to the launching station one at a time after the previous vehicle has been launched therefrom and wherein said feeding means includes a rear gate associated with said launching means for normally blocking the first vehicle on said track from moving to the launching station, said rear gate being movable in response to the actuation of said launching means between a normal raised position blocking said first vehicle and a lowered position allowing said first vehicle to move thereover toward said launching station, and a forward gate associated with said launching means for holding a toy vehicle between it and said rear gate on said launching station, said forward gate being movable in response to the actuation of said launching means between a normally lowered position wherein a vehicle can move thereover to the launching station and a raised blocking position wherein a vehicle is blocked from moving to the launching station, said foward gate being in its normal lowered position when said rear gate is in its normal raised position and said for-

ward gate being in its raised position when said rear gate is in its lowered position.

2. The device of claim **1** wherein said forward gate is mounted on said plunger for movement therewith and is normally biased downwardly and wherein said feeding track includes a cam guiding surface on which a portion of said forward gate tracks when said plunger is moved whereby said forward gate is moved between its raised and lowered positions.

3. The device of claim **1** wherein said rear gate includes a pivotally mounted surface member engaged with said plunger so that forward movement of said plunger will pivot said gate surface member from a closed position wherein the gate surface member is canted relative to said track to the open position wherein the gate surface member is continuous with said track.

4. A toy vehicle launching device comprising:

means defining a shift console having a hand manipulatable shift stick on said console;

means defining a launching station for receiving a toy vehicle preparatory to launching;

launching means operably connected to said shift stick for launching a toy vehicle from the launching station in response to predetermined shift stick movements, said launching means being movably mounted on said console and operatively associated with said shift stick for movement in response thereto, said launching means being movable between an unbiased or released position to a biased or cocked position in response to the movement of the shift stick, said launching means including biasing means for urging the launching means toward the released position to propel a toy vehicle from the launching station when said launching means is moved from the cocked position to a released position;

a toy vehicle feeding track for holding a plurality of vehicles single file thereon adjacent the launching station; and

feeding means associated with said launching means between said feeding track and said launching station for feeding the vehicles on the track to the launching station one at a time after the previous vehicle has been launched therefrom and wherein said feeding means includes means associated with said launching means for normally blocking the first vehicle on said track from moving to the launching station, said blocking means being movable in response to the actuation of said launching means between a position blocking said first vehicle and a position allowing said first vehicle to move toward said launching station.

5. The device of claim **4** wherein said shift console includes a wall having an H-shaped slot formed therein and wherein said shift stick is received in said slot and is movably mounted to said console for movement through said slot.

6. The device of claim **4** wherein said launching means includes a cocking plate movably mounted in said console and associated with said shift stick for movement in response thereto, said cocking plate being rapidly movable between an unbiased or released position and a biased or cocked position in response to the movement of the stick shift in said shift sequence, a plunger connected to said cocking plate extending outside of said console, said plunger propelling a toy vehicle from the launching station when said cocking plate is rapidly moved from its cocked position to its released position, and retaining means operably associated between said cocking plate and said shift stick for holding said cocking plate in its cocked position before the completion of the shift movement sequence and for releasing said cocking plate at the end of said sequence.

7. The device of claim **4** wherein said feeding track is inclined and said feeding means feeds the vehicle on the track due to the force of gravity.

8. The device of claim **7** wherein said blocking means includes a rear gate movable in response to the actuation of said launching means between a normal raised position blocking said first vehicle and a lowered position allowing said first vehicle to move thereover toward said launching station.

9. The device of claim **8** wherein said feeding means further includes a forward gate associated with said launching means for holding a toy vehicle between it and said rear gate on said launching station, said forward gate being movable in response to the actuation of said launching means between a normally lowered position wherein a vehicle can move thereover to the launching station and a raised blocking position wherein a vehicle is blocked from moving to the launching station, said forward gate being in its normal lowered position when said rear gate is in its normal raised position and said forward gate being in its raised position when said rear gate is in its lowered position.

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