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Glass et al.

[11] **3,797,164**

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[54] **TOY VEHICLE LAUNCHING STATION**

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[52] **U.S. Cl.** **46/232**, 46/175

[51] **Int. Cl.** **A63h 17/44**

[58] **Field of Search** 46/232, 202, 209, 215, 46/175

[56] **References Cited**

UNITED STATES PATENTS

2,050,892	8/1936	Marx	46/202 X
3,731,765	1/1956	Carver	46/209 X
3,600,850	8/1971	Summerfield	46/243 M
3,641,704	2/1972	Sims	46/243 L

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[57] **ABSTRACT**

A toy vehicle launching station configured to simulate a garage and having a pair of launching plungers movable between a retracted, cocked state and a released, extended state and a sound producing means in the form of a siren and associated with trigger means for activating the siren and releasing the plungers from a cocked state to launch a vehicle thereby.

8 Claims, 7 Drawing Figures

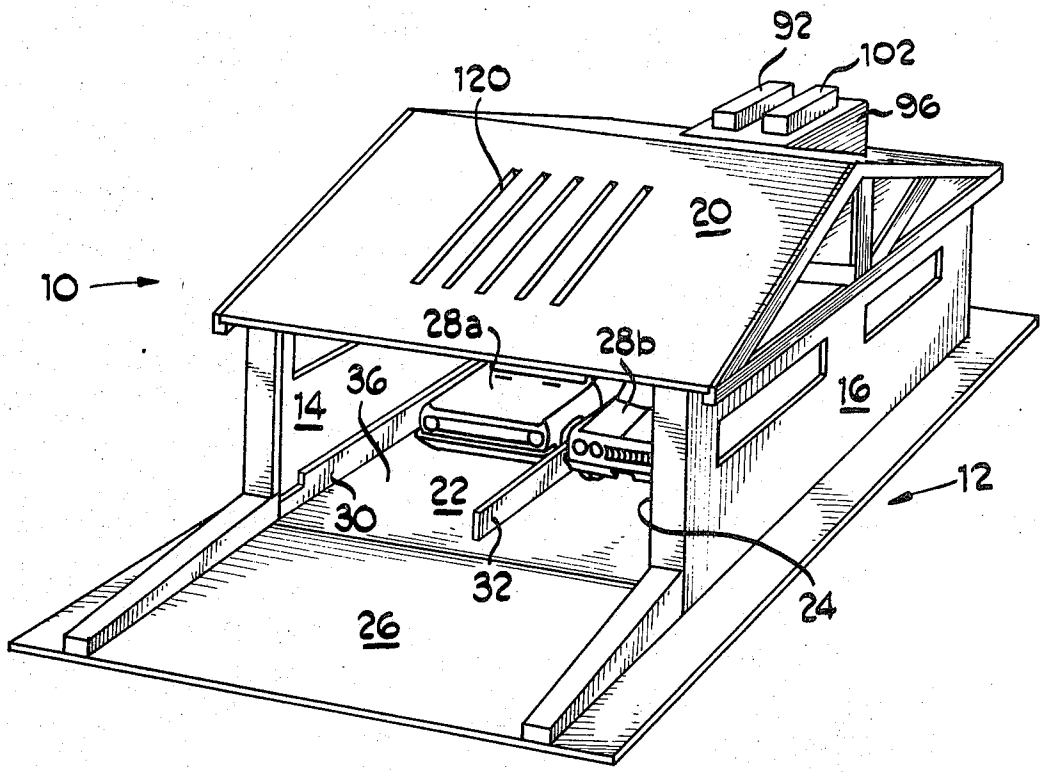


Fig 1

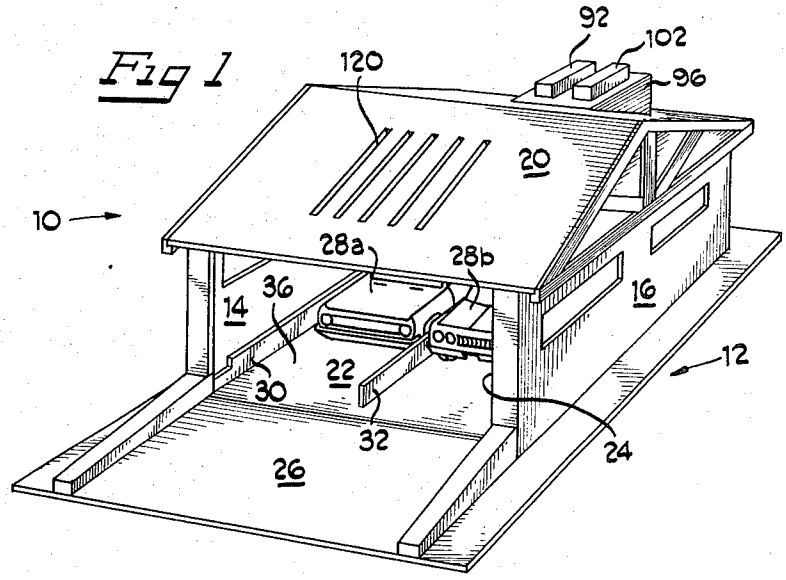


Fig 5

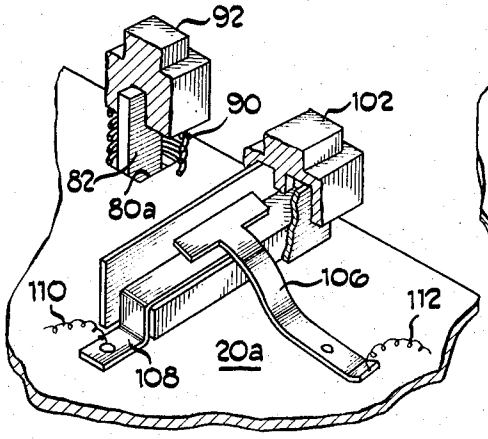
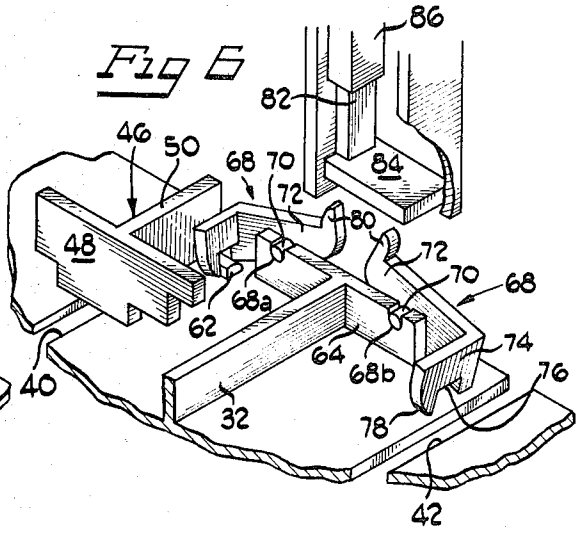


Fig 6



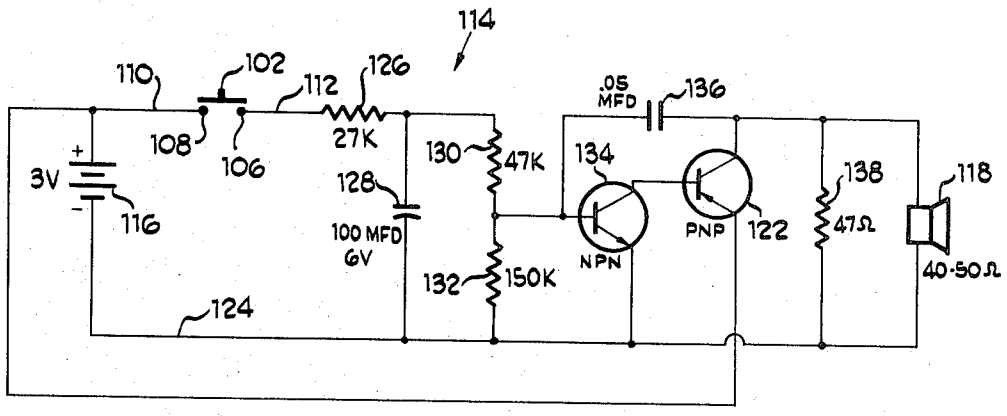


Fig 7

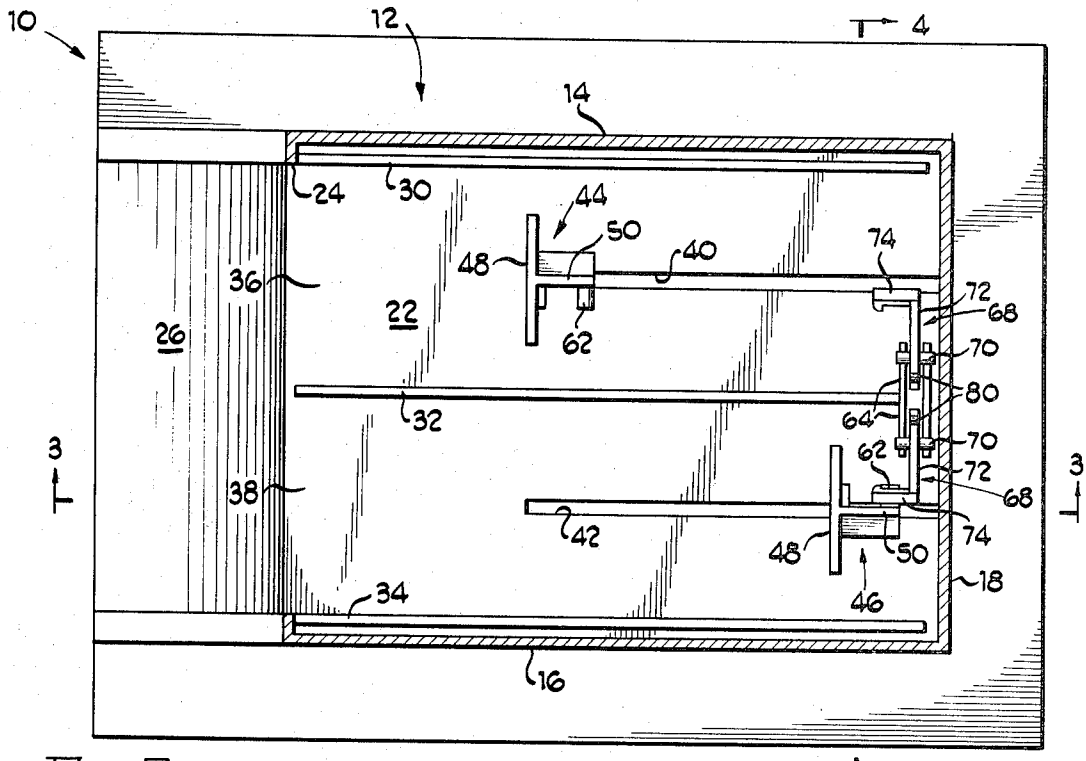


Fig 2

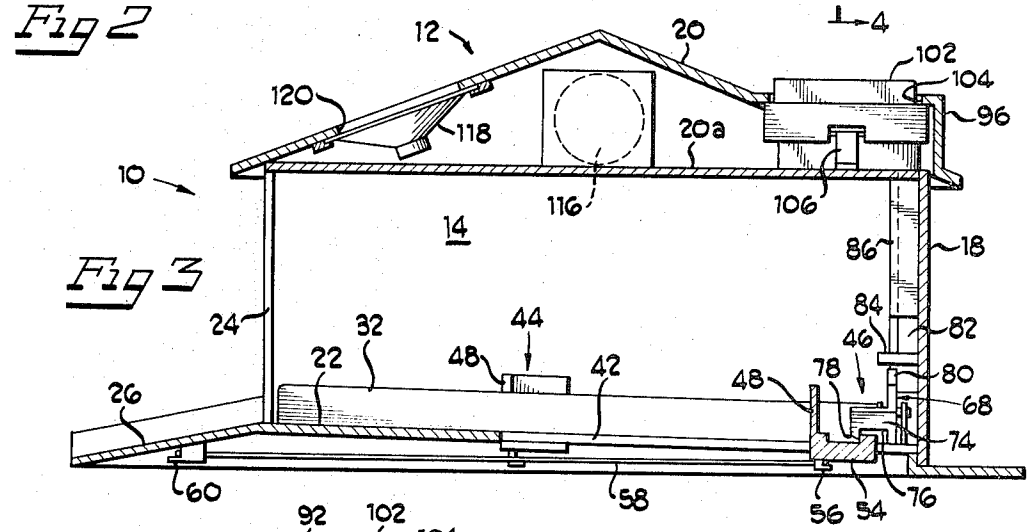


Fig 3

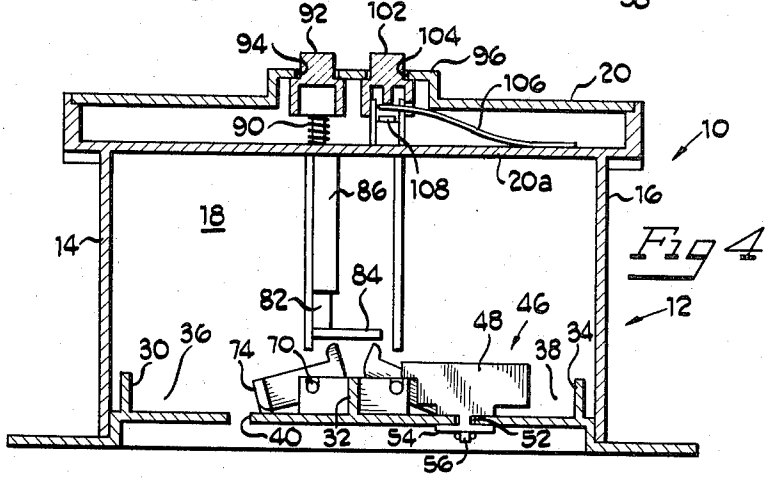


Fig 4

TOY VEHICLE LAUNCHING STATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to toy vehicle launching devices.

2. Brief Description of the Prior Art

There are a wide variety of launching devices for toy vehicles as exemplified by the following patents:

S. Tepper et al.	5/26/70	No. 3,514,108
J. Beny et al.	12/22/70	No. 3,548,534
G. Clowes	1/5/71	No. 3,552,322
J. Beny et al.	2/2/71	No. 3,559,334
T. E. See	2/2/71	No. 3,559,335
J. Beny et al.	2/16/71	No. 3,562,949
J. McRoskey	2/23/71	No. 3,565,430
J. Beny et al.	6/22/71	No. 3,585,751
S. Kupperman et al.	6/28/71	No. 3,588,107
J. Beny et al.	7/6/71	No. 3,590,524
R. Carver et al.	8/17/71	No. 3,599,365
E. Faller	8/24/71	No. 3,600,849
W. Summerfield et al.	8/24/71	No. 3,600,850
T. See et al.	9/20/71	No. 3,605,631
J. Copper et al.	11/9/71	No. 3,618,947
S. Tepper et al.	11/23/71	No. 3,622,158
C. Edwards et al.	12/21/71	No. 3,628,725
R. Lohr et al.	1/25/72	No. 3,636,651
A. Sims et al.	2/15/72	No. 3,641,704

Generally speaking, children are captivated by the role of policemen, firemen, and emergency vehicles. Often during play with toy vehicles, children fantasize the existence and performance of an emergency vehicle such as an ambulance, fire truck or the like, including simulating the siren sound thereof. It is the object of this invention to meet the continuing need and desire in the art for improved toy vehicle accessories by providing a toy vehicle launching station which simulates an enclosure simulating an emergency vehicle garage and includes an audible signal producing system simulating a siren sound, and further includes stressable, and selectively releasable, vehicle launching plungers.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision of a toy vehicle launching station having means defining an enclosure with an open end and separately actuable siren and launching systems.

The best mode currently contemplated for carrying out the invention includes the provision of garage-like enclosure with an open doorway and a pair of toy vehicle receiving tracks in the interior. Each track has a linearally movable plunger therein associated with biasing means and a releasable retainer for placing the plunger in a cocked state when the plunger is retracted adjacent the wall opposite the doorway. In addition, a small siren and related circuitry is provided and are associated with an activating button for engaging the circuitry for a period of time following depression. of the activating button. A separate activating butten is provided for releasing the retention of the cocked plunger for launching a toy vehicle outwardly of the enclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. 2 is a horizontal section view through the toy vehicle launching device shown in FIG. 1;

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 line 4—4 of FIG. 2;

FIG. 5 is a fragmentary enlarged perspective of the upper portion of the launching and siren activating button assemblies;

FIG. 6 is a fragmentary enlarged perspective view of the lower portion of the launching and siren activating button assemblies, and

FIG. 7 is a diagram of the siren circuitry.

While this invention is susceptible 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

The toy vehicle launching station **10** of this invention includes an enclosure generally indicated **12** and intended to simulate a garage-like structure. Enclosure **12** is comprised of upstanding walls **14, 16,** and **18** covered by a roof **20** with the walls being spanned by an interior ceiling **20a** in the interior of the structure. A floor **22** spans the lower portion of walls **14, 16,** and **18** and one end of the structure is open, providing an open doorway **24.** It is to be understood that a movable door could be provided, if desired, for selectively opening and closing access to the interior of the structure **12.** The enclosure **12** further includes a front exit apron **26** which is inclined slightly downwardly and outwardly from the floor **22** and its juncture therewith in the area of the doorway **24.** The launching device **10** is intended for launching toy vehicles **28a** and **28b** outwardly from the structure in a rapidly accelerating fashion.

In the interior of the enclosure **12** a series of short upstanding ribs **30, 32,** and **34,** one adjacent each side wall, and the other medially dividing the interior, define a pair of toy vehicle channels **36** and **38.** A slot is provided in the floor **22** in each of the channels, specifically, the slots **40** and **42** for movably mounting a pair of plungers **44** and **46,** respectively, therein for movement between a retracted or cocked position, and an extended or released position to facilitate launching of vehicles from the enclosure **12.**

Each plunger **44** and **46** has a forward face or vehicle engaging surface **48** and a rearwardly extending web **50.** In addition, a reduced neck **52** depends from face **48** and extends through each of the slots **40** and **42,** terminating in an enlarged flange **54** under the floor **22** which supports a depending hook **56.** Hook **56** has a rubberband **58** connected thereto with the rubberband **58** also being connected to the housing, specifically to a hook **60,** preferably positioned under the apron portion **36.** The rubberband **58** provides a resilient or biasing means which is deformable between relaxed and stressed condition responsive to to and fro movement of the plunger. It is to be understood that a suitable spring means could be provided.

Each plunger **44** and **46** further has a lateral finger **62** at the rear of web **50.** Rib **32** has a pair of crossbars **64** at the rear end adjacent wall **18** having a series of recesses **68***a* and **68***b* therein to provide a means for movably mounting retaining member **68.**

Specifically, each retaining member **68** has opposed outwardly extending pins **70** which reside in recesses

68*a* and 68*b* to pivotally mount the retaining member 68 relative to the mounting bar 64. The retaining members 68 are provided with a first, or rear section 72, and a second, transversly oriented, forwardly extending leg 74. The underside of each leg 74 is notched at 76 and the forward edge of the leg 74 has a downwardly and inwardly curved end 78 providing a cam surface. As the plungers 44 and 46 are moved rearwardly, the lateral finger 62 will engage cam surface 78, causing each retaining member 68 to be pivoted about its mounting and relatively lifted, permitting finger 62 to move under notch 76. The retaining member 68 will then rock downwardly, responsive to gravity, captivating the finger 62 of the plunger in the notch 76 in a cocked state against the force of the stressed rubberband 58. The movement of the plungers to this rearward position can be simply accomplished by pushing rearwardly on a toy vehicle 28 which is inserted into one of the vehicle channels 36 and 38 into abutment with plunger faces 48.

Each of the retaining members 68 has an upwardly extending tab 80 which is intended for engagement with the means for releasing the retainer from its retention of the plungers 44 and 46. Included in the means is a vertical plunger 82 having an enlarged foot 84 at the bottom thereof which overlies both of the tabs 80 of both retaining members 68. Plunger 82 is slidably mounted for vertical movement relative to the structure 12 within a bracket 86 which depends from the underside of the ceiling 20*a*. The plunger 82 extends through an opening 80*a* in ceiling 20*a* and a spring 90 is interposed about the plunger 82 between ceiling 20*a* and button 92 which is fixed to the top of the plunger 82. The button 92 extends through an opening 94 in the roof 20 and, specifically, in the simulated chimney portion 96. Thus, as the button 92 is depressed, the foot 84 will push downwardly on the tabs 80 causing the retaining members to be relatively lifted with respect to each lateral finger 62 of plungers 44 and 46, permitting the stressed rubberband 58 to force the plungers rapidly forward to the extended or released position, thereby forcing a vehicle which is positioned adjacent the plunger face 48 rapidly outwardly of the structure 12.

Means are provided for producing an audible signal. Included in this means is another button 102 which extends through an opening 104 in the chimney portion 96. The underside of button 102 is positioned adjacent leafspring contact 106 which overlies a second contact member 108. The contact member 108 has wire 110 connected thereto and contact 106 has wire 112 connected thereto. Wires 110 and 112 are associated with circuitry, generally indicated 114 which includes a battery 116 and a siren 118. Siren 118 is mounted on the underside of roof 20 below grill portion 120. Through means of circuitry 114, siren 118 is activated when the circuit is energized by pushing the contact 106 into engagement with contact 108.

Circuit 114 specifically includes the wire 110 which leads to battery 116 as well as leading directly to transistor 122. Wire 124 leads from the other side of battery 116 to the other components of the circuit, except for the transistor 122. Wire 112 runs from the leaf spring contact, through a resistor 126 to the other components of the circuit, including condensor 128, resistors 130 and 132, transistor 134, condenser 136, and also transistor 122 as well as resistor 138. Wire 112 terminates at siren 118. Through the aforedescribed circuitry, when the button 102 is depressed to close the contact through 106 and 108, this momentary depression of the button will energize the circuit for a period of time following the closing of the the contacts so that the siren 118 will produce an audible signal for a period of time in excess of the momentary engagement of button 102 with the contacts 106 and 108.

The circuit shown in FIG. 7 provides a direct coupled oscillator. When the switch is closed, base current flows through resistors 130 and 132 into transistor 134 and is divided between transistor 122 and speaker 118. Feedback current from transistor 122 through capacitor 136 adds to the base current of transistor 134 which provides a regeneration for transistor 122.

In operation, participants may cock the plungers by inserting vehicles 28*a* and 28*b* into channels 36 and 38 and pushing against the face 48 of the plungers 44 and/or 46 to force them to the rearward position, wherein the retaining member 68 will captivate one or both of the plungers in the cocked state. Participants may then depress the button 102 to activate the siren circuitry to produce an audible signal, following which, at the desire of the participants, the launching button 92 may be depressed which will release the captivation or retention of the retaining member 68 with respect to the plungers permitting the plungers to move rapidly forwardly under the influence of the stressed rubberband 58, thereby propelling the vehicles 28*a* and 28*b* rapidly outwardly of the enclosure through doorway 24 and down apron 26. It is to be understood that if only one vehicle is inserted in the interior of the housing this vehicle will be launched by the depression of the activation button 92 alone.

Thus it can be seen that the launching station of this invention provides a realiztic simulation of an emergency facility such as an ambulance service, fire station or the like. Participants may first produce the related audible signal in the form of a siren, following which they may cause their vehicles 28*a* and 28*b* to be rapidly ejected outwardly of the housing simulating the fast take off of a vehicle on an emergency mission. It can further be seen that any toy vehicle which is of a size to fit in the channels may be utilized, in that there are no specific tracks, slots, or circuitry with which the toy vehicle must be associated. All that is required is that the vehicle be forced into engagement with the face of the plungers to push the plunger rearwardly so that one or both may be cocked ready to be released to catapult the vehicle outwardly of the enclosure.

In the preferred embodiment the floor 22 is slanted upwardly from rear wall 18 towards opening 24 and the apron 26 is slanted downwardly therefrom. As a vehicle is launched outwardly from the enclosure it will first traverse a slight uphill path of travel and gain initial momentum as it leaves the enclosure in a downhill path of travel over the downwardly inclined apron 26. This augments the simulation of an emergency vehicle leaving a garage or the like in a rapid burst of speed.

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 station comprising: means defining a supporting surface; a vehicle receiving area

on said supporting surface; a plunger member mounted on said receiving area relative to said supporting surface for to and fro movement between an extended, release position and a retracted, cocked position, said plunger having a forward vehicle abutting face and a laterally projecting rear finger; biasing means connected to said plunger and said supporting surface and being deformable when said plunger is moved to said cocked position to stress said biasing means thereby; retaining means on said supporting surface including a finger receiving notch adjacent to the cocked position of said plunger for engaging the finger and holding the plunger in said cocked position, said retaining means being mounted for movement between a finger captivating position wherein said finger is held by said retaining means for retaining said plunger in said cocked position and a finger release position; release means mounted adjacent to said retaining means for movement toward and away from said retaining means, including movement into engagement with said retaining means to release the retention of said plunger, whereby a toy vehicle may be placed on said supporting surface, said plunger moved to said cocked position and said release means activated to launch said vehicle outwardly of said supporting surface.

2. A toy vehicle launching device of claim **1** including signal producing means comprising a normally open circuit; power means in said circuit; switch means for closing said circuit and activating said power means; an audible signal producing device in said circuit and energized by activation thereof; an impulse retention means for maintaining said circuit active following momentary closing of said circuit by said switch means.

3. The toy vehicle launching station of claim **1** wherein said supporting surface is inclined upwardly from the cocked position of said plunger and terminates in a downwardly inclined launching apron.

4. The toy vehicle launching station of claim **1** wherein said retaining means is pivoted relative to said supporting surface between said finger receiving and finger captivating positions and includes a cam surface positioned to abut said plunger finger during movement of said plunger to said cocked position, with said retaining means being responsive to engagement by said finger for movement to said finger receiving position, following which said retaining means moves to said finger captivating position.

5. Launching station of claim **4** wherein said release means is engageable with said retaining means to move said retaining means to said finger receiving position away from said retaining position to permit release of said plunger from said cocked position.

6. The launching station of claim **5** wherein the supporting surface is contained within an enclosure and wherein the release means comprises a member movably mounted relative to the supporting surface for vertical to and fro movement with said release means normally being biased upwardly, and having an actuating surface protruding outwardly of the enclosure within which said supporting surface is located for depressing the member actuating surface in opposition to the biasing means and into engagement with the retaining means.

7. The launching station of claim **6** including signal producing means comprising a normally open circuit; power means in said circuit; switch means for closing said circuit and activating said power means; an audible signal producing device in said circuit and energized by activation thereof; an impulse retention means for maintaining said circuit active following momentary closing of said circuit by said switch means.

8. The launching station of claim **7** wherein said normally open circuit includes a pair of contacts movable toward and away from each other for closing and opening the circuit with one of said pair of contacts underlying an actuating member positioned on the enclosure adjacent to the release means actuating member.

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