Sept. 12, 1950 W. J. SANDERS 2,522,133

GRAVITY TYPE ROLLING BALL GAME DEVICE

Filed May 18, 1944 2 Sheets-Sheet 1

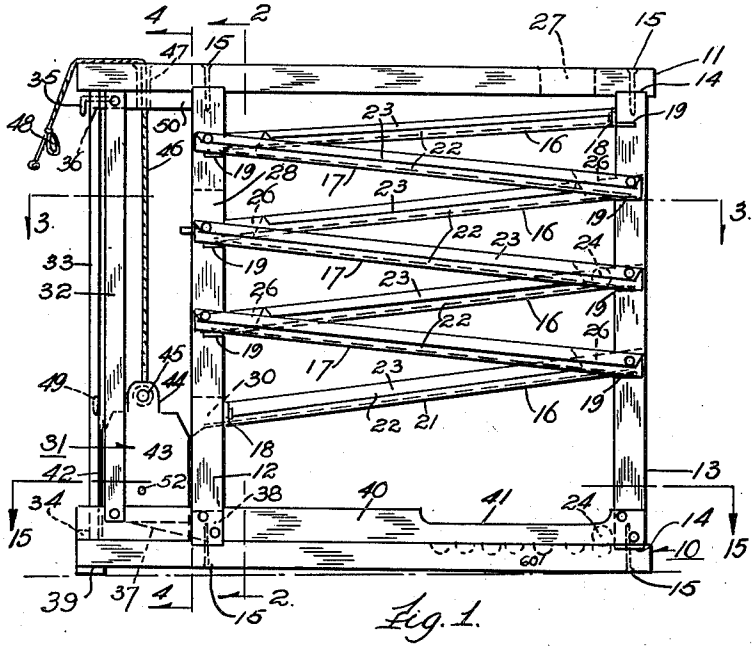


Fig. 1.

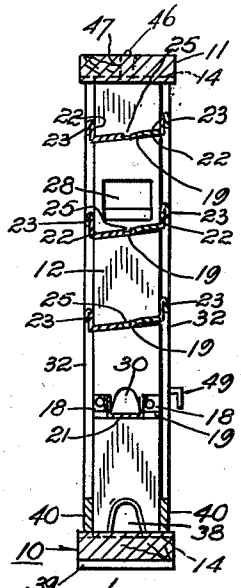


Fig. 2.

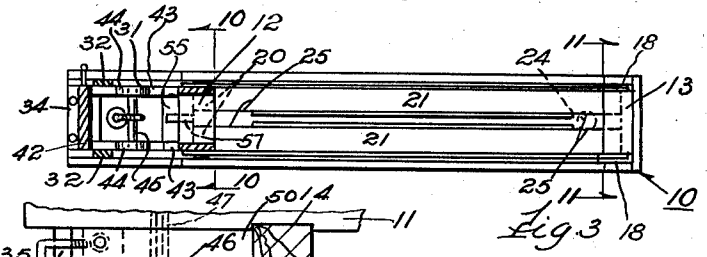


Fig. 3

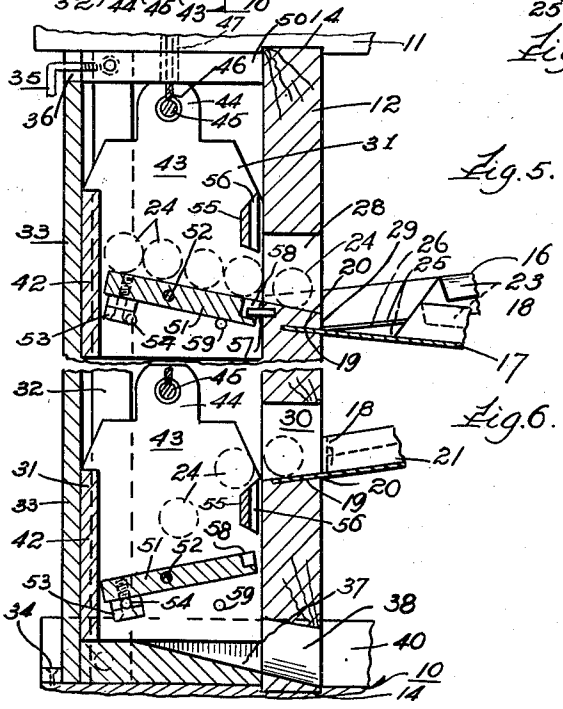


Fig. 5.

Fig. 6.

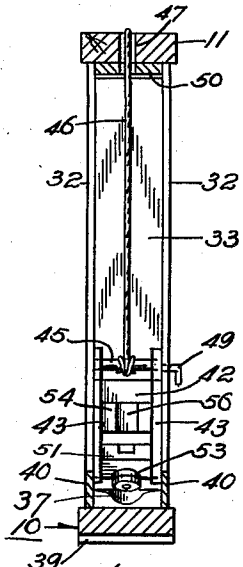


Fig. 4.

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GRAVITY TYPE ROLLING BALL GAME DEVICE

Filed May 18, 1944 2 Sheets-Sheet 2

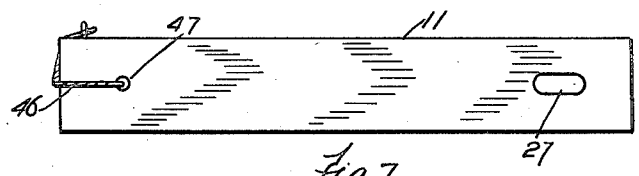


Fig. 7.

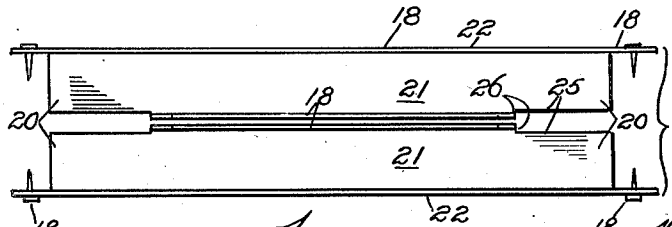


Fig 12

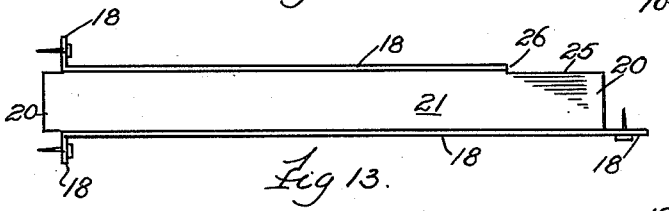


Fig 13.

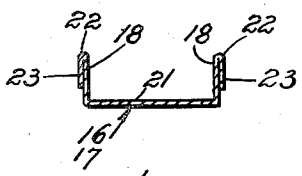


Fig. 14.

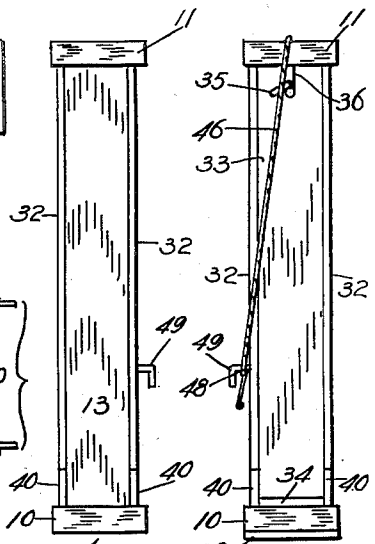


Fig. 8.

Fig. 9.

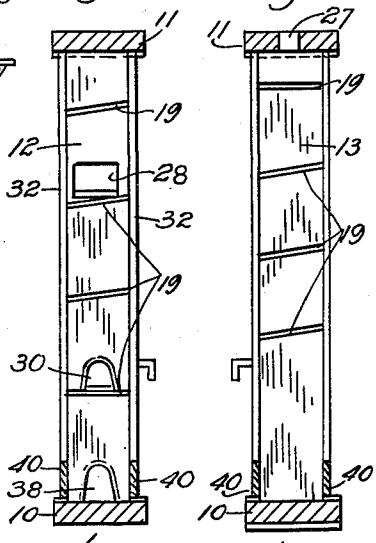


Fig. 10.

Fig. 11.

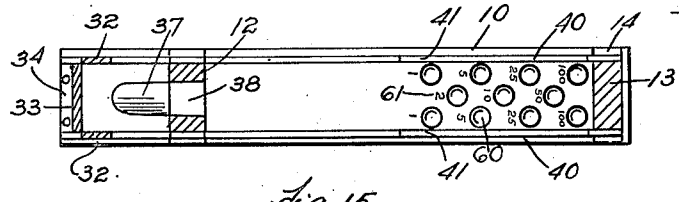


Fig 15.

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GRAVITY TYPE ROLLING BALL GAME DEVICE

Walter J. Sanders, Chicago, Ill.

Application May 18, 1944, Serial No. 536,101

2 Claims. (Cl. 46—43)

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My invention relates to toys wherein a plurality of marbles or balls are adapted to be deposited upon one of a plurality of oppositely inclined channels or chutes and to run down the same in opposite directions in zigzag fashion to be deposited into an elevator or receptacle for the amusement and entertainment, particularly of children.

The invention, also, comprehends a toy of the class described which will be instructive as well as hold the interest of the person or child operating the same, and in which the marbles or balls may be deposited at different points upon one or more inclined chutes, as the starting point, and in which there is provided an elevator for receiving the marbles at the end of travel thereof and discharge from the lowermost chute, and for raising the same to an upper level for automatic discharge into one of the chutes at or near the top of the elevator shaft to be later caught in the elevator at the bottom when lowered, or for deposit into a trough, so that interesting games may be played and a score kept by marking or identifying the marbles of different players, depending upon the number of marbles of which player is deposited into the elevator, or the trough, or merely for amusement and instruction in the operation thereof.

The invention, also, comprehends and has for its object to provide means whereby should any of the marbles pass or become located beneath the elevator, they will not interfere with the movement or lowering of the elevator and may pass into the trough or tray on their travel beyond the elevator or receptacle.

The invention, also, embodies an elevator movable in a shaft or runway traversing openings communicating with the chutes at various points so as to receive the marbles when they have traversed the inclined channels or chutes at the end of their downward travel, and which in addition to the provision of means for depositing the marbles upon the upper chute, is provided with means in the form of a pivoted trapdoor, which upon the elevator being raised, will automatically discharge the marbles in the receptacle or elevator and deposit the same upon one of the chutes to traverse the tortuous path provided thereby for discharge at the bottom, either into the elevator by lowering the same, or beneath the elevator and into a trough or tray provided at such point.

The invention, also, embraces an elevator having a pivoted counterweighted trapdoor spaced from the bottom of the elevator and normally positioned to prevent the escape thereof by closing a

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discharge opening and to automatically trip the door upon raising the elevator to an upward limit or position to cause discharge of the marbles onto one of the chutes.

It is, also, an object to provide means whereby the elevator may be readily placed in position or removed and, also, held free of the hands in a raised position, and to construct the toy, frame and other parts thereof, including the chutes, in a novel manner to facilitate quantity production and accuracy of assemblage or interfitting engagement of the parts and provide for simple manufacture and mounting for the chutes in position, as well as to prevent jamming of the marbles and obstruction of the chutes, particularly at points at the ends thereof where the marbles pass from one chute to another in oppositely inclined directions, and, also, to provide a strong and durable construction which will withstand comparatively rough usage.

Further objects and advantages will appear and be brought out more fully in the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 is a side elevation of a toy embodying my invention.

Fig. 2 is a vertical section, taken on the section line 2—2 of Fig. 1.

Fig. 3 is a horizontal section, taken on the section line 3—3 of Fig. 1.

Fig. 4 is a vertical section, taken on the line 4—4 of Fig. 1.

Fig. 5 is an enlarged fragmentary vertical section, showing the elevator raised in its shaft or runway and the trapdoor in position to discharge the marbles therefrom.

Fig. 6 is a view similar to Fig. 5, but taken at the lower portion of the elevator shaft and showing the trapdoor of the elevator in position to restrain the discharge of the marbles therefrom.

Fig. 7 is a top plan view of the toy.

Fig. 8 is an end elevation looking at the end remote from the elevator.

Fig. 9 is an end elevation, looking at the end adjacent the elevator.

Fig. 10 is a sectional view, taken on line 10—10 of Fig. 3, as seen in the direction of the arrows.

Fig. 11 is a view similar to Fig. 10, but taken on the line 11—11 of Fig. 3, with the chutes removed.

Fig. 12 is a plan view showing two oppositely inclined cooperating chutes on an enlarged scale.

Fig. 13 is a plan view of one of the end chutes,

Fig. 14 is an enlarged transverse section of one of the chutes, taken at an intermediate point, and

Fig. 15 is a horizontal section on the line 15—15 of Fig. 1.

Referring more specifically to the drawings, the toy or toy game is shown as embodying a rectangular frame made up of strips of wood or other suitable material, preferably taken from stock, and having a base strip 10 and a parallel horizontal top strip 11 connected by spaced uprights or strips 12 and 13, the former of which may be spaced from one end of the frame, and the ends of the top and bottom strips 10 and 11, and the strip 13 is near the other end. Any suitable joints may be provided between the upper and lower ends of the vertical strips 12 and 13, and the top and bottom strips 10 and 11, but as shown, mortise and tenon joints 14 are provided with the opposed lower and upper faces of the top and bottom strips respectively, recessed to receive the ends of the upright or vertical strips so as to positively and accurately locate the latter and facilitate assemblage of the frame.

Additional fastening means 15 may be provided to secure the members or strips of the frame together, or they may be glued instead, or supplementary thereto.

With the strip 12 spaced from one end of the frame and strip 13 near the other end, these strips support oppositely inclined channels or chutes 16 and 17 which are fastened or nailed thereto at their ends, by means of side flanges or outturned oppositely directed portions, as at 18. Slots 19 arranged obliquely in the uprights 12 and 13 are adapted to receive the ends 20 of the webs of the channels or chutes, the web portions or bottoms of the chutes being designated at 21.

The chutes have side flanges 22 bent in the same direction substantially parallel to each other with bent-over portions 23 to provide rounding edges which prevent injury or cutting by contact therewith from handling. All of the slots 19 are inclined, the inclination being in opposite directions at the opposite ends of the chutes in the respective upright strips 12 and 13, and being merely sawed or cut into the strips for a portion of the thickness of each, except the uppermost and lowermost slots which are disposed horizontally to receive the projecting ends 20 of the web portions 21 of the top and bottom chutes. These chutes may be made of sheet metal, such as tin, or of plastic or other suitable material, and thus, may be readily secured after being cut and bent or shaped, or produced from blanks first cut and then shaped, or even molded into form.

The flanges on the intermediate chutes extend in a plane parallel to the longitudinal axis of the chutes; while, as best shown in Fig. 13, the flanges of the top and bottom chutes, at one end, are bent outwardly in opposite directions and in a plane normal to the above mentioned longitudinal axis. It should also be noted that the chutes are each approximately as wide as one-half the width of the upright strips so that the inner edges defined by the inner flanges 18 will lie in closely parallel vertical planes. As hereinbefore stated, the ends of the web portions or bottoms of the chutes are supported in transverse slots 19 in the uprights 12 and 13, which slots are oppositely inclined in the respective uprights. By this arrangement, each of the several chutes are inclined laterally in one direction at one end thereof and gradually twisted to incline laterally in the opposite direction at the other ends. This will cause the lower end of each chute to incline laterally toward the adjacent end of the next lower chute in order, so as to discharge the balls laterally into the upper end of the latter. Each chute is therefore inclined outwardly at its upper end and inwardly inclined at its lower end.

The purpose of this is to cause the marbles or balls designated at 24 to pass from the lower end of one chute onto the upper end of the next chute therebeneath, but specifically at one side thereof through openings 25 provided by cutouts 26 at the corresponding or adjacent ends of the chutes at the flanges thereof, except at the uppermost and lowermost ends of the uppermost and lowermost chutes respectively, where the slots 19 are horizontally arranged as heretofore described.

By cutting away the chutes 16 and 17 on the inner sides or flanges thereof, the balls 24 when deposited upon one of the chutes will run from an upper chute into a lower chute, due to the lateral inclination thereof and will prevent jamming of the balls and obstruction of the chutes thereby at the ends where the turns or reverse travels in direction are made.

The upright strips 12 and 13, also, form abutment members at their inner faces to take the impact of the balls rolling down the chutes at the opposite ends thereof, where the changes in direction or turns are made, and since the balls tend to move inwardly on the chutes, they may be deflected angularly toward the next chute, but the impact may cause rebound so that the balls may be deflected by those following. Some cushioning action results, but the shock is incidental and the sounds of the balls rolling down the chutes and striking the strips at the ends thereof is indicative of the operation of the device and serves to attract attention and hold the same, as well as to amuse and instruct, consciously or otherwise.

An elongated slot or hole 27 is provided in the top strip 11 over the uppermost chute which is centrally disposed at the adjacent end under the correspondingly located hole for depositing the balls at this point onto the uppermost chute to travel down the remaining chutes past an inclined opening 28 provided in the strip 12 at or near the top thereof, but shown located at the lower end of one of the lower chutes, specifically the third from the top, to form a shoulder 29.

The opening 28 may be arranged at any suitable point depending upon the elevation of the elevator, as will be later described, and inclines from the outer to the inner face of the strip 12 toward the chutes. At the lower end of the lowest chute, a discharge hole 30 is provided through the strip 12 and the extended end of the web portion 20 of the chute at this point which extends into the slot 19 horizontally located at such point, may extend partially into the opening or hole 30 at such point, but inclined toward the outer face of the strip 12 at the bottom of the hole to discharge the balls 24 from the runway formed by the chutes or channels 16 and 17.

This end of the lower chute 16 is, also, centrally located, as is the hole 30, and the chute end and web portion are fastened in position in the same manner as the upper end of the uppermost chute or section of the runway. The shoulder 29 prevents the balls from passing into the opening 28, but since the latter is inclined inwardly, such action is unlikely to happen.

An elevator or receptacle 31 is adapted to slide up and down in a vertical guideway or elevator shaft between the top and bottom strips 10 and 11 and between the vertical strip 12 and side strips 32 arranged vertically between the strip 12

and the adjacent ends of the top and base strips, and a further but transverse vertical end strip 33, held at its lower end within a cross-strip 34, and at its upper end by a turn-button 35, which may be slid through a slot 36 in the upper end of the strip 33, when vertical, to displace the strip 33 outwardly and upwardly from strip 34 after disengaging the turn-button 35, to permit placement and removal of the elevator 31 by spreading or removing the side strips 32.

At the bottom of the elevator shaft, the base strip 10 is provided with a groove having an inclined bottom surface, as at 37, which serves to discharge any balls dropped thereon from above. From the inclined surface 37, the balls are directed through an opening 39 into a tray, as hereinafter described.

This may be accomplished in any suitable way, such as by a block or strip 39 positioned beneath and secured to the opposite end portion of the base strip 10, so that the latter may be of uniform stock material. The vertical strips 12 and 13 are preferably slightly narrower than the top and bottom strips 10 and 11 to project outwardly therefrom, so that the trough may be formed by side strips 40 placed longitudinally and substantially horizontally on edge on the projecting portions of the base strip, and secured to the upright strips.

The side strips 40 may have cut away portions 41 to facilitate access to and removal of the balls 24 from the trough or tray formed thereby with the strips 12 and 13 and the base strip 10. The receptacle or elevator 31 has an outer wall 42 and side walls 43, the upper ends of which have reduced portions 44 connected by a bail 45, in the form of a pin or bolt through the reduced portions 44 of the side walls 43 for attachment of a cord or other flexible connection 46.

This cord passes through an aperture 47 in the top strip 11 centrally over the elevator shaft and has a loop 48 between its ends or at its free end to anchor to a pin 49 to hold the elevator at the top against a stop 50 which carries the turn-button 35. This stop is in the form of a strip or block secured beneath the top strip 10, and the side strips 32 are secured at their upper and lower ends to the strip 50, and the inclined portion or strip 37 respectively, at the sides thereof, the side strips 40 being recessed to accommodate the lower ends of the strips 32.

The stop 50 engages the upper end of the elevator at the reduced upper end portions 44 thereof, when the elevator is raised, to limit the upward movement and prevent the same from passing beyond an operative point or elevation for discharge of the balls through the opening or slot 28, as will now be described.

The bottom of the elevator or receptacle 31 has a trapdoor 51 pivoted at 52 and held in its normal position by a counterweight 53 against stop pins 54 at the inner faces of the sides 43, or otherwise disposed across the space therebetween, to close the opening at the front end thereof formed beneath a transverse vertical partition 55 at the inner edge or side of the elevator and between said partition and the trapdoor beneath the partition to keep the balls in the elevator or receptacle and preclude the escape thereof until the trapdoor has shifted from its normally outwardly and rearwardly inclined position, shown in Fig. 6, to a forwardly or inwardly inclined position, as shown in Fig. 5.

The partition 55 has a vertical groove 56 at its inner face designed to pass a stop pin 57 when

the receptacle is raised, so that the latter will engage a notched end 58 at the front of the trapdoor and force the latter downwardly against stop pins 59, similar to stop pins 54, but positioned near the inner side or front of the elevator between the sides 43 beneath the trapdoor to limit the downward movement of the latter in discharge position, as shown in Fig. 5, so that the balls will roll through the opening 28 onto a chute and proceed downwardly on the remaining lower chutes.

The stop pins 54 and 59, or other limiting means for the trapdoor are spaced from the bottom of the elevator or receptacle provided between the side walls 43 and the outer wall 42 so that should any of the balls pass beneath the trapdoor, they will not interfere with the lowering of the elevator or strike the trapdoor, since they will roll down the inclined strip or portion 37 at the bottom of the elevator shaft and through the opening 38 onto the base strip 10 in the trough or tray provided between the strips 12 and 13 forming the upright or vertical members, and the side strips or rails 40.

The inner side of the elevator is open except for the trapdoor and the partition 55, the space between which is restricted when the trapdoor is in retaining position, to a space narrower than the diameter of a ball so that the latter cannot pass, but will be deflected rearwardly when held in this position by the counterweight 53. When the trapdoor is inclined in the opposite direction, such space is wider than the balls so that the latter may freely run out of the elevator and be discharged through the opening 28.

When the stop pin 57 is engaged by the trapdoor at its front edge beneath the partition 55, such as at the notch or recess 58, it will lower the trapdoor at the front end so that it is inclined in the opposite direction to discharge the balls in the receptacle or elevator through the hole or opening 28 and onto the chute.

It will thus be seen that I have provided a toy by which a plurality of balls may be deposited upon one or more of a plurality of oppositely inclined channels or chutes constituting oppositely inclined runways and that the balls, when so deposited, will be discharged at the bottom after traveling a zigzag or tortuous path. In other words, the balls may be deposited manually at the top, or automatically by raising the elevator, and that the elevator may be held upwardly or lowered, so that the balls will be discharged from the lower chute into the bottom of the elevator shaft to run into the trough, or into the elevator in position to be again raised and emptied or dumped.

The base strip 10 forming the bottom of the tray or trough may be provided with recesses 60 marked with score values, as at 61, and in which the balls 24 may come to rest to provide a scoring means for proponents operating and playing the toy-game.

The device is capable of economical production in quantities and may be quickly assembled or repaired, as by replacement of parts, if the same should be damaged, although it will withstand considerable rough usage. It will hold the attention and interest of the person or persons using the same, especially children and is both amusing and instructive.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of varia-

tion and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a toy, a frame having an inclined runway and openings for discharging balls onto the runway, an elevator shaft secured to and extending vertically at one end of the frame, an elevator movable in said shaft and having a trapdoor normally held in a position to retain balls in the elevator, said elevator having means to receive the balls discharged from the runway, a stop pin on said elevator shaft, said pin being engageable by and effective to move the trapdoor to discharge the balls when the elevator is raised, a base strip included as a part of said frame and having a portion at the bottom of said elevator shaft formed with a groove to receive the balls at the foot of the shaft when the elevator is raised to an upper portion of said shaft, and side strips included in said frame on opposite sides of the remainder of said base strip and cooperating therewith to provide a tray communicating with said groove and adapted to receive balls therefrom.

2. A toy comprising a frame having oppositely inclined chutes and a tray at the bottom, an elevator shaft arranged adjacent to said chutes and secured to the frame, said frame having an opening for discharging balls onto certain of the chutes and another opening for discharging balls from the chutes, an elevator movable in the shaft and having a trapdoor near the bottom, said bottom being normally held in a position to retain the balls in the elevator, and a stop pin carried by said elevator shaft and projecting into the path of movement of said elevator, said stop pin being operable by engagement with said trapdoor to automatically move the trapdoor to an inclined position to discharge balls through the first mentioned opening when the elevator is raised.

WALTER J. SANDERS.

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