B. F. BAIN.

MECHANICAL TOY.

APPLICATION FILED MAR. 14, 1919.

1,404,728. Patented Jan. 31, 1922.

FIG. 3.

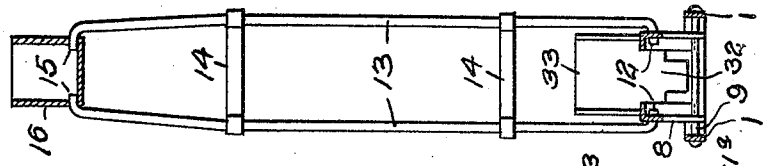


FIG. 1.

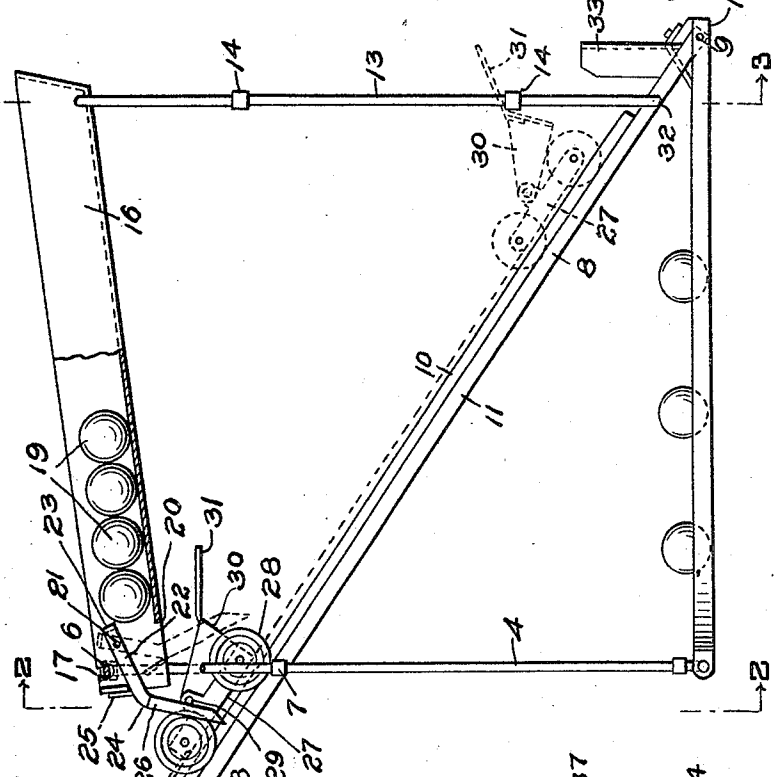


FIG. 4.

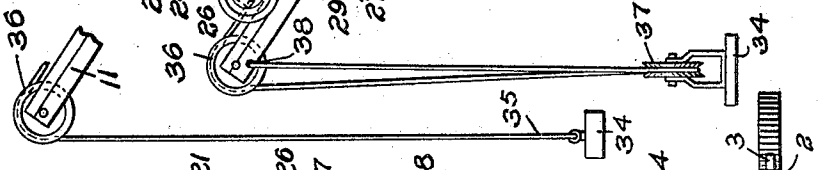
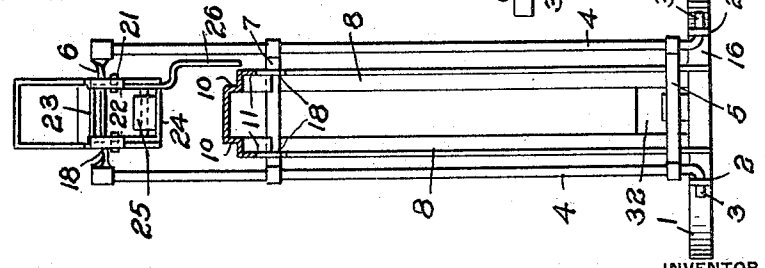


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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MECHANICAL TOY.

1,404,728. Specification of Letters Patent. Patented Jan. 31, 1922.

Application filed March 14, 1919. Serial No. 282,686.

To all whom it may concern:

Be it known that I, BENJAMIN F. BAIN, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Mechanical Toys, of which the following is a specification.

This invention relates to mechanical toys of a kind embodying a movable car arranged to travel up and down on an inclined track or way and arranged at its upper limit of travel to automatically receive a ponderous body or weight which carries the car down the track, and which is automatically discharged from the car in its downward travel to permit a counterweight to return the car to the upper end of the track to receive another ponderous body or weight.

One difficulty with toys of this character is that the difference in weight between the ponderous body and the counterweight is so slight that the unavoidable friction of the parts is likely to render the device inoperative or uncertain in operation.

The object of the present invention is to provide a toy of the character specified which is certain in its operation, stable and durable, but which nevertheless is cheap to construct, and which can be folded into compact form for packing and shipping.

In the accompanying drawing Fig. 1 is a side elevation partly in section of the toy, showing the car in full lines in its upper position and in dotted lines in its lower position; Fig. 2 is a front elevation of the same with the track in section on the line 2—2, Fig. 1; Fig. 3 is a vertical section on the line 3—3, Fig. 1; and Fig. 4 is a detail view showing a modification.

The device comprises a base member 1 formed of a metal strip bent in the form of a loop closed at its rear end 1^a and open at its front end 1^b, and of considerable width, particularly toward the front, to form a stable base for the toy, and having its free front ends provided with perforated ears 2 adapted to receive the lower bent ends 3 of front uprights 4 which are cross connected at intervals as shown, to-wit, by a bottom cross bar 5, a top cross bar 6 and a third cross bar 7 near its upper end. The base member is made of resilient metal so that the ends 2 can be sprung apart to disengage the same from the bent ends of the uprights 4. An inclined track 8 has its lower end pivotally secured to the narrow rear end of the member 1, by cross pin 9, and extends over the cross bar 7 of the uprights 4, and somewhat beyond the same. This inclined track is provided with a central raised portion forming guides 10 for the carriage wheels, hereinafter described, and has its edges provided with downwardly projecting flanges 11 to stiffen the same. Flanges 11 near the lower end of the track are provided with perforations to receive the lower bent ends 12 of uprights 13, which are connected by a pair of cross bars 14 spaced some distance from the ends of the uprights, so as to allow the ends of the uprights to be sprung apart, to disengage their lower ends from the track, and also disengage their upper ends, which likewise are provided with inwardly bent portions 15, from perforations in the elevated receptacle 16. This receptacle is in the form of a trough, slightly inclined from its rear end where it is supported by the uprights 4. The inclined track 8 and the elevated receptacle 16 are detachably connected respectively to the cross bar 7 and the cross bar 6 of the front uprights 4, by providing the down-turned flanges 11 of the track, and the upper edges of the receptacle with slots 17 which are enlarged inwardly from the edges of the parts, and which engage notched or narrowed portions 18 on the bars 7 and 6 respectively, these bars being formed of flat metal, so that by turning the parts relative to each other they can be made to engage and disengage, in a manner illustrated in prior patents to me. By this means the various parts can be readily taken apart and folded into compact form for packing and shipping.

The elevated receptacle 16 is adapted to contain a number of ponderous bodies or weights, preferably of spherical form, such as marbles 19, and which will roll by gravity down toward the lower end of said receptacle, the bottom of which is cut away to provide a discharge outlet 20 for the marbles. To control the discharge of the marbles through said outlet there is pivoted to the side walls of the receptacle, at 21, a suitable escapement device comprising a substantially rectangular loop 22 whose upper cross member 23 is in position to contact with the marbles near their tops and hold them back and whose lower cross member 24 together with a plate 25 carried thereby forms a temporary support for a marble when it is released by the upper cross member so that it

can drop to the discharge opening. This escapement member is provided with an actuating arm 26 which projects downwardly at the side of the track in position to be actuated by the car.

The car 27 is formed of sheet metal, and is provided with four wheels 28, the wheels of each pair being spaced apart such a distance as to straddle the guides 10 on the track so that the car will move up and down in properly guided relation to the escapement mechanism described. This car is provided with a laterally projecting pin 29 arranged, when the car approaches the upper limit of its travel, to contact with the actuating arm 26 and swing the escapement to a position to allow a marble, temporarily resting on its cross member 24, to drop down into the car, while bringing its upper cross member 23 into position to hold back the remaining marbles.

Pivotally secured to the car, preferably on the pin 29, is a stirrup shaped sheet metal member 30 forming in effect a car body and serving as a retainer for the marble as the car travels down the track. The base of this stirrup is provided with the outwardly inclined arm 31, which, when the car approaches the lower end of its travel, passes over the lower cross bar 14 of the rear uprights 13, thereby causing the stirrup member 30 to be lifted, as shown in dotted lines, Fig. 1, and permit the discharge of the marble.

The track near its lower end is provided with an opening 32, and at the lower end of the opening with a vertical guide 33 which directs the marble discharged from the car through the opening 32 onto the floor or table and into the loop enclosed by the base 1.

The car is moved upwardly on the track by means of a freely suspended counterweight 34 which, as shown in Fig. 4, is suspended on cord 35 which passes over guide pulley 36 journaled on a cross pin at the upper end of the inclined track, and thence connected to the car. This counter-weight suspended as shown, provides a minimum amount of friction of these parts, so that said counter-weight will obviously return the carriage to upper position with sufficient force to actuate the escapement mechanism, to permit a discharge of a marble into the car, and notwithstanding that there is only a slight difference between the weight of the car and the marble therein and this counterweight, the car nevertheless will travel rapidly to the bottom of the inclined track, due to the small amount of friction in the parts whereby the loaded car need overcome merely the counter-weight and the slight amount of friction offered by the guide pulley.

In order to reduce the height of the toy and make it more compact, and nevertheless provide a long travel for the car, the cord 35 may be doubled, as shown in Fig. 1, and passed over a pulley 37 on the counterweight 34, and thence extended upwardly and its free end secured to the upper end of the track, as at 38. This arrangement may introduce slightly more friction than the form shown in Fig. 4, but enables the car to have a longer travel relative to the vertical movement of the counter-weight.

The toy described is of strong and durable construction, can be readily folded and packed and shipped, and yet is of cheap construction. It is certain and positive in its operation, due to the small amount of friction in the parts thus insuring the car reaching both its elevated and its lower position with sufficient force to certainly actuate the escapement on its upper travel and certainly discharge the marble on its downward travel, and this notwithstanding that the difference in weight between the marbles and the counter-weight necessarily is only slight.

I claim:

1. In a mechanical toy, the combination of a pair of vertically-disposed uprights, an elevated inclined trough for ponderous bodies connected at its opposite ends to said uprights and having a discharge outlet for said bodies, an inclined track extending beneath said trough and leading downwardly from the discharge outlet thereof, a car movable on said inclined track and provided with a pivoted horizontally-disposed stirrup, means automatically actuated by the car for delivering the ponderous bodies individually to the stirrup on said car in the upper position of the car, means for raising the stirrup to discharge the ponderous bodies from the car at the point in its downward travel, a cord connected to the car, a guide pulley for the cord at the upper end of the inclined track, and a freely suspended counter-weight on said cord.

2. In a mechanical toy, in combination, an elevated receptacle for ponderous bodies having a discharge outlet for said bodies, an inclined track leading from the discharge outlet of said receptacle, a car movable on said inclined track and arranged to receive ponderous bodies from said elevated receptacle and to discharge said ponderous bodies in its downward travel, a counter-weight for actuating said car, a base frame on one end of which the lower end of the inclined track is supported, rear uprights detachably connected to the lower end of said inclined track and to one end of the elevated receptacle, and front uprights having their lower ends detachably connected to the opposite end of the base frame and detachably connected to and

supporting the forward end of the inclined receptacle and the elevated end of the inclined track.

3. In a mechanical toy, the combination of a frame, an inclined narrow trough attached to the upper portion of the frame for holding in successive arrangement a plurality of ponderous bodies and having a discharge outlet, an inclined track extending below said trough and leading downwardly from the discharge outlet thereof, a counter-weighted car movable on said track and provided with a bottom for supporting ponderous bodies above and out of contact with the track, means automatically actuated by the car for delivering ponderous bodies individually from said trough upon said car in the upper position thereof, and means automatically actuated by the car for discharging said bodies from the car at a point in its downward travel.

In testimony whereof, I have hereunto set my hand.

BENJAMIN F. BAIN.

Witnesses:
ALICE A. TRILL,
MARY LAVELLE.