Jan. 13, 1925. 1,523,244

B. F. BAIN

MECHANICAL TOY

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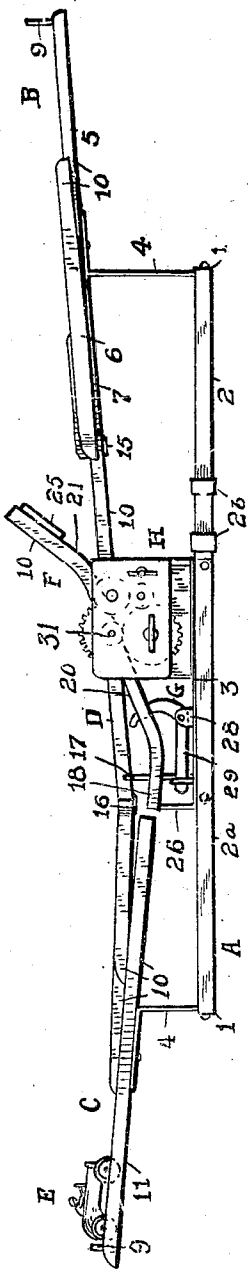


Fig. 1

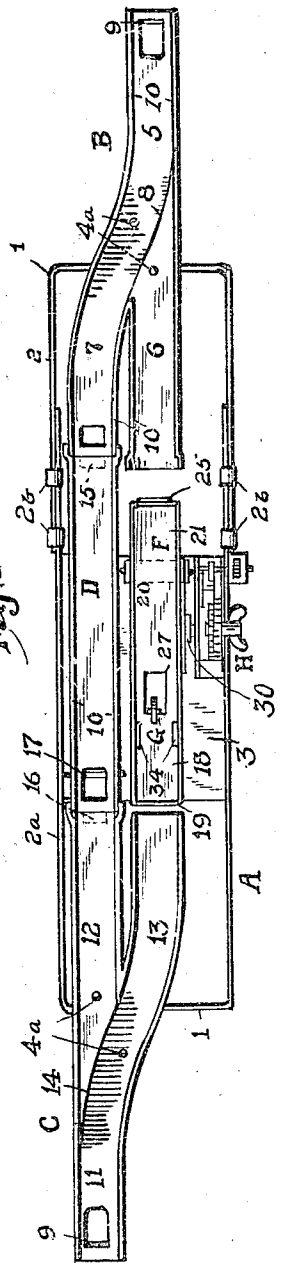


Fig. 2

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Fig. 3

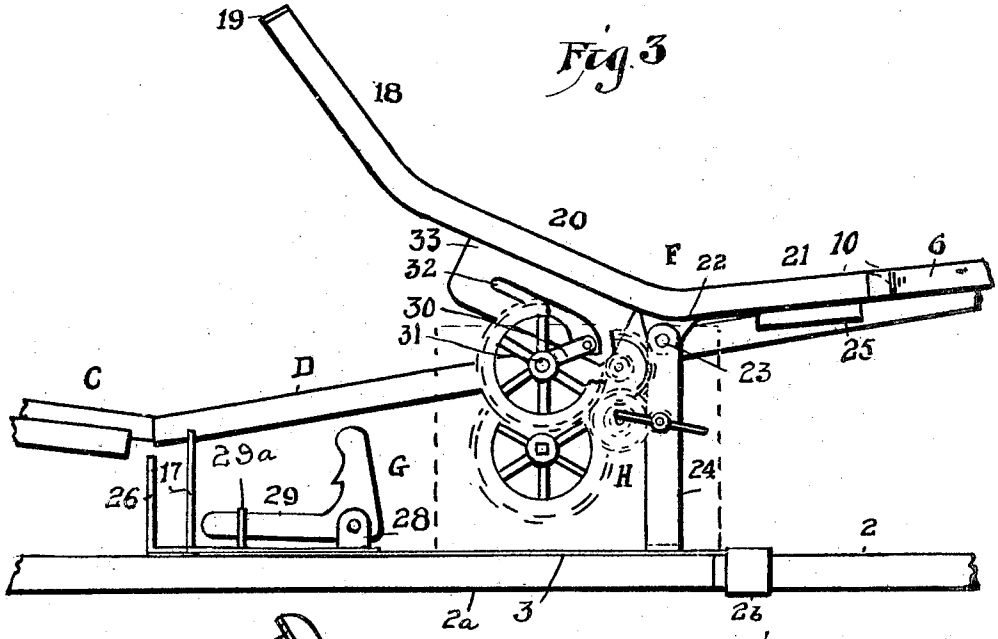
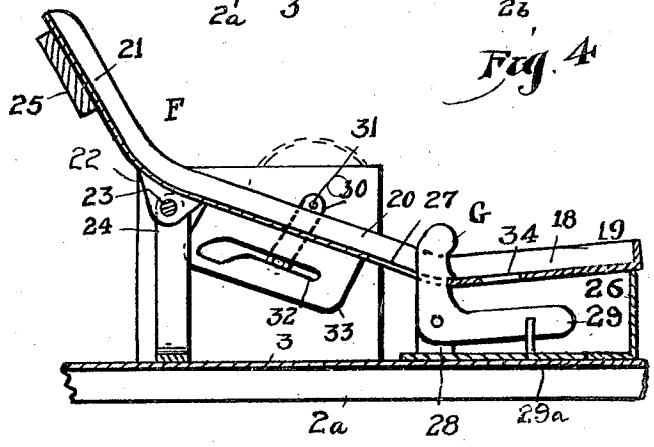


Fig. 4



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UNITED STATES PATENT OFFICE.

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MECHANICAL TOY.

Application filed February 19, 1924. Serial No. 693,776.

To all whom it may concern:

Be it known that I, BENJAMIN F. BAIN, a citizen of the United States, and residing in the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered the new, useful, and Improved Mechanical Toy, of which the following is a specification.

My invention consists in a new and improved mechanical toy. Generally speaking my invention comprises a track having elevated ends, and a car or other travelling element which is caused to travel back and forth thereon.

One end of the track is preferably higher than the other end thereof so as to provide sufficient momentum to properly carry the car or other travelling element to the other end of the track, and intermediate of the ends the track is provided with a power-driven impeller which engages the car and imparts sufficient momentum thereto to cause it to return to the higher end. For the impelling function I show a power-driven oscillating member or track section which is released from its receptive position when the car enters it and which by its oscillation drives the car up to the higher end.

In the preferred embodiment of the principles of my invention which is shown in the drawings, I provide a switch-back track with elevated ends, one leg of the double track providing for the gravity travel of the car from one elevated end of the track to the other, as for instance from the higher to the lower elevated end, while the other leg of the track is used for the return of the car and has interposed therein a power-driven impeller which receives the car and then, by means of an oscillation movement, imparts to the car sufficient momentum to carry it to the first named end, and which impeller then returns and comes to rest in its receptive position. Means are provided at the track ends for the automatic switching of the car from one leg of the track to the other.

Other novel features of construction and also of arrangement of parts will appear from the following description.

In the accompanying drawings which are however merely intended to illustrate a practical embodiment of the principles of my invention without limiting the scope thereof to the construction shown, Fig. 1 is a side elevation of the toy with the impeller shown in its receptive position; Fig. 2 is a plan view of the same; Fig. 3 is a broken side elevation on enlarged scale showing the impeller in its discharging position, and Fig. 4 is a similar view, but in reverse to Fig. 3, showing the impeller in its receptive position.

The following is a detailed description of the drawings.

A represents the base of the toy, which is shown as a rectangular frame having end portions 1, and which is extensible, as by having the side members 2 of one end slidable in sleeves 2^b secured to the side members 2^a of the other end portion of the frame. Thus the base may be contracted in length for packing.

3 represents a horizontal floor spanning the intermediate portion of the base.

B and C represent the two opposed track-end members which are conveniently stamped from sheet metal.

The track-end B, the right end in Figs. 1 and 2, is preferably the higher of the two track-ends, and both of said track-ends are inclined upwardly and outwardly, as shown. For the purpose of supporting the track-ends in position I show vertical brackets 4 secured to the ends 1 of the base A, and whose upper ends are flanged at the proper angles to support the track-ends from beneath, screw bolts 4^a being used to detachably secure the parts together.

The track-ends are composed of an outer single track portion or spur, while their inner ends are bifurcated to provide two tracks. Thus the track-end B comprises a spur 5 and connected to the inner end thereof the two branch tracks 6 and 7, the branch 6 being alined with the spur 5, while the branch 7 curves into the same. The floor of the branch 7 is continuous with that of the spur 5, while the floor of the spur 5 is below the level of that of the branch 6 at the junction, thus forming a shoulder or jump-off 8 which acts as a switch to direct a car traveling down the spur 5 into the branch 7. The outer end of the spur 5 is provided with a guard or bumper 9, preferably formed by partially cutting out a tongue of metal from the floor and then bending it up vertically. The sides of the spurs and branches are provided with the vertical retaining flanges 10 to prevent derailment.

The track end C is similar to the track-end B, comprising the outer, single-track spur 11 and the two branches 12 and 13 connecting to

the inner end of the spur. The branch 12 is alined with the spur 11 and is in the same vertical plane as the end of the branch 7 of the track-end B, while the branch 13 curves into the junction and has its other end in the same plane as the branch 6 of the track-end B.

The floor of the branch 12 joins the floor of the spur at a higher level, thus forming the shoulder or jump-off 14 which automatically switches a car running down the spur 11 into the branch 13.

The outer end of the spur 11 is provided with a bumper 9 and the sides of the spur and the branches are guarded by the flanges 10, as in the case of the track end B.

The opposed ends of the branches 7 and 12 are connected by the track element D which is preferably detachable so that the toy may be disassembled for packing.

The track element D is single-tracked and is stamped from sheet metal with side retaining flanges 10. It may be connected up in place in any convenient manner, as for instance by telescopic engagement with the ends of the branches 7 and 12, as indicated in the drawings. As an additional connection, a tongue of metal 15 may be cut from the floor of the branch 7 and bent forwardly to engage the floor of the element D from beneath. At the other end of the element D a similar tongue 16 may be cut from its floor and bent forwardly to engage the floor of the branch 12 from beneath.

The track element D is also supported by a vertical bracket 17 extending up from the floor 3 and having its upper end notched to receive the element.

It is evident that if a car, such as the toy automobile E be placed on the spur 5 of the track-end B, it will switch onto and run along the branch 7, traverse the element D and travel up the branch 12, and enter the spur 11 of the track-end C, provided the car has sufficient momentum, which momentum in the embodiment shown is provided by the superior elevation of the track-end B. It is also evident that when the car E strikes the bumper 9 at the outer end of the spur 11, its travel will be reversed and it will start back and be switched into the branch 13.

It is thus necessary to provide means whereby the car may be caused to return to the track end B, traveling up the branch 6 to the stem 5. This is accomplished by means of the impeller which consists in an oscillating track-element F, one of whose ends, when the impeller is in its receptive position, as shown in Figs. 1, 2 and 4, is in registration with the end of the branch 13, and which, when the car runs off the branch 13 onto the impeller, oscillates into its discharge position, shown in Fig. 3, with its other end registering with the end of the branch 6, whereupon it discharges the car with sufficient momentum to cause it to travel up the branch 6 into the spur 5 where its travel is reversed, causing the car to again pass down the branch 7.

The track element F is also stamped of sheet metal having side retaining flanges 10. The floor of the track is not in the same plane but is angular as shown, providing at one end a short receiving track 18 which is in substantial registry but slightly below the end of the branch 13, when the member F is in its receptive position, the end of the element F being provided with a vertical bumper or flange 19 to prevent the car accidentally dropping off. Next to the receiving track 18 is an intermediate track 20 and at the other end of the element is the discharge track 21 which, when the element F is in its discharge position, registers with and preferably overlaps from above the end of the branch 6.

At approximately the juncture of the portions 20 and 21 the element F is pivotally mounted for oscillation. Thus at either side is a depending bracket 22, and 23 is a pivot-shaft extending through alined holes in said brackets and also in alined holes in the twin stands 24 extending upwardly from the floor 3. The end 21 is provided with a weight 25 attached to its underside to balance the other and longer of the element F.

26 is a sheet metal post extending up from the floor 3 and having its upper end notched to receive and support the element F when in its receptive position.

The impeller F is normally locked in its receptive position, shown in Figs. 1, 2 and 4, by means of the latch G which extends up through a longitudinal slot 27 in the track 20 with its notch engaging the front end of said slot so as to be struck and disengaged by the car when it runs on the impeller F from branch 13. The latch G is angular and is pivoted at its angle between the pierced ears 28 extending up from the floor 3. The lower leg 29 of the latch extends forwardly in a substantially horizontal direction and acts as an overbalance to automatically engage the latch with the impeller when the latter returns to its receptive position. The upper end of the latch is in the path of the car entering the impeller F from the branch 13 and is pushed forwardly and disengaged by the car, thus unlocking the impeller. 29[a] represent spaced guides for the latch G.

The impeller, after being unlocked is power-oscillated from its receptive position into its discharge position, and immediately returned to its receptive position and held locked therein until again released by the car on its next trip.

The impeller is oscillated by means of a crank 30 on the driving shaft 31 of the

spring motor H mounted on the floor 3, the wrist pin of said crank engaging a slot 32 in a web plate 33 depending from the member F. The slot 32 is of the contour shown in Figs. 3 and 4 so that the crank, revolving clockwise in Fig. 3 and counterclockwise in Fig. 4 will return the impeller at an accelerated speed, so as to insure its location in its receptive position before the return of the car.

The operation of my improved toy is as follows:

The toy automobile E, or other travelling element is placed on the spur 5 of the track-end B and travels by gravity down the branch 7, the connecting track D and up the branch 12 and the stem 11 to the bumper. The direction of travel is then reversed and the car runs down the stem 11 and the branch 13 and is deposited on the receiving track 19 and, by striking the latch G, unlocks the impeller. The motor then swings the impeller from its receiving position into its discharge position causing the car to run down the steep intermediate track portion 20 and off the discharge portion 21 with sufficient momentum to drive the car up the branch 6 and spur 5 against the bumper which reverses the travel of the car and returns it down the spur 5 and the branch 7, as above described. The impeller F, after discharging the car, is automatically returned and locked in its receptive position, ready for the next arrival thereon of the car.

It is evident that if the car or other travelling element were permitted to run along the impeller during its oscillation from its receptive to its discharge position, it would not acquire sufficient momentum to assure its ascent of the track end B and its proper return down the branch 7. Therefore, I provide means whereby the car or other travelling element, during the oscillation of the impeller, is held against movement at or adjacent to the receptive end of the impeller until the latter is approaching its discharge position; whereupon the car or other travelling element is released and discharged with the necessary momentum.

Thus, where the travelling element is a car, I may provide slots 34 in the floor of the portion 18 of the impeller, which slots are engaged by the front wheels of the car after the car has struck and released the latch G. These slots are of sufficient length to hold the wheels until the impeller is approaching its discharge position, when the angle of the portion 18 is sufficient to release the car from the slots, with the result that the car is projected onto the track end B with the necessary momentum. The angular character of the floor of the impeller F assists in this action, as the portion 18 which assumes the steepest angle serves to release the car, while the portion 20 forms a steep incline for gathering momentum and the portion 21 provides the necessary communication with the branch 6 of the track-end B.

Thus a continuous travel of the car is maintained until the stored power of the motor is dissipated. It is evident that an electric motor or any other suitable source of power may be substituted for the spring motor.

Although for the purpose of fully disclosing the principles of my invention, I have described in detail the embodiment thereof which is shown in the drawings, I do not wish to limit myself thereby, but claim broadly:—

1. In a mechanical toy, the combination with a travelling element of a track for said element having elevated ends, and an impeller interposed in said track for imparting momentum to said element sufficient to cause it to maintain a continuous travel from end to end of said track.

2. In a mechanical toy, the combination with a travelling element of a track for said element having elevated ends, and a power-driven impeller interposed in said track whereby sufficient momentum is imparted to the element to cause it to maintain a continuous travel from end to end of the track.

3. In a mechanical toy, the combination with a travelling element of a track for said element having elevated ends, one end being higher than the other end whereby the element will travel from the higher end to the lower end, and a power-driven impeller to impart sufficient momentum to the element to cause the element to travel back to the high end.

4. In a mechanical toy, the combination with a travelling element of a track for said element having elevated ends, one of said ends being higher than the other whereby said element will travel from the high end to the low end, and a power-driven impeller interposed in said track and adapted to impart sufficient momentum to said element to cause it to return to the high end.

5. In a mechanical toy, the combination with a travelling element of a track for said element having elevated single track ends and a double track intermediate portion, a power-driven impeller interposed in one of said intermediate tracks, and means at the track ends for automatically switching the element.

6. In a mechanical toy, the combination with a travelling element of a track for said element provided with elevated single track ends and a double track intermediate portion, automatic switching means at the ends of the double track portion, and a power-driven impeller interposed in the path of the element in one of the intermediate tracks for imparting momentum to the element.

7. In a mechanical toy, the combination

with a travelling element of a track for said element provided with elevated single track ends and a double track intermediate portion, means at the ends to switch the element from one track to the other, one of said track ends being higher than the other whereby the element will run by gravity from the high end along one of the intermediate tracks to the low end and be switched to the other intermediate track, and a power-driven impeller in the second intermediate track for causing the element to travel back to the high end.

8. In a mechanical toy, the combination with a travelling element of a track for said element provided with elevated single track ends and a double track intermediate portion, means at the ends to switch the element from one track to the other, one of said track ends being higher than the other whereby the element will run by gravity from the high end along one of the intermediate tracks to the low end and be switched to the other intermediate track, and a power-oscillated impeller interposed in the second intermediate track and adapted to engage the element and impart thereto sufficient momentum to return it to the high end.

9. In a mechanical toy, the combination with a travelling element of a track for said element provided with elevated single track ends and a double track intermediate portion, means at the ends to switch the element from one track to the other, one of said track ends being higher than the other whereby the car will run by gravity from the high end along one of the intermediate tracks to the low end and be switched to the other intermediate track, an impeller interposed in the second intermediate track, means whereby said impeller is normally maintained at rest in its receptive position, and means whereby when the element engages said impeller the latter is oscillated to propel the element toward the high end, and is then returned to its receptive position.

10. In a mechanical toy comprising a track structure for a travelling element, the combination of an extensible base, a pair of track ends detachably mounted on the ends of said base, and a connecting track section adapted to be detachably mounted in place to connect said track ends when the base is extended.

11. In a mechanical toy comprising a track structure for a travelling element, the combination of an extensible base, a pair of switch-back track ends mounted on said base, a track section adapted to be interposed between said track ends when the base is extended to complete one of the intermediate tracks, and a power-driven impeller interposed between the track ends to complete the other intermediate track.

Signed at Pittsburgh, Pa., this 5th day of February, 1924.

BENJAMIN F. BAIN.