

989,732.

H. P. TOWNSEND.
TOY.
APPLICATION FILED APR. 7, 1906.

Patented Apr. 18, 1911.

2 SHEETS-SHEET 1.

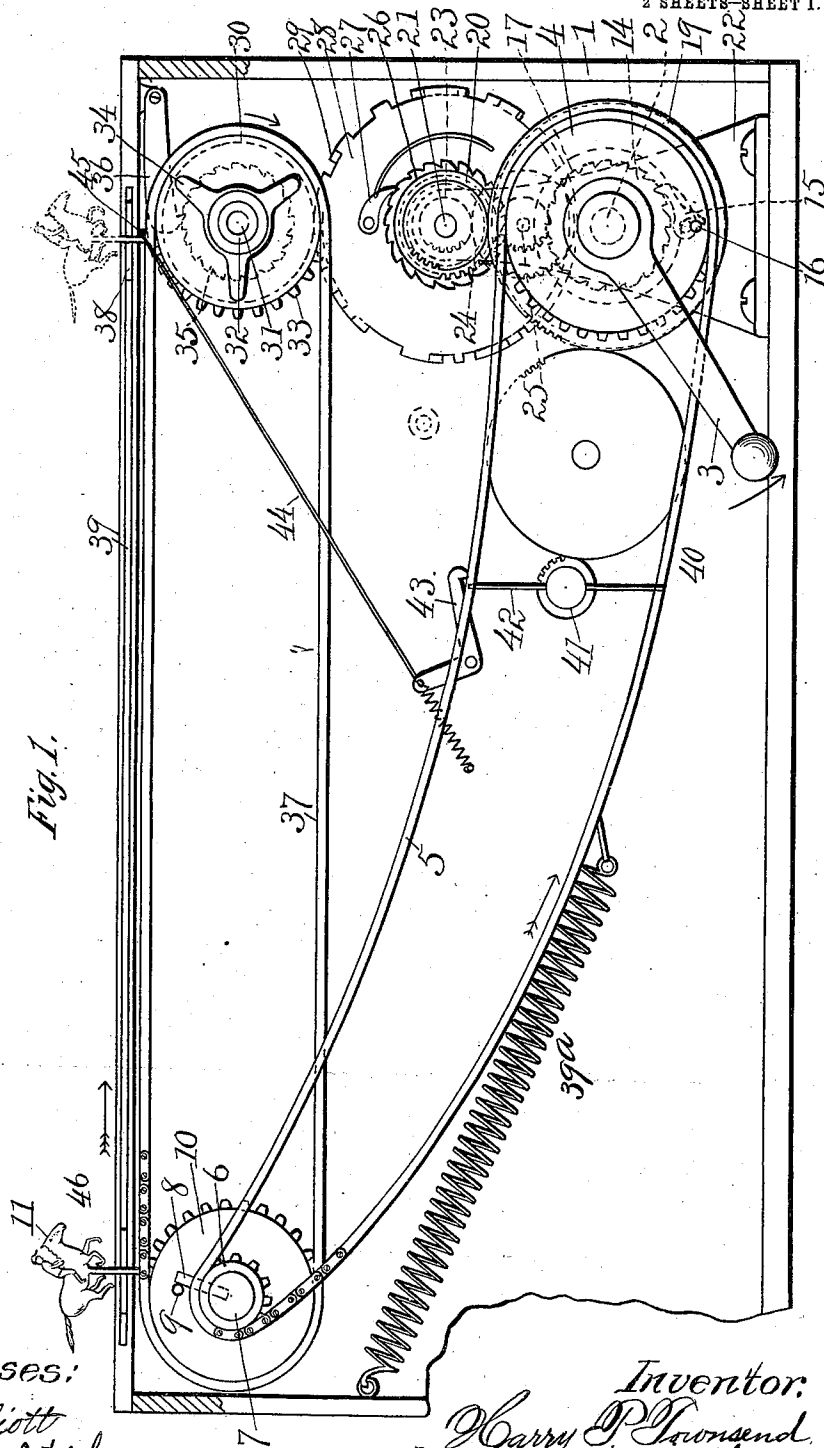


Fig. 1.

Witnesses:
F. H. Elliott
L. E. Berkovitch.

Inventor:
Harry P. Townsend.
By Arthur B. Jenkins
Attorney.

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2 SHEETS—SHEET 2.

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Fig. 6.

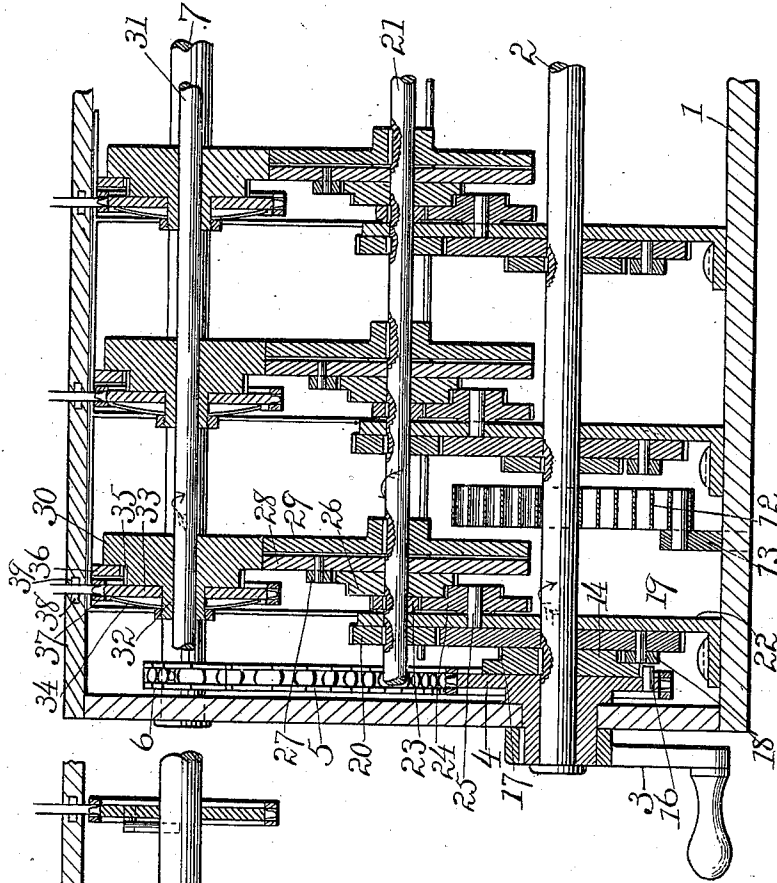
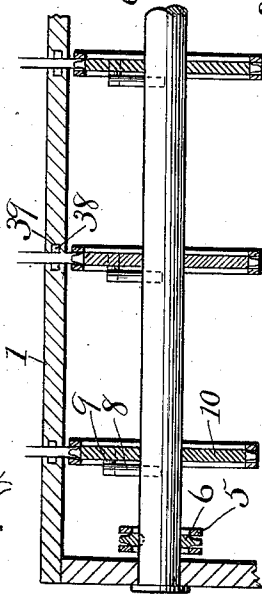


Fig. 3.



Witnesses:
F. H. Elliott
B. P. Berkovich.

Inventor:
Harry P. Townsend.
by Arthur B. Jenkins
Attorney.

UNITED STATES PATENT OFFICE.

HARRY P. TOWNSEND, OF NEW BRITAIN, CONNECTICUT.

TOY.

989,732.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY P. TOWNSEND, a citizen of the United States, and a resident of New Britain, in the county of Hartford and State of Connecticut, have invented a new Toy, of which the following is a specification.

My invention relates to that class of toys in which there is a semblance of a race between moving objects, and the object of my invention is to provide a toy of this class in which it will be practically impossible to determine in advance which object will arrive at a predetermined point before other objects; and a further object of the invention is to provide a toy of this class in which the mechanism is self acting to vary and control the speeds of the different objects. One form of device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of the mechanism inclosed within the case, one side wall of which is removed and the end walls are shown partially in section. Fig. 2 is a view in cross-section through said case, one side of which is broken off, the ends of a portion of the shafts being also broken off. Fig. 3 is a detail view in cross section through a portion of the case on a plane passing through the starting shaft.

In the accompanying drawings the numeral 1 denotes a case that may be constructed of any desirable material as wood or the like to inclose the operative parts of the mechanism. Within this case 1 a main driving shaft 2 is mounted, this shaft preferably extending crosswise of the case and being supported in the side parts thereof. Suitable means are provided for imparting to the shaft a primary movement, in the form shown a crank or handle 3 being secured to the shaft to serve this purpose. There are a number of moving objects having a relative movement to each other, and movement is imparted to these objects by mechanism connected with the main shaft, there being a separate mechanism for each object. For the purposes of brevity in description one of such mechanisms only will be described, it being understood that this description will apply equally to each or all of the mechanisms.

A primary driving sprocket 4 is mounted on, but having rotative movement independently of the shaft 2, in the form of de-

vice shown this shaft in fact being mounted in a hub of the sprocket, which hub is mounted in the side walls of the case and has the crank 3 secured thereto outside of the case, as clearly shown in Fig. 2 of the drawings. A chain 5 extends from the primary driving sprocket 4 to a sprocket 6 located on and keyed to the starting shaft 7, this shaft being employed for the purpose of placing the objects in position to start from the same line. A pin 8 secured to the starting shaft encounters a stud 9 on the path support 10 which is mounted to rotate independently of the shaft 7, for purposes to be hereinafter described.

The handle 3 is primarily moved in the direction indicated by the arrow in Fig. 1 to place all of the objects 11 at the starting point and also to rotate the shaft 2 to tension the main spring 12. This main spring is located in a suitable case, one end of the spring being secured to the shaft 2 and its other end to a stationary support 13. By tensioning the main spring sufficient power is obtained to rotate the shaft 2 and the several mechanisms connected therewith to cause the objects 11 to move in the direction indicated by the arrow in Fig. 1.

A ratchet wheel 14 is keyed to the main shaft 2, and has a nose 15 that, in the turning movement of the ratchet wheel, encounters a pin 16 extending from the side of the sprocket wheel 4. The teeth 17 on the ratchet wheel 14 engage with a pawl 18 pivoted at the side of a gear 19 loosely mounted on the main shaft 2. This gear 19 meshes with a pinion 20 keyed to an intermediate shaft 21 mounted in shaft supports 22 secured to the bottom of the case. A pinion 23 is also keyed to the intermediate shaft 21, this pinion meshing with a pinion 24 mounted on a stud 25 secured to the support 22. The pinion 24 is a double pinion, one set of teeth meshing with the pinion 23 and the other set meshing with the teeth of a gear 26 loosely mounted on the intermediate shaft 21. This gear 26 has ratchet teeth engaging with a pawl 27 pivoted to one, 28, of a number of path drivers. This path driver is in the form of a disk loosely mounted on the shaft 21, and there is a co-acting path driver 29 keyed to the shaft 21. These path drivers are of peculiar construction and are adapted to engage with and drive a path support 30 loosely mounted on a shaft 31. This path support has a

neck 32 on which the path supporting sprocket 33 is loosely mounted and held in frictional engagement with the support as by means of a spring 34. The path support 30 has teeth 35 which are engaged by a holding pawl 36 to prevent movement of the shaft support in one direction.

When the objects are at or near that end of their travel shown in dotted outline in Fig. 1 a movement of the handle 3 downward and to the right will rotate the driving sprocket 4, and through the medium of the pin 16 and nose 15 the ratchet wheel 14 will be rotated, turning the shaft 2 to wind the spring 12. In this movement the ratchet travels away from the pawl 18 so that the other engaging parts at this end of the case are not moved. As the handle is turned the chain 5 is caused to travel rotating the starting shaft 7. This will cause the pin 8 appurtenant to that path support 10 containing the object farthest advanced to first come in contact with its stud 9 and start the object backward. The several pins 8 will successively engage the studs on those path supports having the object next in the rear until the objects are brought into line and are all then simultaneously moved backward to the position shown in full lines in Fig. 1.

The path 37 is preferably in the form of a chain passing about the sprocket or path support 10 and the sprocket 33. The paths have lateral projections 38 engaging grooves 39 in the case for the purpose of preventing a sagging of the path and to cause it to travel in a direct line across the case. A spring 39^a having one end secured to the case and the other to the chain 5 causes the parts to be turned to their normal position after the spring has been wound and the objects moved to the starting point.

A governor consisting of a disk 40 pivoted in the case and having teeth meshing with the teeth on the gear 19, and a pinion 41 having teeth meshing with the teeth on the disk 40 is employed for steadying the movement of the figures. A fan 42 is secured to rotate with the pinion 41, and a spring retained pawl 43 mounted on the case is adapted to engage this fan. A connecting rod 44 extends from the pawl and has a pin 45 overlying the path and in position to be encountered by the support 46 of the object. There being a governor appurtenant to the mechanism for each of the moving objects it will be noted that that object which first arrives at the stopping point will engage and operate the pawl appurtenant to its path, and the entire mechanisms will therefore be stopped with the objects in the relative position they occupied when the one in advance operated the stopping mechanism.

The path drivers are of peculiar construc-

tion, as best shown in Fig. 1, the peripheries or teeth being cut away at different portions of the circumference, these cut away portions being of greater or less extent as may be desired. The cutaway portions are differently formed on each of the drivers appurtenant to a certain path, and they are also differently formed on each of the drivers appurtenant to the different paths.

It will be noted that through the mechanism illustrated the driver 29 is rotated at a faster rate of speed, being connected directly to the shaft 21, than is the driver 28, the speed of which is reduced through the intermeshing train of gears. When the driver 29 is rotating the support 30 the driver 28 will be carried along with it, the pawl 27 moving freely over the teeth of the ratchet 26. When, however, a cut away portion of the periphery of the driver 29 shall come opposite the support 30 and the periphery of the driver 28 shall be in engagement therewith then the support 30 will be driven at the slower rate of speed. If it shall happen that both of the drivers shall have a cut away portion located opposite the driver 30 at the same time then the support 30 will be momentarily stopped. It will thus be seen that the different objects may be driven at different speeds and that the speeds of each will vary, and that by arranging the drivers with the cut away portions differently positioned in each of the drivers appurtenant to a single path, and also in the drivers appurtenant to the different paths, that it will be impossible to tell which object will first arrive at the stopping point. When the handle is turned to place the objects at the starting point it will be noted that the pawl 36 will hold the support 30 against movement, but owing to the loose connection between the sprocket 33 and the support, the path and sprocket are allowed to turn independently of said support.

While I have shown herein an endless path as a means of supporting the objects my invention contemplates the use of paths of different form of construction which will convey the objects from a starting to a finishing point or goal and then replace the objects at the starting point for another trial. I also contemplate broadly any means by which the objects may have the same speed at the finishing point or goal as at the starting point, and for varying said speed in the travel of the object from the start to the finish; and my invention also contemplates any means for moving different objects between points located at the same distance apart during different intervals of time at different trials, each object at times being enabled to reach the finishing point before either of the others, and the mechanism being so constructed that it will be impossible to predetermine or select at any

trial the object which will cover the distance in the shortest time.

The small arrows shown in Fig. 2 of the drawings indicate the direction of rotation of the shafts to move the objects forward.

While the path supports shown herein are not of a sufficient size to carry an object entirely across the case, yet it will be understood that in actual practice they will be made of a sufficient size to accomplish this purpose.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A movable path supporting an object thereon, means for driving said path, connections between said path and driving means including a plural number of parts and a member to be driven thereby directly engaged with each of said parts, said connecting means being arranged to impart movement to said member at variable rates of speed during such engagement.

2. A movable path supporting an object thereon, means for driving said path, connections between said path and driving means including a plural number of parts moving at different rates of speed and a member directly engaged by each of said parts, said connecting means being arranged to impart movement to said member at variable rates of speed.

3. A movable path supporting an object thereon, means for driving said path, connections between said path and driving means including a plural number of parts moving at variable rates of speed and a member directly engaged by each of said parts, said connection being arranged to impart movement to said members when both of said parts are in engagement therewith.

4. A movable path supporting an object, means for driving the path, said means including a plural number of disks each connected with said member and arranged to cause each disk to move the path at a rate of speed different from that of another disk.

5. A movable path supporting an object thereon, means for driving the path, and connections between the driving means and path including a plural number of disks with an intermittent connection between a disk and the path.

6. A movable path supporting an object thereon, means for driving the path including a plural number of disks, each of which is intermittently connected with the path.

7. A movable path supporting an object thereon, means for driving the path, and connections between the driving means and path including a number of disks one of which moves at variable rates of speed, and intermittent connections between the disks and the path.

8. A movable path with an object supported thereon, means for driving the path,

and connections between the driving means and path including disks one of which moves at a constant rate of speed and the other of which moves at variable rates of speed.

9. A movable path supporting an object, means for driving the path, and connections between the driving means and path including a plural number of disks one of which moves at a constant rate of speed and the other moving at times at the same rate and at other times at a different rate therefrom.

10. A movable path supporting an object thereon, means for driving the path, and connections between the path and driving means including a plural number of disks so connected as to move at times at the same rate of speed and at other times at different rates of speed.

11. A movable path supporting an object, means for driving the path, and connections between the driving means and path including a plural number of disks one of which moves at a constant rate and is intermittently connected with the path and another of which is mounted to move independently of the path and loosely connected with the first-mentioned disk.

12. A movable path supporting an object, means for driving the path, and connections between the driving means and path including a plural number of disks one of which moves at a constant rate of speed and is intermittently connected with the path and the other of which moves at the same rate during the connection of the first-mentioned disk with the path, but moves the path at a different rate during said disconnection.

13. A movable path supporting an object, means for driving said path, and a plural number of connections between said path and driving means including a plural number of disks one adapted to move at a constant rate of speed and to be intermittently disconnected from the path and another adapted to move at a slower rate of speed during said disconnection, and means for causing the latter disk to travel at a slower rate than the other.

14. A movable path supporting an object, means for driving the path, and connections between the driving means and path including a plural number of disks one of which moves at a constant rate of speed and is intermittently connected with the path, and another of which is intermittently connected with the first-mentioned disk and also intermittently connected with said path.

15. A movable path supporting an object, connections between the driving means and path including a disk in frictional engagement with a connected part and with spaces in its periphery of a width to permit disengagement of the disk and said part, the connected part, and means for driving the disk.

16. A movable path supporting an object, means for driving the path, and connections between the driving means and path including a disk moving at a constant rate of speed during the operation of the parts, and a path support located between said disk and path to operate the latter, said disk being in engagement with said path support and having spaces in its periphery of a width to permit disengagement of the parts.

17. A path supporting an object, means for driving the path, connections between the driving means and path including a path support to operate the latter, and a plural number of disks each in engagement with said path support and with spaces in the periphery of a width to permit disengagement of the parts, and means for driving the disks.

18. A movable path supporting an object, means for driving the path, connections between the driving means and path including a path support to operate the latter, and a plural number of disks one of which engages a member and with spaces in its periphery of a width to permit disengagement of the parts, and another disk intermittently connected with the first-mentioned disk but adapted to move at a different rate of speed therefrom and operatively engaging said path support, and means for driving the disks.

19. A movable path supporting an object, a motor, connections between the motor and path for driving the object away from its initial or starting position, means connected with the motor and adapted when moved in one direction to energize the motor but disengaged therefrom when moved in another direction, and connections between said energizing means and the path for driving the object toward its initial or starting point.

20. A movable path supporting an object, a motor, connections between the motor and path for driving the latter in one direction, means for energizing the motor, and connections between the energizing means and the path for driving the latter in a different direction but allowing movement of the en-

energizing means in one direction independently of said path.

21. A movable path supporting an object, a motor, connections between the motor and path for driving the latter in one direction, means for energizing the motor, connections between the energizing means and the path for driving the latter in a different direction, but allowing movement of the energizing means in another direction independently of said path, and means for returning the energizing means to its position of rest.

22. A plural number of movable paths each supporting an object, means for driving said paths, said means including a motor, means for energizing said motor, and means connected with the energizing means for simultaneously returning all of the objects to their initial or starting point.

23. A plural number of paths each supporting a moving object, driving means including a motor for said paths, connections between said motor and paths including frictional engaging means, means for energizing the motor, and means connected with the energizing means for simultaneously returning the objects to their initial or starting point.

24. A plural number of endless paths each supporting an object, means including a motor connected with the paths for driving them, means for energizing the motor, and means connected with said energizing means for returning all of said objects simultaneously to their initial or starting point on the same line.

25. A movable path supporting an object, means for driving said path, and connections between the driving means and path including a plural number of parts engaging a driven member, and connections between each of said parts and the driven member to cause each part to directly drive the driven member at a rate of speed different from that of the other part.

HARRY P. TOWNSEND.

Witnesses:

ARTHUR B. JENKINS,
LENA E. BERKOVITCH.