A. D. McFAUL.

TOY.

APPLICATION FILED MAR. 19, 1917.

1,263,262.

Patented Apr. 16, 1918.

2 SHEETS—SHEET 1.

FIG. 1

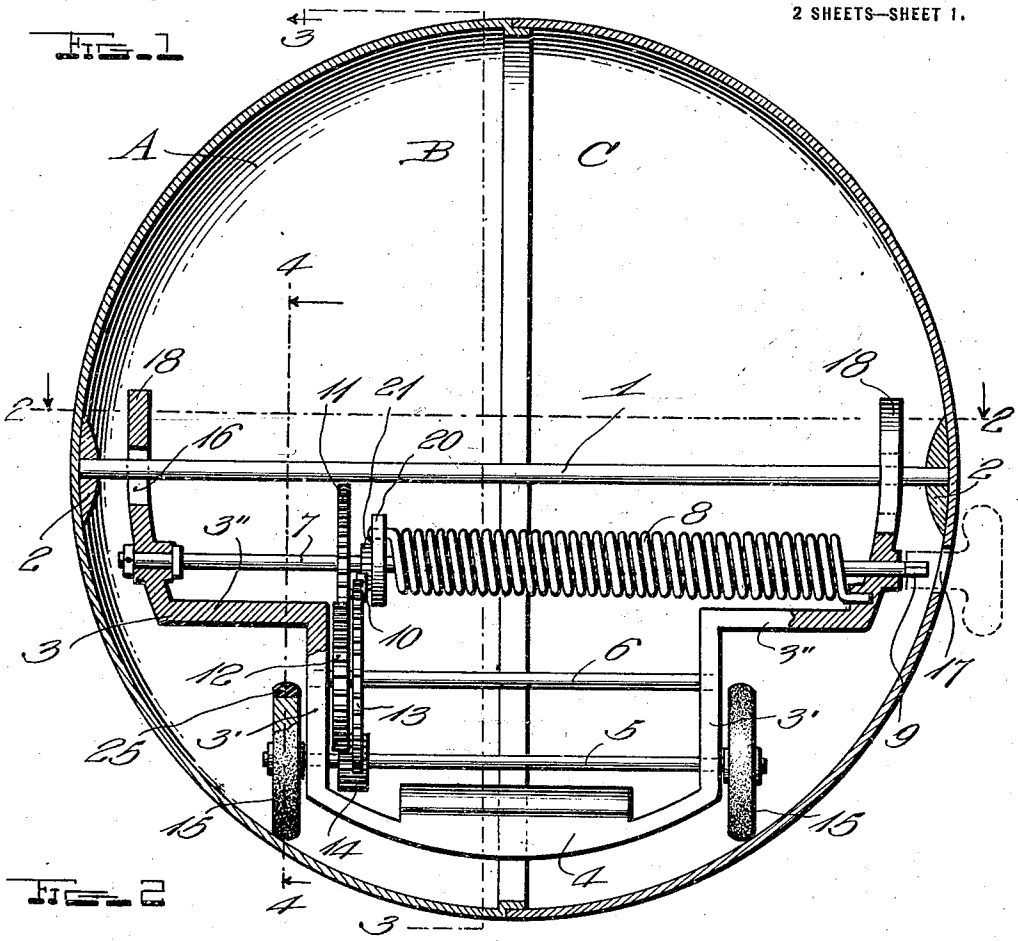
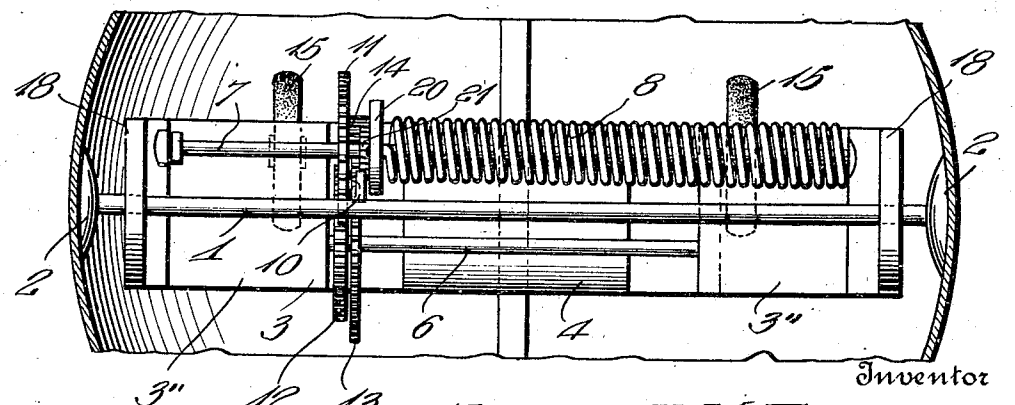


FIG. 2



Witness

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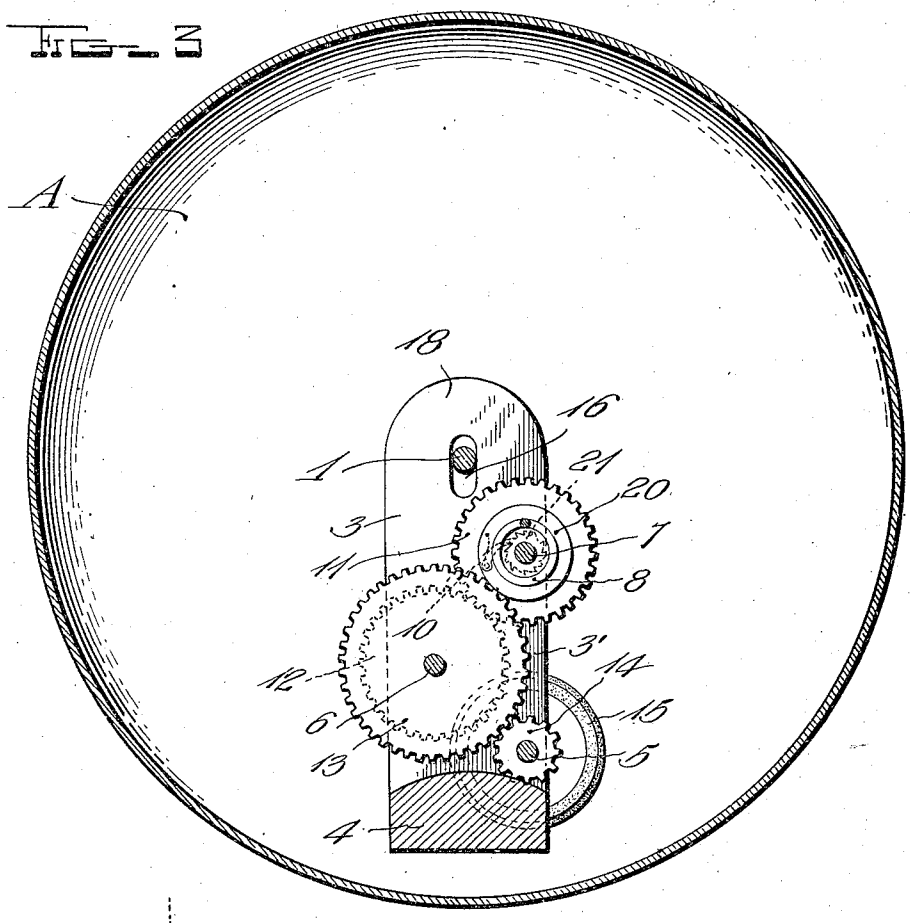
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2 SHEETS—SHEET 2.

FIG. 3



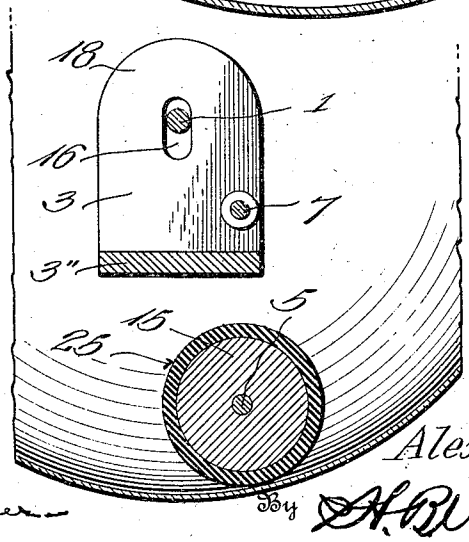


FIG. 4

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UNITED STATES PATENT OFFICE.

ALEXANDER D. McFAUL, OF MACHIAS, MAINE, ASSIGNOR TO MYSTIC BALL COMPANY, OF MACHIAS, MAINE, A CORPORATION.

TOY.

1,263,262. Specification of Letters Patent. **Patented Apr. 16, 1918.**

Application filed March 19, 1917. Serial No. 155,814.

To all whom it may concern:

Be it known that I, ALEXANDER D. McFAUL, a citizen of the United States, residing at Machias, in the county of Washington and State of Maine, have invented certain new and useful Improvements in Toys; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to toys and more particularly to that class of mechanical toys which comprise balls having internal mechanism for propelling them.

One object of this invention is to provide a device of this character which will propel itself in a straight line without any uneven jerks and starts characteristic of devices in present use.

Another object of my invention is to provide a device of this character which if it should be checked at any point in its path of travel by some obstacle, will automatically shift itself and continue in its movement, provided the size of the article be not too great.

A further object is to provide a toy of this character which may be easily taken apart without any unnecessary expenditure of time and labor on the part of the user.

A still further object of my invention is to provide a device of this character in which all possibility of the driving mechanism overturning within the shell of the ball, is avoided.

My invention is fully set forth in the following specification and claims taken in connection with the accompanying drawings in which like reference numerals indicate like characters.

Figure 1 is a central vertical section of a sphere embodying my invention;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1;

Fig. 4 is a detail vertical transverse section on the line 4—4 of Fig. 1.

As illustrated, A shows generally the usual type of sphere employed in devices of this character which comprises two hemispherical sections B and C. At diametrically opposed points on the inner surfaces of these sections B and C are located suitable socket members 2. Loosely positioned in these socket members and extending therebetween is a shaft 1. The driving mechanism for propelling the ball comprises a pair of wheels 15 in frictional engagement with the inner surface of the sphere. The wheels 15 are connected by a shaft 5 and to which adjacent one end is secured a pinion 14.

Carried by the shaft is a weighted framework 3 which comprises a U-shaped section having arms 3′ in which is journaled the shaft 5 near the lower end of these arms. These arms 3′ are continued upwardly to a point spaced well above the wheels 15 from which point they are bent outwardly from one another and parallel to the plane of the shaft 1 to a point spaced inwardly from the walls of the sphere forming portions designated as 3″. The outer terminals of these bent portions are struck arcuately upward to conform with the curvature of the inner surface of the sphere and are spaced at all points from the same to form members 18. These members 18 are provided with elongated slots 16 which are disposed in alinement.

The shaft 1 is adapted to register with and be positioned in the slots 16 which owing to their elongated construction allow of free vertical movement of the frame 3 and permit also of rocking motion of the frame on the shaft 1. It is strongly emphasized that the frame 3 is not in any way supported from the shaft 1 but is supported entirely by the wheels 15. The action of the shaft 1 in conjunction with the slots 16 in the members 18 is merely that of a guide which tends to maintain the frame 3 in a vertical position.

Secured between the members 18 of the frame 3 and positioned for rotatable movement therein is a shaft 7 extending through

the members 18 and projecting from one of said members and in alinement with an aperture 17 in the surface of the sphere. This portion of the shaft 7 located in alinement with the aperture 17 is squared as shown at 9 and adapted to receive a suitable winding key thereover. This shaft 7 is located below the shaft 1 and at one side of the arms 18 of the frame 3. This frame is constructed of sufficient width as to allow of the proper spacing of the shafts with the proper gearing mounted thereon as will be described later. Secured to this shaft is a collar 20 having a ratchet gear 21 secured on one face thereof. A coil spring 8 is positioned on this shaft 7 with its ends suitably attached to the collar 20 and to one of the members 18 of the frame 3. Loosely mounted on the shaft 7 is a gear wheel 11 which carries a suitably spring pressed pawl 10 on one face. This pawl 10 is adapted to be operated by the coöperating ratchet gear 21 for imparting rotation to the gear wheel 11 under action of the spring 8. Journaled in the arms 3′ and extending therebetween and spaced below the shaft 7 is an additional shaft 6 which carries adjacent one end a pinion 12 secured thereto in mesh with the gear 11 on the shaft 7. On this shaft 6 is also mounted a gear 13 in mesh with the pinion 14 secured on the shaft 5. This construction provides a train of gears for imparting motion to the wheels 15 which in turn, owing to their frictional engagement with the inner surface of the sphere, propel the ball forwardly.

A weight 4 is carried by the frame 3 at the lowest portion thereof. This provision of the weight 4 taken in connection with the weight of the gears and shafts of the frame 3 itself exerts a direct pressure on the wheels 15, keeping them constantly in engagement with the inner surface of the sphere. Owing to the arrangement of the elongated slots 16 movement of the motor carrying frame 3 about the shaft 1 as an axis is freely accomplished. Also by the construction of these slots, vertical movement of the frame is allowed. The wheels 15 are formed of any suitable material but are preferably provided with a rubber tire on their periphery designated at 25.

In the operation of my device, when a suitable key is inserted in the aperture 17 and positioned over the squared end 9 of the shaft 7, the spring may be wound and the mechanism set in operation. The weight 4 is sufficient to overcome any tendency of the frame 3 to ride around on the shaft 1 and overthrow the motor upon winding of the spring 8. When the spring has been wound and the ball is placed upon the surface on which it is to travel, the spring 8 will unwind, operating the train of gears from which motion will be transmitted to the wheel 15 which in turn, owing to their frictional engagement with the inner surface of the sphere will impart a rolling motion to the same. If at any point in the course of travel of this toy it should come in contact with an obstacle, it will, provided the obstacle is not too large, shift the frame 3 automatically in a lateral direction on the shaft 1. This is permitted by the spaced relation of the arms 18 with the inner surface of the sphere. Furthermore, if the shell of the sphere should be held stationary, the wheels will rise on the curved inner surface, forcing the arms 18 upwardly which being provided with the slots 16 permits of sufficient clearance therein to allow of a rise of the frame 3 in a vertical position. This rising of the frame will bring the wheels to a point where the pressure of the weight is exerted in a direction at an angle from the line of contact of the wheel with the inner surface of the sphere, thereby preventing the motor from overturning in the sphere.

By the foregoing, it will be seen that I have provided a device which is very simple in construction, cheap to manufacture, and easily operated. Particular emphasis is laid upon the fact that the two wheels 15 are widely spaced. By this arrangement, they contact with portions of the sphere A in spaced relation with the portion thereof which travels upon the floor. Obviously, the farther the wheels are spaced from the tread portion of the sphere, the shorter the paths of travel thereof will be. This is highly advantageous, since although the wheels in question rotate upon rather short annular paths, they will drive the device a maximum distance, and thus the spring 8 need only be wound a minimum amount.

I claim:

1. In a mechanical toy, a hollow sphere, a pair of axially alined wheels resting on the inner sides of said sphere, and a spring motor for driving said wheels, said wheels being widely spaced to travel on annular paths of much less diameter than that of the sphere, whereby maximum travel with minimum winding of the spring motor is obtained.

2. In a mechanical toy, a hollow sphere, a pair of widely spaced driving wheels resting on the inner surface of said sphere on opposite sides of its tread portion, an axle extending between said wheels, a U-shaped metal frame whose horizontal bar is disposed below said axle and provided with a weight, said axle passing through the lower portions of the vertical arms of said frame and the upper ends of said arms being off-set outwardly from said lower portions thereof, a spring motor operatively connected with said axle and including a plurality of shafts

extending between said arms of the frame, and an additional shaft located on the horizontal axis of the sphere and attached at its ends to said sphere, the upper ends of the arms of said frame having vertically elongated slots through which said additional shaft passes loosely.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALEXANDER D. McFAUL.

Witnesses:

LUCINDA E. ARMSTRONG,

HAROLD A. COOK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."