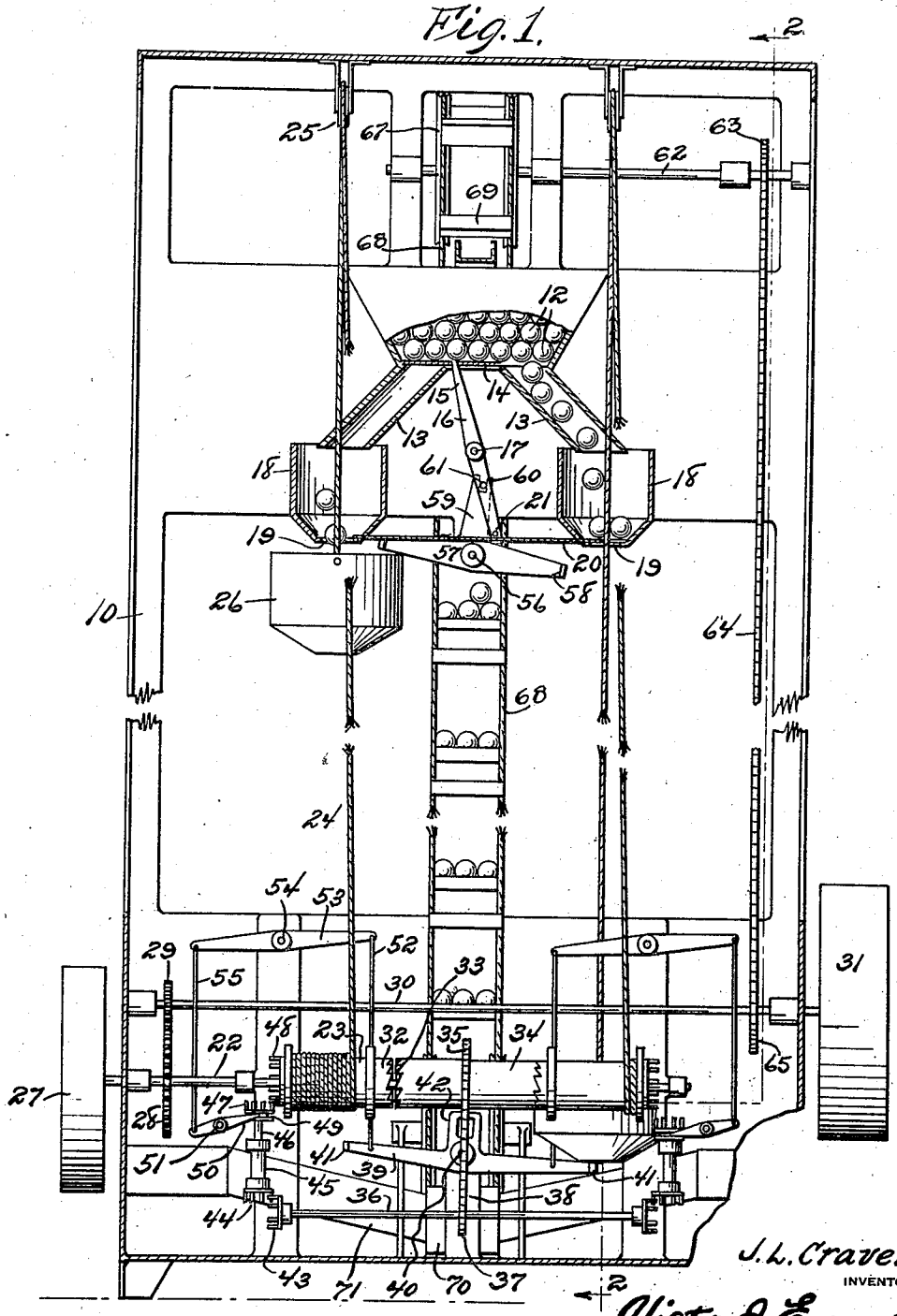
May 31, 1927. 1,631,016

J. L. CRAVEN

TOY MOTOR

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Fig. 1.



J. L. Craven
INVENTOR

BY Victor J. Evans
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WITNESS: Jno Donovan

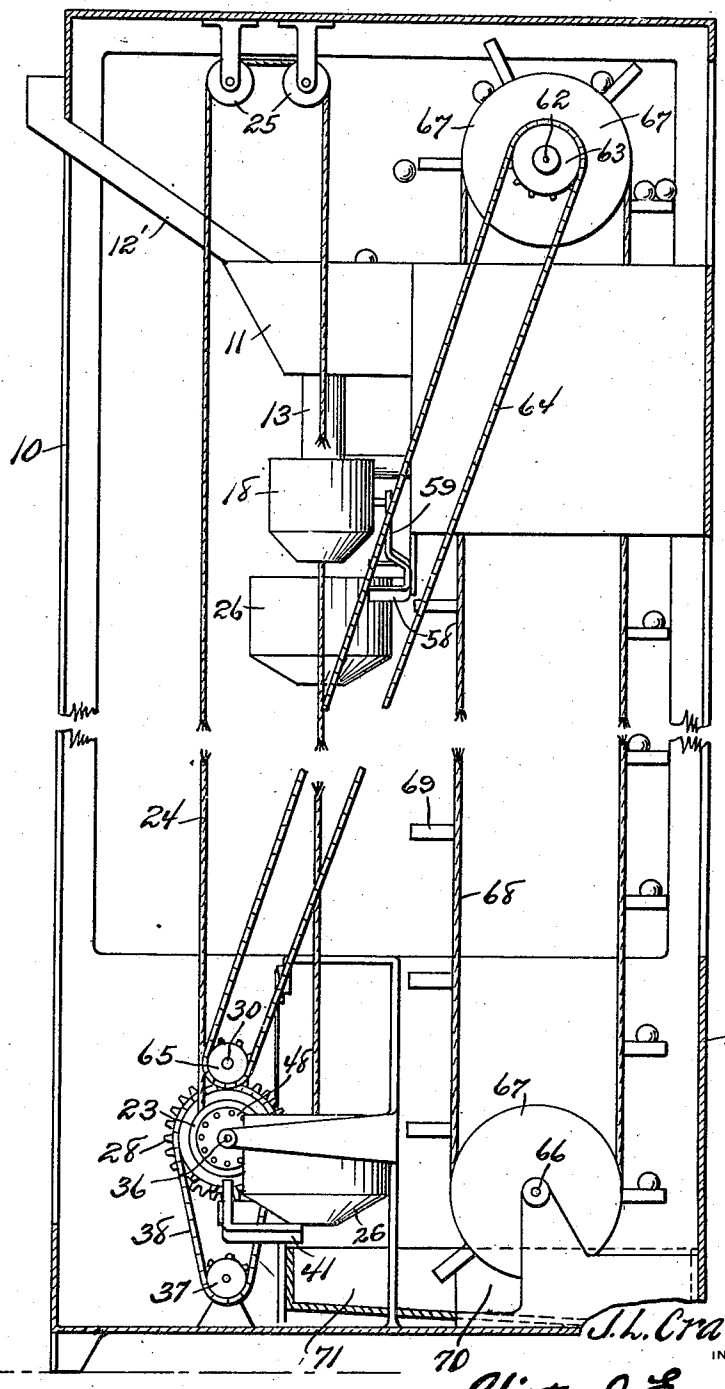
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Fig. 2.



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WITNESS: [illegible]

Patented May 31, 1927. 1,631,016

UNITED STATES PATENT OFFICE.

JOHN L. CRAVEN, OF INDIANAPOLIS, INDIANA.

TOY MOTOR.

Application filed January 23, 1925. Serial No. 4,349.

This invention relates to toy motors, and has for its object the provision of a novel mechanism designed to be propelled by a plurality of balls such as marbles which may be fed into the device through a suitable chute, the device embodying a large number of moving parts which will be extremely interesting to watch during the operation.

An important object is the provision of a mechanism of this character in which the parts are so arranged that the balls which constitute the active means will be returned to their initial position and used over and over.

An additional object is the provision of a toy motor of this character which will be comparatively simple and inexpensive to make, easy to install, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction and arrangement to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical section through the casing showing a confronting elevation of the mechanism.

Figure 2 is a section on the line 2—2 of Figure 1.

Referring more particularly to the drawings, I have shown the device as comprising an upstanding preferably rectangular frame 10 within the upper part of which is located a suitable support hopper 11 designed to contain balls 12 which might be marbles if desired. This hopper is intended to be filled by means of a chute 12′ leading to or from the front of the frame at the top thereof. Leading from the bottom of the hopper are outwardly diverging outlet chutes 13 with which communication is controlled by means of a slidably mounted plate 14 having a slot within which engages the upper end 15 of a lever 16 pivoted intermediate its ends as shown at 17. Mounted beneath the chutes 13 are receivers 18 having outlet openings 19 controlled by means of a plate 20 with which the lower end of the lever 16 is pivotally connected as shown at 21. Obviously when the lever 16 is rocked, the plates 14 and 20 will be moved alternately in opposite directions for permitting the balls to pass into the chute 13 and from thence into the receivers 18.

Journaled at the lower portion of the frame is a shaft 22 on which is rotatably mounted drums 23 to which are secured and about which are wrapped cords or other flexible members 24 which are led over guide pulleys 25 at the top of the frame and which carry buckets 26 adapted to receive the balls discharged from the members 18. The cords 24 are so arranged upon the drums that while one bucket is descending, the other is ascending. At one end the shaft 22 is shown as equipped with a fly wheel 27 and near its end it carries a spur gear 28 meshing with a pinion 29 on a shaft 30 which likewise carries a fly wheel 31.

The drums 23 carry clutch faces 32 adapted to be engaged by clutch faces 33 on the ends of a sleeve 34 which is splined upon the shaft 22 and which carries a sprocket 35.

Journaled below the shaft 22 is a shaft 36 carrying a sprocket 37 about which is trained a chain 38 which is in turn trained about the sprocket 35. The clutch shifting means comprises a double ended lever 39 pivoted at 40 and having its ends rearwardly extended as shown at 41 and disposed in the path of movement of the buckets 26 so that the lever will be rocked in one direction or the other as each bucket reaches its lowest position. The lever 39 carries arms 42 engaging against opposite sides of the sprocket 35 and consequently the sleeve 34 will be shifted to engage the clutches at one end or the other.

On the ends of the shaft 36 are gears 43 which mesh with gears 44 on the lower ends of sleeves 45 within which are splined shafts 46 carrying gears 47 adapted to mesh with gears 48 at the outer ends of the drums 23. The gears 47 have grooved collars 49 engaged by levers 50 which are pivoted at 51. Pivotally connected with the ends of the lever 39 are links 52 which are pivoted upon the ends of double ended levers 53 which are pivoted centrally at 54 and which have their other ends carrying links 55 connected with the levers 50. When the free end of the lever 39 is moved downwardly by engagement of a bucket therewith, the outer end of the lever 53 connected therewith will move upwardly and the gear 47 associated

therewith will be slid down out of mesh with the adjacent gear 48. This is done in order to provide for rotation of the shaft 36 always in the same direction as otherwise the movement would be reversed.

Pivoted at 56 below the plate 20 is a lever 57 having forwardly extending ends 58 positioned in the path of movement of the buckets so that the lever will be rocked as the buckets ascend. The lever 57 carries an arm 59 forked at 60 and engaging a pin 61 on the lever 16 so as to swing the latter and operate the plates 14 and 20.

Journaled at the upper portion of the frame is a shaft 62 carrying a sprocket 63 engaged by a chain 64 trained about a sprocket 65 on the shaft 30. At the lower portion of the frame is a shaft 66 directly below or in line with the shaft 62. The shafts 62 and 66 carry wheels 67 about which are trained cords or flexible members 68 carrying buckets 69. At the lower portion of the frame is a collecting hopper 70 through which the buckets 69 pass, and leading to this hopper are receiving chutes 71 located below the lowest points reached by the buckets 26 so as to receive the balls discharged therefrom and to conduct the balls into such position that they may be engaged and lifted at the buckets 69 of the endless carrier.

In the operation, the hopper 10 is initially filled with balls 12 and the device is set in motion as for instance by pulling upon one of the flexible members 24. When a bucket 26 ascends, it will engage the lever 57 and rock it so that the forked arm 59 thereon engaging the lever 16 will rock the lever and this movement results in sliding the plates 14 and 20 in opposite direction, permitting the balls to pass into one of the receivers 18. At this time the bottom of the receiver into which the balls fall is closed while the bottom of a previously filled receiver is opened by movement of the plate 20. Balls accumulated within the receiver and permitted to drop therefrom by the movement of the plate 20 will pass into the bucket 26 which is at its highest position, whereupon this bucket will descend, while the other will ascend and cause rotation of the associated drum 23. At this time this drum has its clutch face in engagement with the clutch face 33 at one end of the sleeve 34 so that as the drum rotates the sleeve 34 will rotate. Upon striking the lateral projection 41 on the end of the lever 30, the bucket will tip and the marbles or balls therein will spill out into the chute 71 and pass to the hopper 70 so as to be engaged by the buckets 69 and lifted to the top of the frame, at which point the balls will drop from the buckets back into the hopper 11. When a descending bucket strikes against the lever 39, the latter is rocked, and the arms 42 thereon engaging the sprocket 35 will lift the sleeve 34 to engage the clutch device at the outer end thereof, thus making the other drum active. The rotation of the inactive drum is connected by the gears 48 and 47 and the gears 44 and 43 to the shaft 36 which being connected by the sprockets and chain with the drum 34 will assist in rotating the latter. The downward movement of either end of the lever 39 connecting the link 52 and associated lever 53 will operate through the link 55 and lever 50 to shift the gear 47 into or out of mesh with the associated gear 48 as the case may be. The action is automatic and continuous as long as there is a supply of balls within the hopper 11 and this supply must, of course, be replenished from time to time by feeding in more through the chute 12, it being contemplated that means be provided whereby access may be had to the interior so that used balls may be withdrawn from the hopper 70 inasmuch as they will accumulate therein faster than they can be moved upwardly by the buckets 69.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a very interesting and entertaining toy which is bound to be attractive to the youthful mind.

Having described the invention, I claim:—

1. In a device of the character described, a hopper having a pair of discharge chutes in its bottom, receivers located beneath said chutes, slidable plates controlling communication to the chutes and from the receivers, trip operated means connected with said plates for sliding the same in opposite direction, a shaft, a pair of drums thereon, flexible members secured to and wrapped about said drums and trained over guide pulleys at the top of the device, buckets carried by said flexible members and adapted to receive from said receivers, balls within the hopper adapted to pass into the buckets alternately for weighting the same, an elevator carrier discharging into the hopper, and an operative connection between the drums and said elevator carrier.

2. In a device of the character described, a hopper having a pair of discharge chutes in its bottom, receivers located beneath said chutes, slidable plates controlling communication to the chutes and from the receivers, trip operated means connected with said plates for sliding the same in opposite direction, a shaft, a pair of drums thereon, flexible members secured to and wrapped about said drums and trained over guide pulleys at the top of the device, buckets carried by said flexible members and adapted to receive from said receivers, balls within the hopper adapted to pass into the buckets alternately for weighting the same, an elevator carrier discharging into the hopper, and an opera-

tive connection between the drums and said elevator carrier, including a sleeve splined upon said shaft and having clutch faces, clutch faces on the drums and trip operated means for receiving the sleeve.

3. In a device of the character described, a hopper having a pair of discharge chutes in its bottom, receivers located beneath said chutes, slidable plates controlling communication to the chutes and from the receivers, trip operated means connected with said plates for sliding the same in opposite direction, a shaft, a pair of drums thereon, flexible members secured to and wrapped about said drums and trained over guide pulleys at the top of the device, buckets carried by said flexible members and adapted to receive from said receivers, balls within the hopper adapted to pass into the buckets alternately for weighting the same, an elevator carrier discharging into the hopper, and an operative connection between the drums and said elevator carrier, a counter shaft operatively connected with the sleeve, gear connections between the drums and the counter shaft and means for locking either drum for rotation upon its shaft.

In testimony whereof I affix my signature.

JOHN L. CRAVEN.