

(No Model.)

H. B. SCHUREMAN.
MOTOR FOR TOYS.

No. 409,806.

Patented Aug. 27, 1889.

Fig. 1.

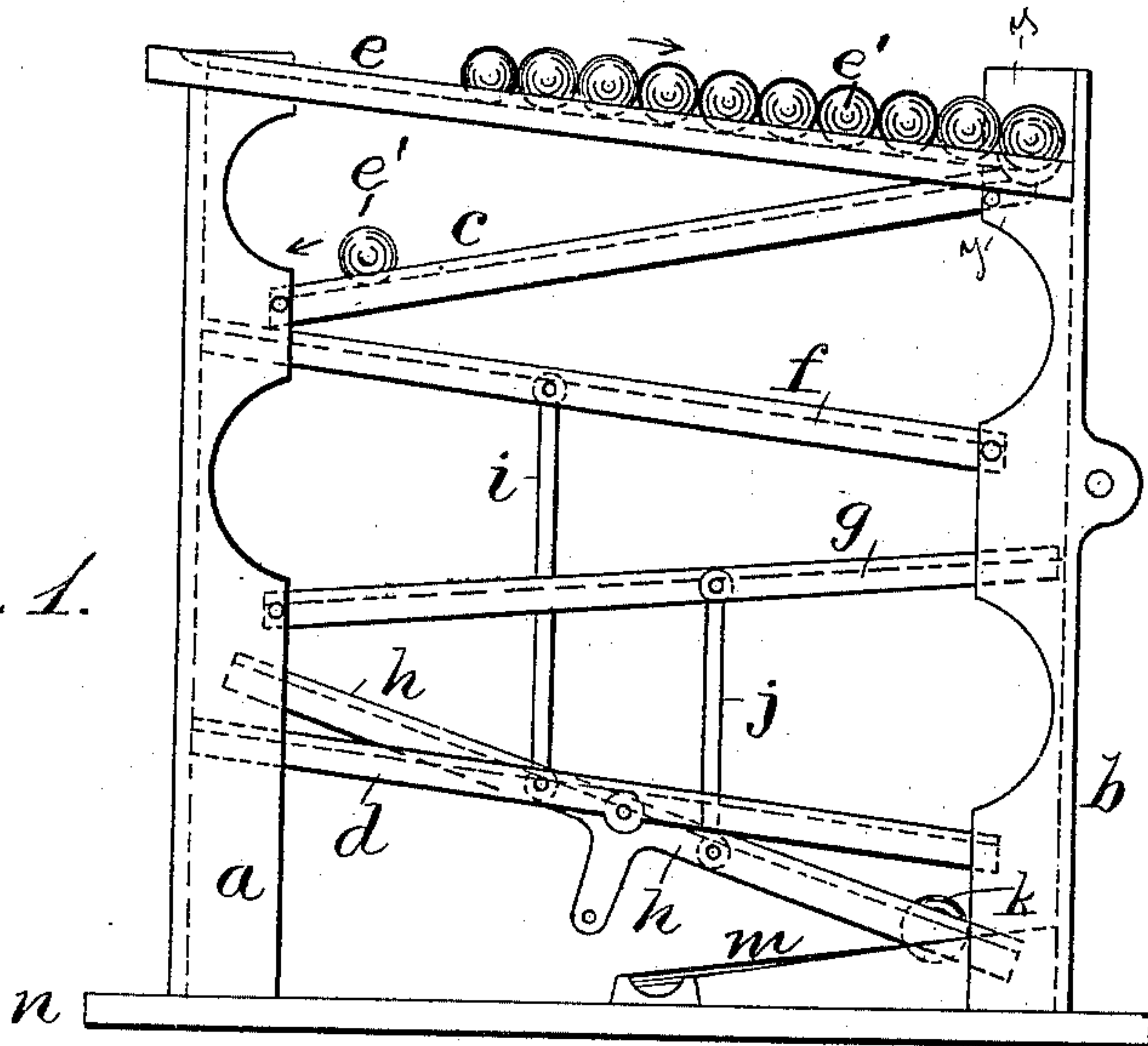


Fig. 2.

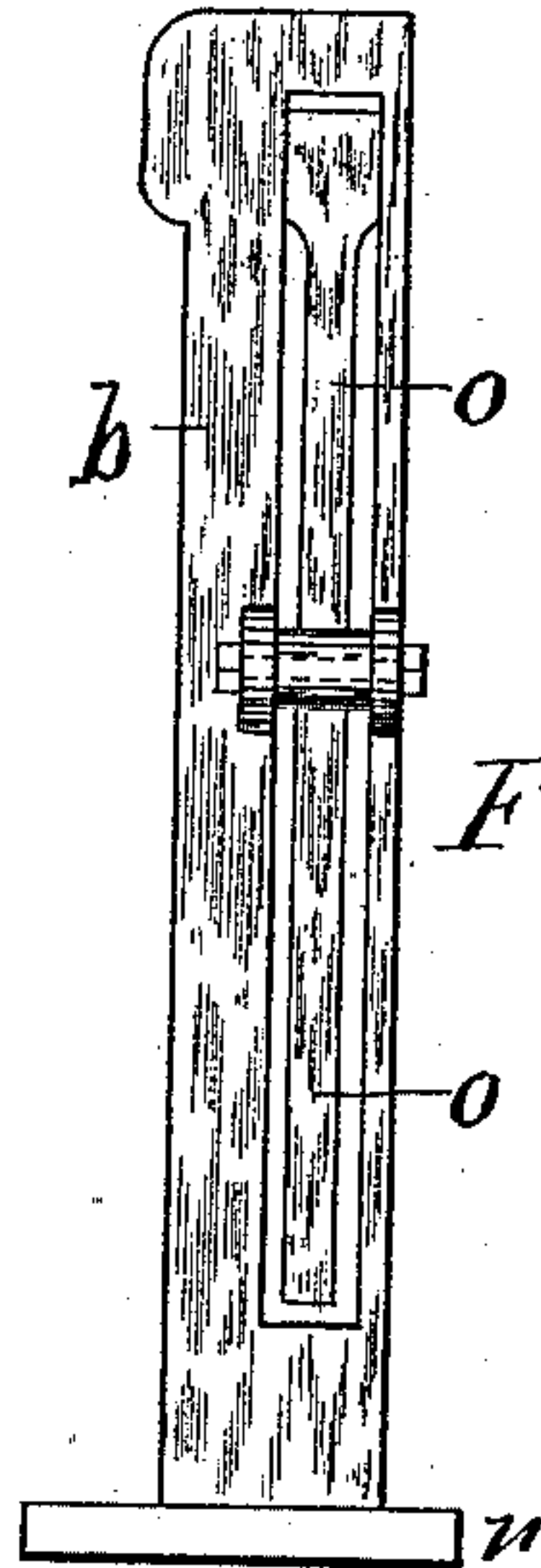


Fig. 3.

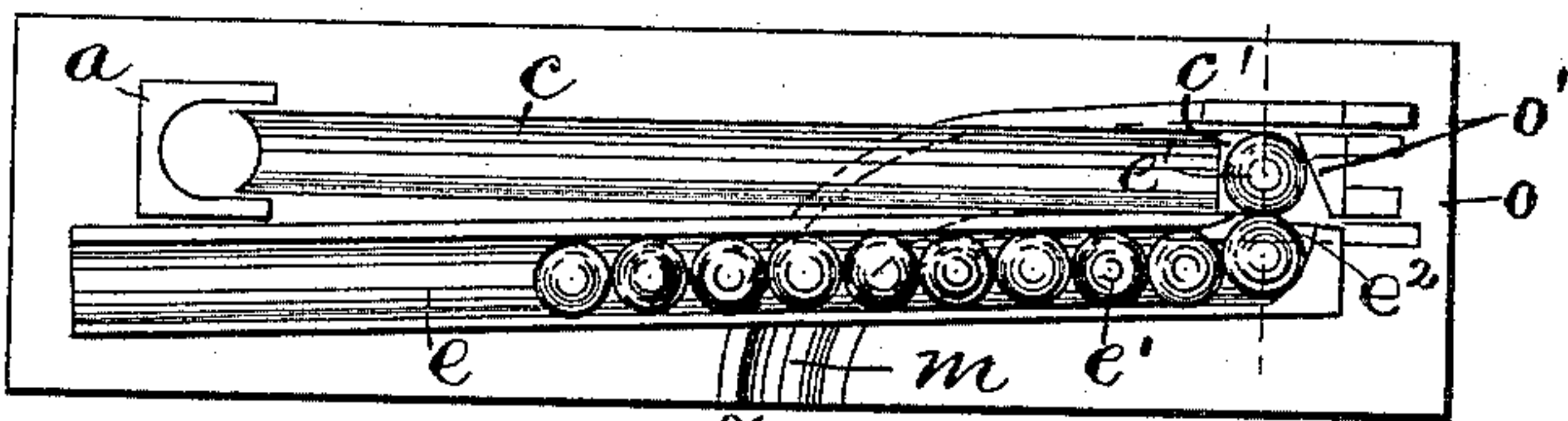


Fig. 6.

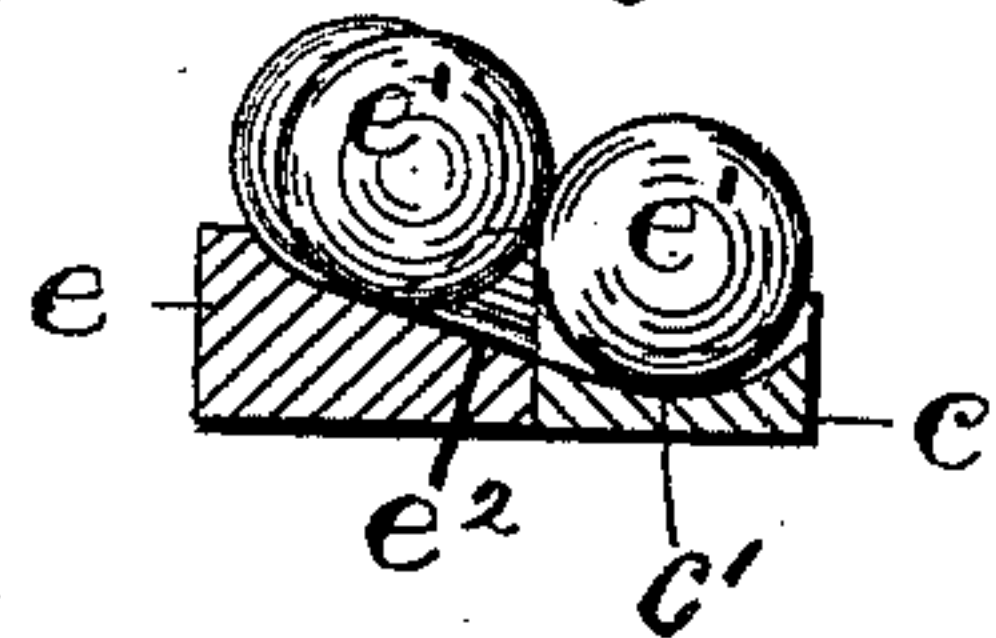


Fig. 4.

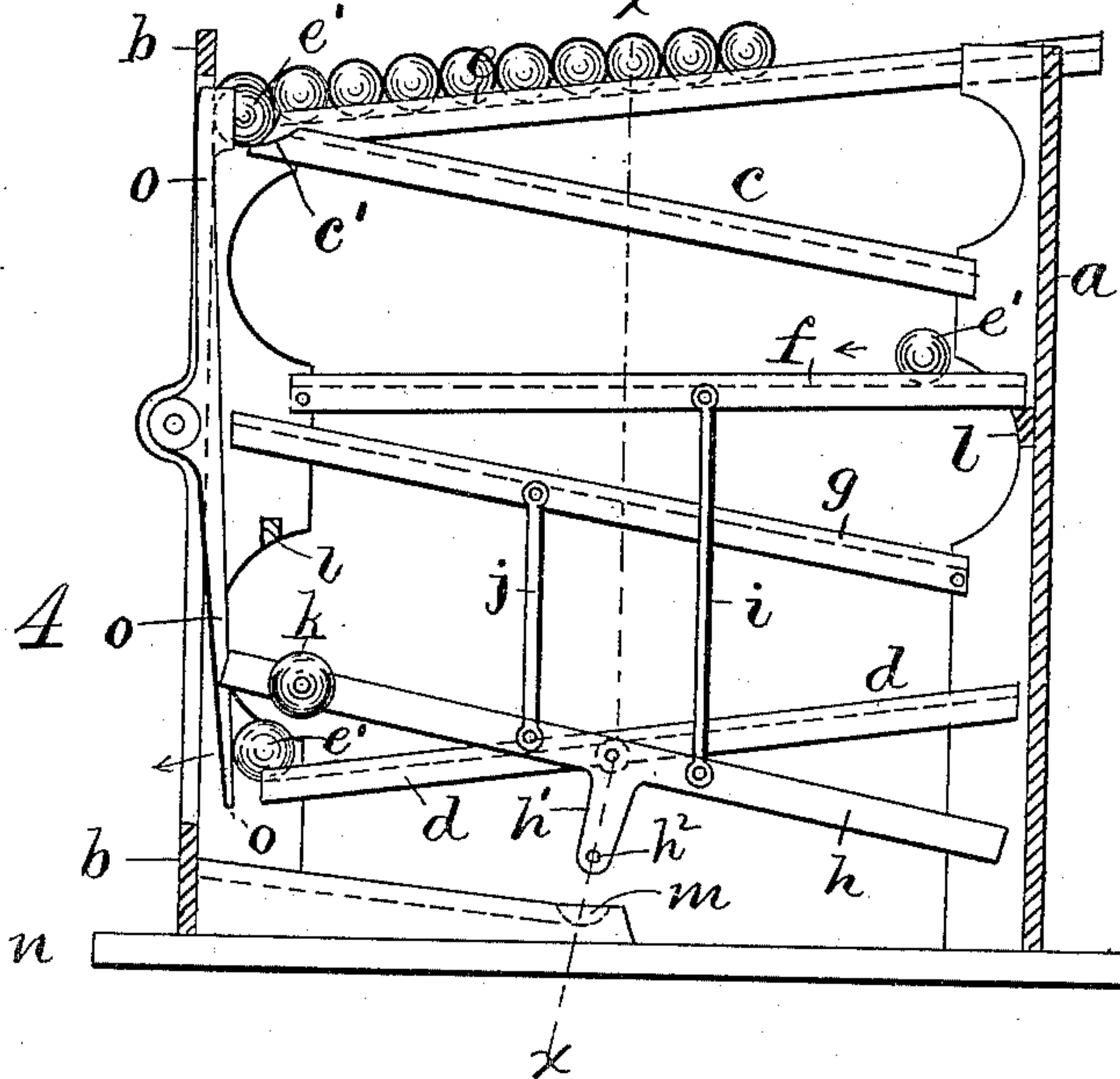
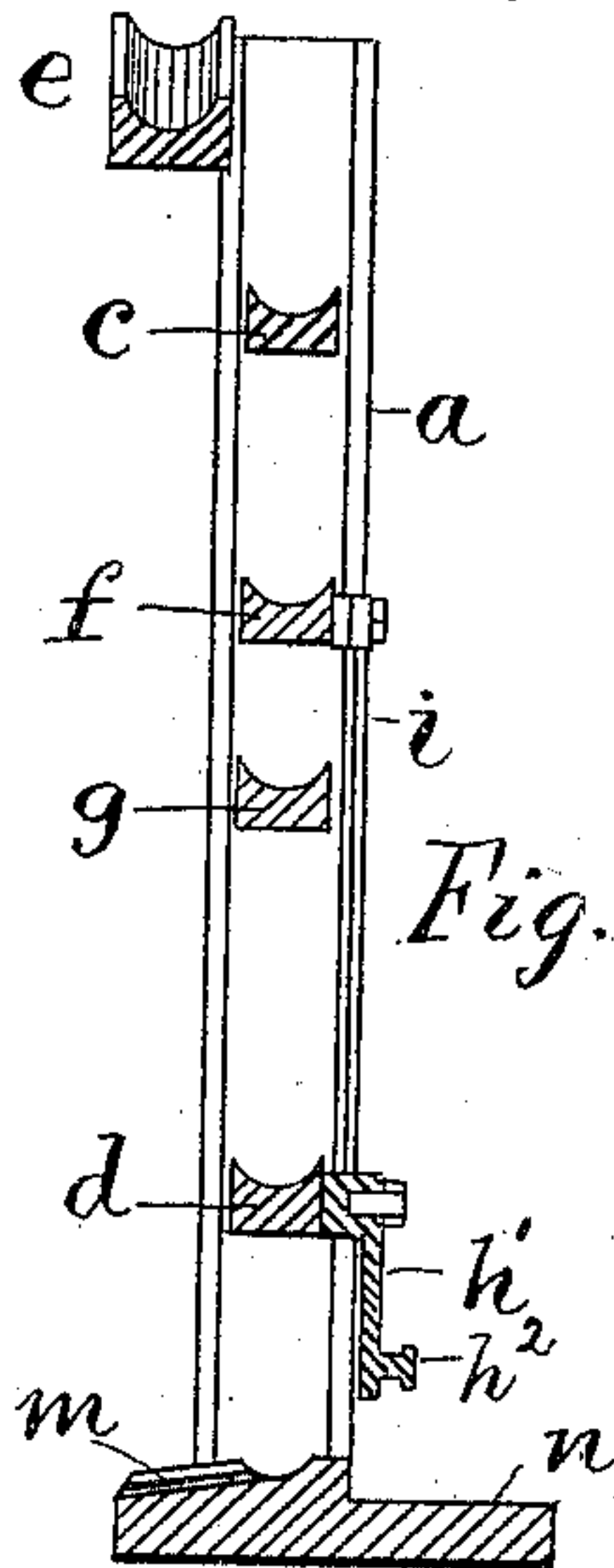


Fig. 5.



Attest:
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UNITED STATES PATENT OFFICE.

HOWARD B. SCHUREMAN, OF NEWARK, NEW JERSEY.

MOTOR FOR TOYS.

SPECIFICATION forming part of Letters Patent No. 409,806, dated August 27, 1889.

Application filed December 15, 1888. Serial No. 293,674. (No model.)

To all whom it may concern:

Be it known that I, HOWARD B. SCHUREMAN, a citizen of the United States, residing at Newark, Essex county, New Jersey, have
5 invented certain new and useful Improvements in Motors for Toys, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 The object of this invention is to furnish a motor for use in operating a variety of toys; and the construction consists in a combination of pivoted troughs with certain guides or
15 guide-troughs adapted to lead a series of balls one by one into the upper ends of such troughs, the weight of the ball operating, in each movable trough, to reverse a lever upon
20 the motor and thus adapting it to transmit a reciprocating or oscillating motion. Such motion may be used to actuate toys of various kinds; but as such oscillating or reciprocating toys are already well known, and the means of connecting the same with the lever
25 upon my motor may be varied indefinitely, I have not shown any of such toys in my present application.

In the annexed drawings, Figure 1 is a front elevation of the motor; Fig. 2, a vertical edge view of the same; Fig. 3, a plan of
30 the motor. Fig. 4 is a rear elevation of the motor, with the rear sides of the hollow posts removed; and Fig. 5 is a vertical section on line $x x$ in Fig. 4. Fig. 6 is a section of the troughs e and c upon line $y y$ in Fig. 1, showing
35 the inclined passage from one trough to the other.

The device may be modified in its external appearance, but is shown in its simplest form herein, with base n , and two hollow posts a
40 and b , connected near the top and bottom by two fixed troughs c and d , inclined in opposite directions. An inclined feeding-trough e is applied to the top of the posts, with its lower end adapted to discharge balls e' upon
45 the upper end of the trough c ; but the upper end of such trough is formed with a hollow or bevel c' , to retain each ball at such point until pushed forward into the descending
50 portion of the trough.

f and g are two pivoted troughs arranged between the troughs c and d and adapted to conduct the balls from the lower end of the
trough c to the upper end of the trough d .

The ends of the troughs are inclosed within the walls of the posts a and b , which operate
55 as guides to direct the balls in moving from one trough to another, and the lower end of each trough is shortened sufficiently to discharge the ball upon the upper end of the trough beneath it. The trough f is pivoted
60 at its lower end with its upper end movable to and from the lower end of the trough c , and the trough g is pivoted in like manner with its lower end adjacent to the higher end of the trough d , and its upper end movable
65 to and from the lower end of the trough f . The oscillating lever h is pivoted at its middle, and connected at opposite sides of its fulcrum by links i and j with the troughs f and g . The connecting-rods operate to move
70 the troughs f and g in opposite directions, and the weight of the trough f thus balances the weight of the trough g , so that the lever and troughs would be held in equilibrium in all
75 positions unless they were overbalanced by a weight k applied to the lever h to hold the trough f normally in its highest position. Such normal position of the parts is shown
80 in Fig. 1, with a series of balls e' in the trough e , and one ball rolling down the trough c to fall upon the upper end of the trough f .

In Fig. 4 the opposite side of the apparatus is shown with the rear sides of the hollow posts, which serve as vertical guides in direct-
85 ing the balls from one trough to the other, removed to expose the ends of all the troughs. Stops l are provided in the posts to arrest the movable ends of the troughs f and g at a suitable inclination, and in Fig. 4 the ball is shown
90 traversed from the trough c to the upper end of the trough f , with such end of the trough depressed by the weight of the ball into contact with the stop l , thus reversing the position of the lever h and lifting the movable
95 end of the trough g upward into proximity with the pivoted end of the trough f . It is obvious that the delivery of the ball upon the upper end of the trough g would depress it and operate immediately to reverse the lever
100 into the position shown in Fig. 1. When thus depressed, as shown in the trough f in Fig. 4 and the trough g in Fig. 1, the movable troughs are prevented by the stops l from falling too
105 low to discharge the ball by gravity from their lower ends to the succeeding trough,

and the ball is thus discharged into the upper end of the trough *d*, from whence it rolls to the lower end, and is thence delivered outside of the apparatus by a spout *m* upon the bed-plate *n*. The trough *d* is considerably inclined to give the ball a certain momentum, and the end of the trough is arranged to deliver the ball against the lower end of an arm *o*, pivoted at its middle upon the post *b*, and having its upper end extended adjacent to the top of the trough *c*, where the ball is retained prior to its descent by the incline *c'*. The momentum of the ball thus operates to push the bottom of the arm outward and its top end inward, thus shoving the ball over the incline *c'* into the descending portion of the trough *c*, which sets the ball into motion through the entire apparatus. The ball which strikes the lower end of the arm drops therefrom upon the bed *n*, and is guided outside of the same by the spout *m*, so that the operator may again place it in the feeding-trough *e*. The upper end of the arm *o* is formed, as shown in Fig. 3, with a sloping surface *o'*, inclined toward the sloping passage *e*², which delivers the balls from the trough *e*, and the downward movement of the balls in such passage, under the influence of gravity, after the ball lying upon the incline *c'* has been displaced, operates against the sloping surface *o'*, as shown in Fig. 3, to push the upper end of the arm *o* outward, as shown in Figs. 3 and 4, and replaces a fresh ball upon the incline *c'*, as shown in Figs. 3 and 4. Such movement of the upper end of the arm also resets the lower end of the lever in position to receive the impact of the ball from the trough *d*. In Figs. 3 and 4 the arm *o* is shown reset in such position and receiving the impact of the ball which has traversed the troughs *c*, *f*, *g*, and *d*, and by its operation upon the lower end of the arm *o* would shift the ball *e'* lying upon the incline *c'* into the upper end of the trough *c*.

In Fig. 1 the trough *f* is shown pressed upward by the normal action of the weight *k* upon the lever *h*; but in Fig. 4, in order to illustrate the opposite positions of the balls, the trough *f* is shown depressed, as it would be by the dropping of one of the balls upon its higher end. The normal action of the weight *k* would, as soon as the ball rolled from the trough *f*, shift the position of all the troughs to that shown in Fig. 1. The lever *h* is shown provided with a crank-arm *h'*, having a crank-pin *h*² adapted to transmit the oscillating motion of the lever *h* to any other mechanism, and the motor is thus adapted to produce vibratory or reciprocating motion, so long as the balls are supplied to the trough *e*. The upper end of the arm *o* is beveled upon the side adjacent to the trough *e*, and the passage *e*² from the trough *e* to the head of the trough *c* is sloped downward, as indicated in Fig. 6, sufficiently for the weight of the ball to operate effectively in pushing the arm outward, as shown in Fig. 3. As each ball is retained in the top of the

trough *c* and not discharged therefrom until the preceding ball has reached the lowest point in the machine and operates the lever *o*, it is obvious that the machine will work automatically so long as the supply of balls remains in the feeding-trough *e*.

The essential part of the invention is the combination, with suitable guides, of the oppositely-pivoted movable troughs *f* and *g*, counterbalanced by their connection at opposite sides of their pivot with the oscillating lever *h*; and it is therefore obvious that the movable troughs may be duplicated two, three, or four times in the same apparatus, if desired, without departing from the principle of the invention. The oscillating lever *h* may be arranged in any convenient position in relation to the movable troughs and connected therewith in any suitable manner, to operate them in opposite directions, as desired, the weight upon the lever also operating to automatically set the trough *f* in its working position before the first ball is fed to the apparatus.

Having thus set forth my invention, what I claim herein is—

1. In a toy motor, the combination, with suitable guides for leading the balls thereto, of the troughs *f* and *g*, inclined in opposite directions and pivoted at opposite ends, as described, the oscillating lever *h*, and the links *i* and *j*, connecting the troughs with the lever at opposite sides of its fulcrum, as and for the purpose set forth.

2. In a toy motor, the combination, with the fixed troughs *c* and *d*, of the movable troughs *f* and *g*, pivoted at opposite ends between the troughs *c* and *d* and inclined in opposite directions, guides to lead the ball from one trough to another, as set forth, the lever *h*, the links connecting the movable troughs with such lever at opposite sides of its fulcrum, and a weight upon the lever to normally raise the free end of the upper trough, substantially as herein shown and described.

3. In a toy motor, the combination, with the bed *n* and posts *a* and *b*, forming guides for the balls, as set forth, of the troughs *c*, *d*, and *e*, arranged as described, the latter having an inclined passage *e*², connecting the troughs *e* and *c*, and said trough *c* having the incline *c'* to retain the ball at the head thereof, the movable troughs *f* and *g*, pivoted as described, the lever *h*, linked to the troughs *f* and *g*, and the arm *o*, arranged as set forth, and operated to push the balls successively into the trough *c*, as and for the purpose set forth.

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

HOWARD B. SCHUREMAN.

Witnesses:

L. LEE,

H. J. MILLER.