

(No Model.)

G. OTTO.

MECHANICAL MOVEMENT FOR TOYS.

No. 248,205.

Patented Oct. 11, 1881.

Fig. 1.

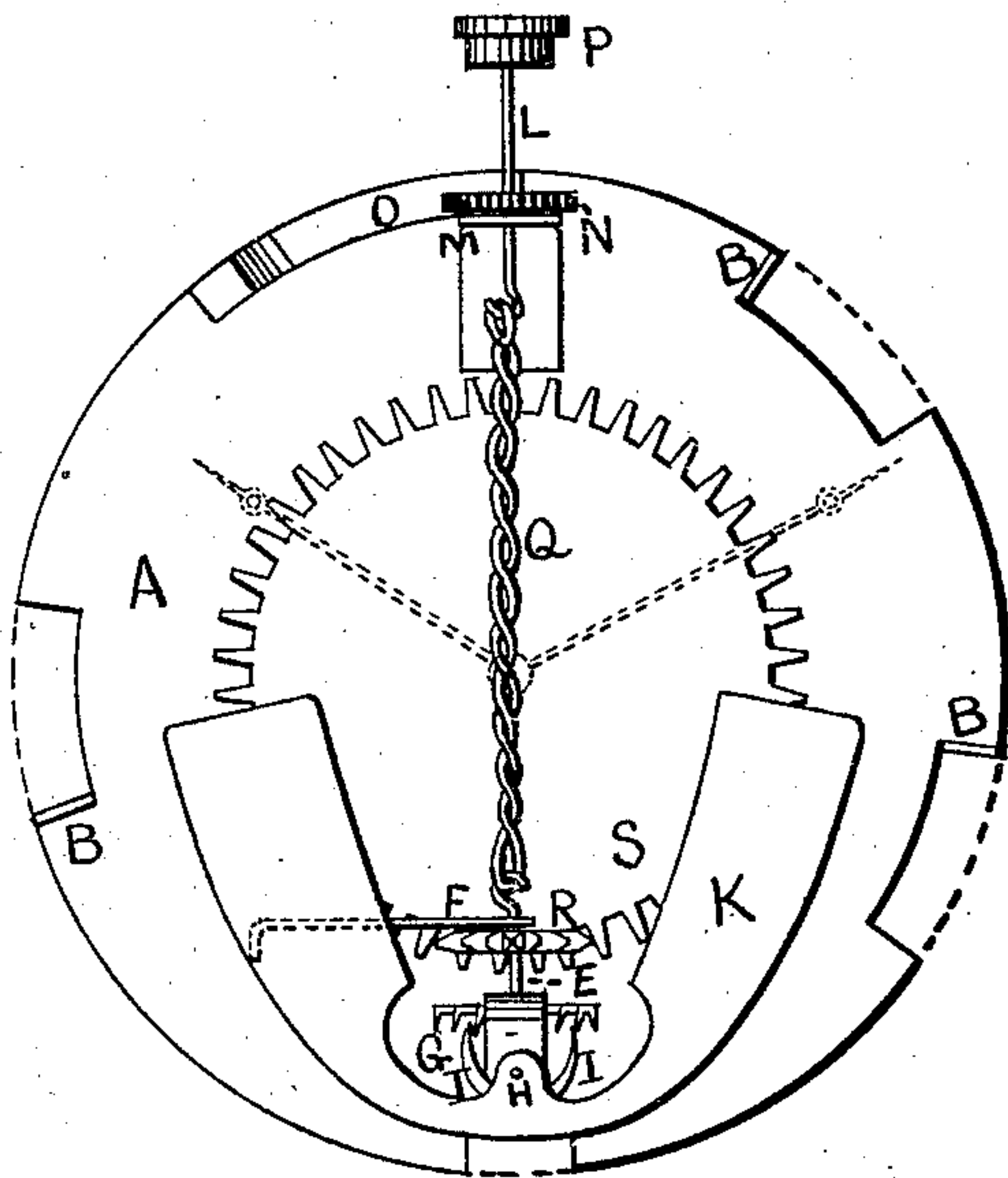


Fig. 2.

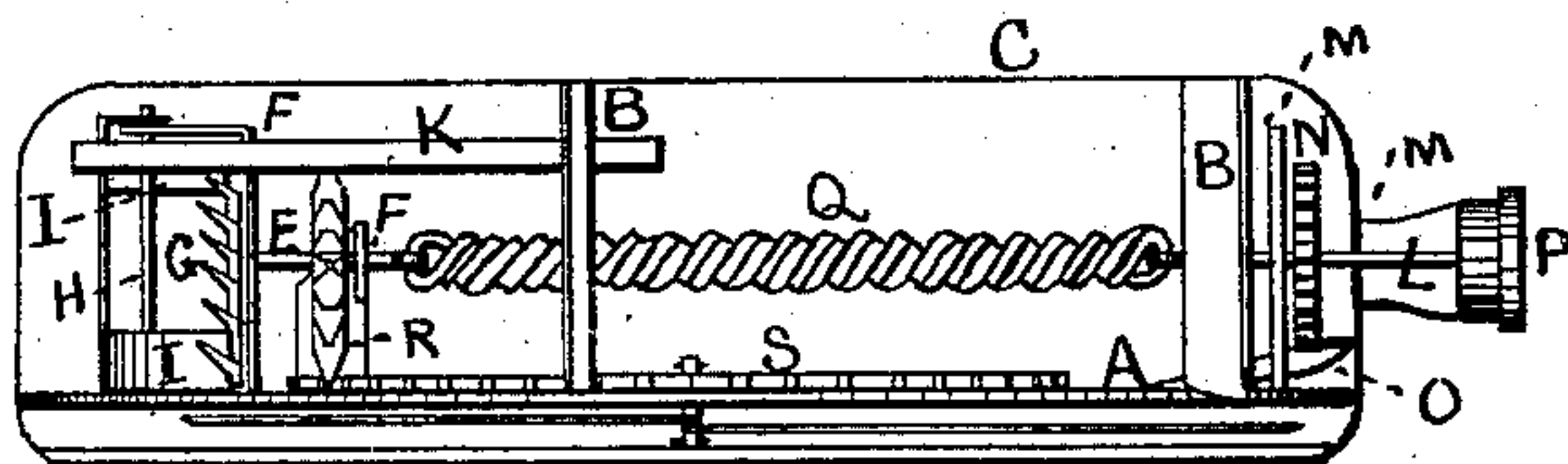


Fig. 3.

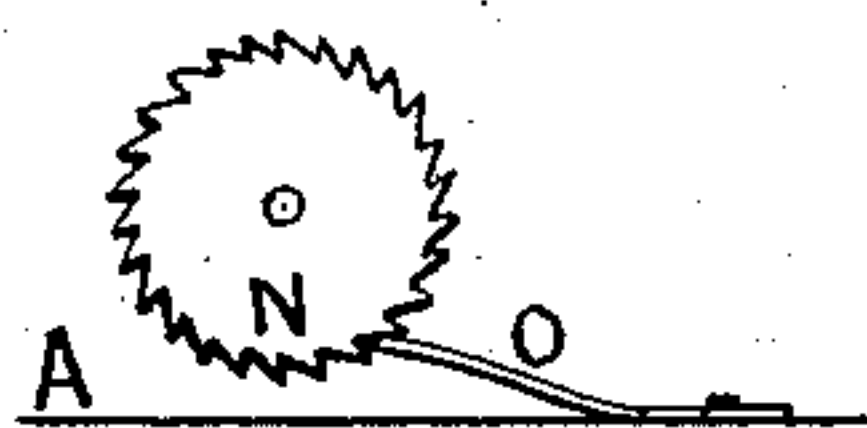


Fig. 4.

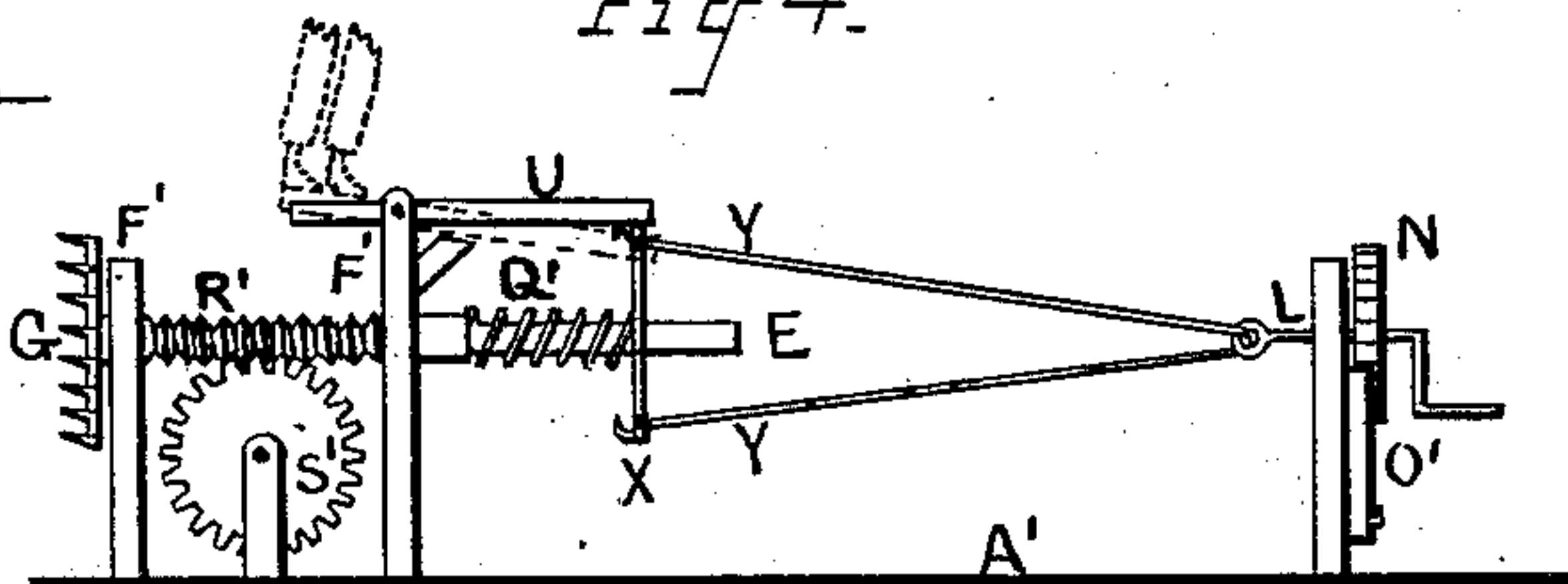


Fig. 5.



WITNESSES

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## MECHANICAL MOVEMENT FOR TOYS.

SPECIFICATION forming part of Letters Patent No. 248,205, dated October 11, 1881.

Application filed February 7, 1881. (No model.)

*To all whom it may concern :*

Be it known that I, GUSTAV OTTO, a resident of Jersey City, county of Hudson, and State of New Jersey, have invented certain  
5 new and useful Improvements in Mechanical Movements for Toys; and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a  
10 part of this specification.

My invention relates to the production of a cheap and simple mechanical movement to produce a rotation of the hands of toy watches,  
15 the wheels of toy vehicles, &c.

It consists in the combination of an arbor or rotating shaft actuated by a torsional spring and governed by a vertical escapement with a spur-wheel, worm-wheel, or other equivalent  
20 form of master-wheel, carried by the arbor and actuating the hands of a toy watch, the driving-wheels of a toy engine, or other small mechanism.

In the accompanying drawings, Figure 1 is  
25 a plan view of my invention with a rubber spring, as applied to a toy watch, Fig. 2 being a side elevation thereof, with the case in central vertical section. Fig. 3 is a detached view of the ratchet-wheel and pawl controlling the  
30 spring; and Fig. 4, a side elevation of a modification of the invention, in which a worm and worm-wheel are employed in place of simple spur-wheels to utilize the power of the spring as a motor, and with a spiral spring of metal  
35 substituted as an equivalent for a rubber spring. Fig. 5 illustrates a device for applying the torsional spring in actuating a dancing figure.

A is the bed-plate of a toy watch, and B B standards, cut out and bent up therefrom to support the case C of the watch. (See Fig. 2.)

E is the main arbor or driving shaft, revolving parallel to the bed-plate A in suitable standards, F F, at one side of the center of said plate. Upon the outer end of this arbor E, and at right  
45 angles thereto, is secured a crown ratchet-wheel, G, which is engaged by the pallets I I upon the verge H of a balance, K.

L is a winding-rod made to rotate in line with the arbor E, and parallel to the bed-plate  
50 A in supporting-standards M M, fixed at the opposite edge of said bed-plate. This rod is fitted with a ratchet-wheel, N, Figs. 1, 2, 3, en-

gaged by a click, O, Figs. 1 and 2, secured upon the bed-plate. Its outer end projects through the stem of the case and terminates in a fluted  
55 knob, P, by means of which it is rotated. The inner ends of both the arbors E and L terminate in hooks which engage a rubber band or strip, Q, stretched between them.

Upon the arbor E of the escape-wheel G is  
60 secured a pinion, R, which engages a large toothed wheel, S, rotating flat upon the bed-plate A. To the center of this flat wheel S is secured a small pin, which, projecting through the bed-plate, carries the hands of the watch.  
65 (See Fig. 2 and dotted lines Fig. 1.) The watch is inclosed within a suitable case, C, and the hands revolve over a suitable face formed upon the outer side of the bed-plate, and covered by a glass, in imitation of a time-piece.  
70

In the operation of this device the rubber  
spring Q is twisted rapidly by turning the winding-knob P, a reverse movement being prevented by the click O and ratchet-wheel N.  
75 (See Fig. 3.) So soon as the rubber is twisted it turns the arbor E and its pinion R, the movement of the pinion being regulated, however, by the oscillations of the balance K and vertical escapement-wheel G. The pinion R, driving  
80 the large wheel S, moves the hands of the watch, and the pallets, as they engage the crown-wheel in the vibrations of the balance, produce a loud ticking for the amusement of children.

As the spring Q may be wound up much  
85 more rapidly than the escapement allows it to unwind, the watch may be wound up to run for quite an interval of time thereafter.

While the principal wheel, S, is made to rotate parallel to the bed-plate A and to the axis  
90 of the main arbor E to operate the hands of a watch, it often becomes necessary, and is usually more convenient in applying and adapting this main wheel to the propulsion of a vehicle, to place its axis at right angles to the axis of the arbor E, as shown in Fig. 4, in which case a  
95 worm, R', Fig. 4, is substituted as an equivalent for the pinion R, Fig. 2, the worm engaging the cogs of the principal wheel, S', as shown in the drawings.

The wheel S' may be secured directly to the  
100 driving axle of the wheels of a toy locomotive or other vehicle.

I contemplate using as an equivalent for a rubber strip, Q, a coiled metallic spring, Q',



Fig. 4. The coiled spring Q' is slipped over the projecting end of the main arbor E, outside of its bearing, and its inner end is made fast to the arbor. A centrally-perforated bar, X, is then slipped upon the end of the arbor, outside of the spring, and left free to turn thereon, and the outer end of the spring is secured to the center of this revolving rod. Cords Y Y are led from the end of each arm of the bar X to the end of the winding-rod L, which is provided, as above described, with a ratchet-wheel, N, and click O'. Upon turning the rod L, by means of a knob or of a crank on the end of it, the cords Y Y are twisted, and operate thereby to not only twist the spring Q', but also to extend it. The spring is thus brought to bear with greatest possible power and effect in producing a rotation of the arbor or driving-shaft E, and to actuate the mechanism connected thereto by means of the intervening worm and worm-wheel S', combined with said arbor, the movement of the wheel being controlled, as required, by means of a vertical escapement, as above described.

The arms of the bar X may, in their rotation, be made to jar or vibrate a pivoted lever, U, (see Fig. 4,) to actuate a dancing toy, as indicated in the drawings, Figs. 4 and 5, and I contemplate making said device the subject of a separate application for Letters Patent.

The rotating bar X may be used equally well for producing a twisting or torsion of the rubber spring Q as of the coiled spring Q', the two ends of the rubber strip being attached to the ends of the rod in like manner, as shown

at Y Y, Fig. 4; or, if preferred, the bar carrying the ends of the rubberstrip may be secured to the end of the winding-rod L, and the rubber carried from each and brought together at the end of the arbor E.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an arbor, E, actuated by a torsional spring disposed in line therewith and governed by a vertical escapement, of a detached master-wheel, S S', geared to said arbor, substantially in the manner and for the purpose herein set forth.

2. The combination, with an arbor, E, governed by a vertical escapement, of a bar, X, carrying and separating the ends Y Y of an elastically-yielding cord secured to and twisted by a winding rod, L, substantially in the manner and for the purpose herein set forth.

3. The combination of an arbor, E, governed by a vertical escapement, a winding-rod, L, in line with said arbor, a bar, X, rotating loosely upon the arbor, and cords connecting the ends of the bar with the end of the winding-rod, of a torsional spring connected at one end to the arbor E and at the other to the rotating bar X, substantially as and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAV OTTO.

Witnesses:

J. F. ACKER, Jr.,

IRVING DICKINSON.