

H. T. KINGSBURY.
 SPRING MOTOR FOR TOYS.
 APPLICATION FILED OCT. 29, 1904.

2 SHEETS—SHEET 2.

Fig. 2.

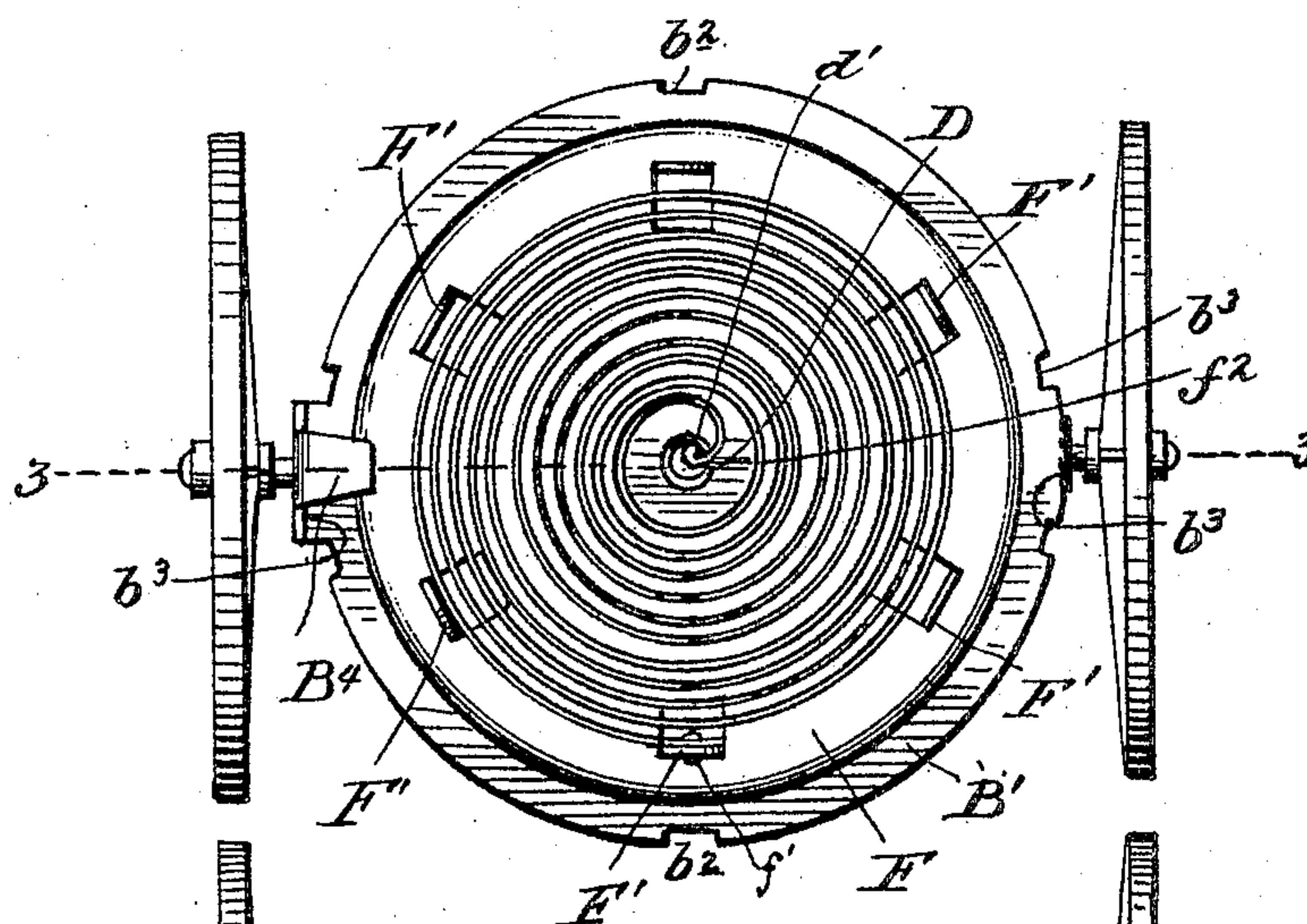


Fig. 3.

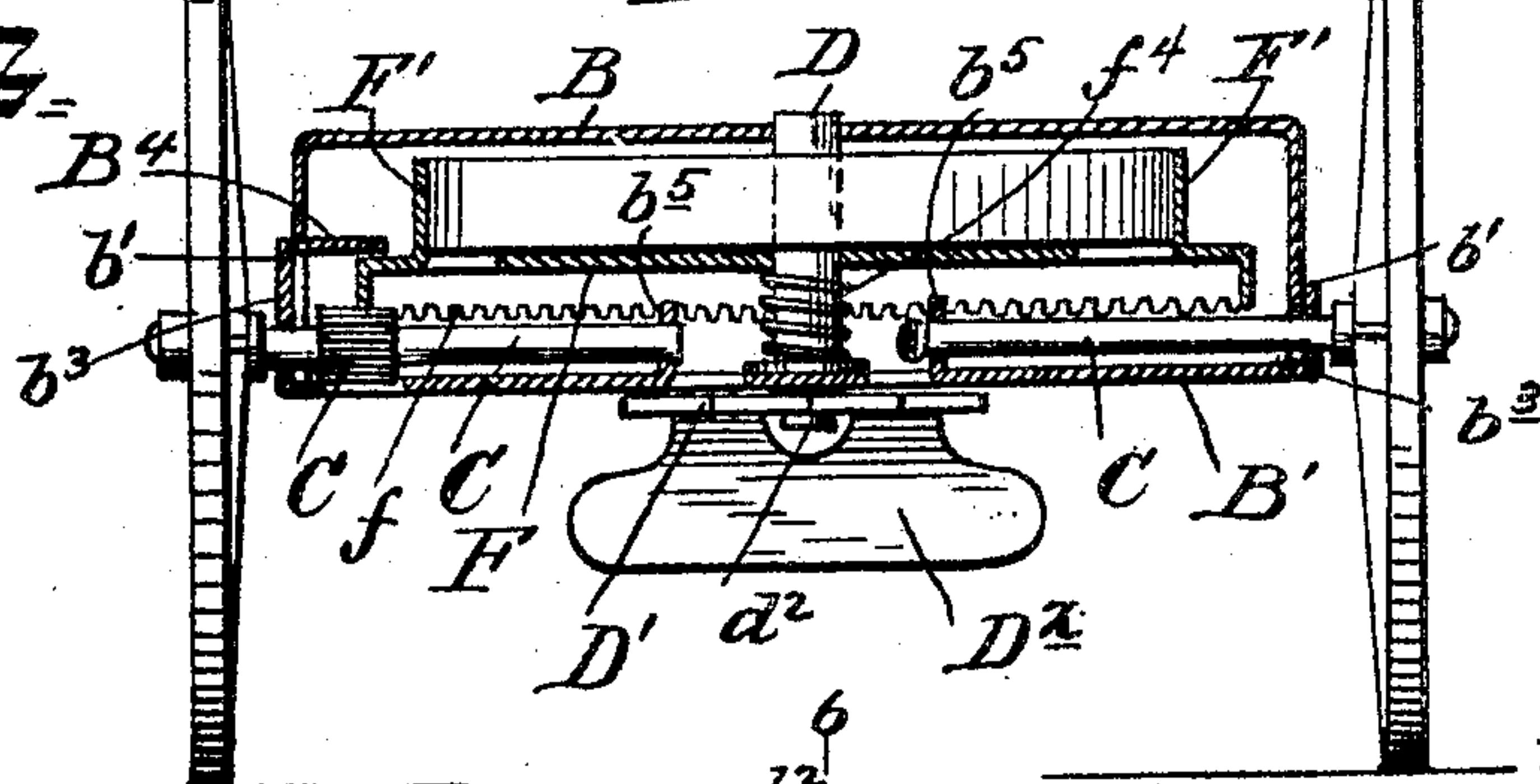
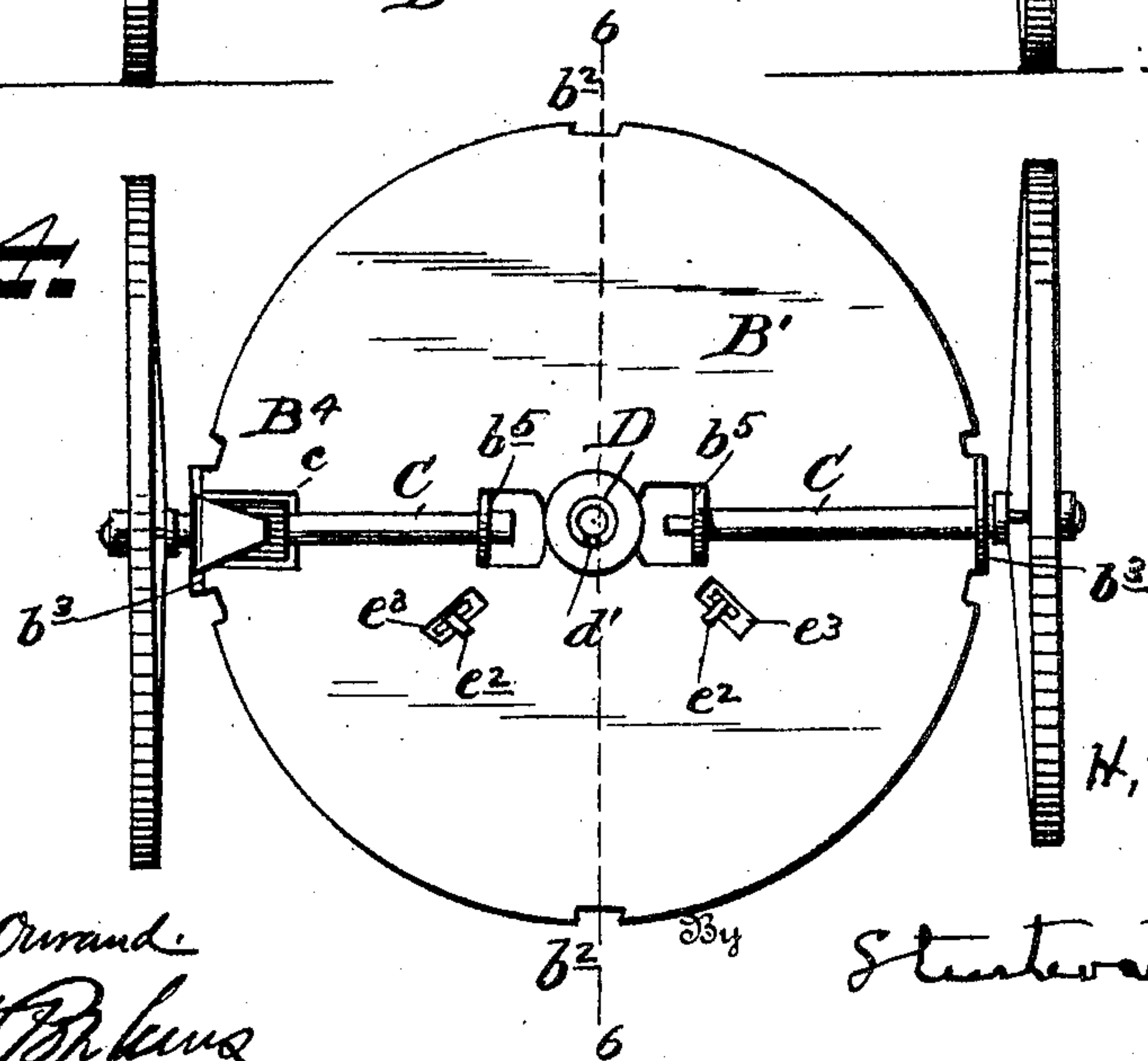


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRY T. KINGSBURY, OF KEENE, NEW HAMPSHIRE.

SPRING-MOTOR FOR TOYS.

No. 798,041.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed October 29, 1904. Serial No. 230,520.

To all whom it may concern:

Be it known that I, HARRY T. KINGSBURY, a citizen of the United States, residing at Keene, in the county of Cheshire, State of New Hampshire, have invented certain new and useful Improvements in Spring-Motors for Toys, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to spring-motors for toys.

The object of my invention is to improve the motor for which Letters Patent No. 711,323 were granted me on October 14, 1902. This I accomplish by the construction shown in the accompanying drawings, in which—

Figure 1 is a rear perspective of a toy vehicle to which my improved spring-motor is applied. Fig. 2 is a plan of the motor and drive-wheels removed from the vehicle. Fig. 3 is a cross-section on line 3 3 of Fig. 2. Fig. 4 is a plan of the bottom plate and the axles and drive-wheels. Fig. 5 is an inverted plan of the same. Fig. 6 is a detail perspective of the pawl. Fig. 7 is a detail vertical sectional view of the ratchet, its handle, and the winding-shaft on line 6 6, Fig. 4; and Fig. 8 is a similar view on line 7 7, Fig. 4.

A designates a toy vehicle of any desired type, at the rear of which are parts A' A', representing the rear springs, and to the lower sides of these parts A' is secured the upper side of the motor-casing B. The casing B is preferably formed as an inverted open circular box having depending lugs b b around its lower edge and notches b' b' in its opposite sides. B' is the bottom plate of the casing, formed with peripheral notches b^2 b^2 to receive the lugs b b , which are upset or bent over upon the under side of the bottom to hold it in place. The bottom is further provided with upwardly-projecting apertured ears b^3 b^3 at its opposite sides for the divided axle C C, to which in the present instance the rear wheels of the vehicle are attached. The inner ends of the divided axle are mounted in ears b^5 b^5 , punched up from the bottom plate near its center. These parts are constructed like the corresponding parts in the patent above referred to and need not be further described.

D represents the vertical winding-shaft, formed of a short length of tubing having a longitudinal slot d' and provided at its lower end with two lugs d^2 d^2 , passed through two apertures d^3 in a ratchet-wheel D' and then

upset to secure the shaft and ratchet together. The ratchet-wheel D' has two other apertures d^4 d^4 , which receive the lugs d^5 d^5 , projecting from the handle or thumb-piece D², said lugs being also upset to secure the handle in place. The handle D², ratchet D', and winding-shaft D are thus rigidly connected and may be cheaply made from sheet metal and readily assembled. I consider this one improvement over the patented construction referred to, a further improvement being in the construction and arrangement of the escapement-pawl E, which is provided at its middle with a pivot-lug e , extending up through an aperture e' in the bottom plate B' and then bent over to prevent displacement. The ends of the pawl are bent up to form the teeth e^2 , which engage the ratchet-teeth, and these teeth pass up through slots e^3 in the bottom plate B' and are then bent over, so as to prevent accidental displacement. The pawl E is thus connected at three points with the bottom plate B', so that there is no chance of its becoming detached, as is the case where a single rivet or screw forms the connection.

F designates the horizontal driving-gear formed with depending teeth f and centrally apertured for the passage of the winding-shaft, as in my prior construction; but in the present construction instead of attaching a circular band or flange to the upper side of the gear I punch up therefrom a circularly-arranged series of lugs or ears F', within which lies the convolute mainspring S, the outer end of the spring being attached in any suitable manner, as by a rivet f' , to one of the lugs F', while the inner end of the spring is passed into the slot of the winding-shaft D, within which shaft the spring is provided with a bend f^2 to prevent its withdrawal. This simplifies and cheapens the construction of these parts and permits of a ready assembling.

One of the axle members C has a pinion c , meshing with the gear-teeth f and held from disengagement therefrom by an arm B⁴, formed as a continuation of the adjacent ear and extending over the gear-wheel F directly above the pinion c , and so preventing the said gear-wheel from rising out of engagement with said pinion, as frequently happens in this class of motors.

The gear-wheel F is spaced from the bottom plate B' by means of a short length of spiral spring f^4 , which I find to be preferable to a sleeve. This spiral spring f^4 is merely a

washer to properly space the gear-wheel F from the plate B', and it allows of the proper engagement of the gear F with the pinion, as it will yield and not require the exactness of size that a sleeve would.

In assembling the parts the pawl, the ratchet-wheel, and shaft are secured to the bottom plate, as are the axles C C, after which the gear-wheel F, with its spring in place, is passed down on the drive-shaft, the inner end of the spring entering the slot in said shaft. The arm B¹ is then bent over the gear F, whereupon the motor is inserted into its case and secured by upsetting the lugs b b.

The motor may be secured in place to the toy to be driven in any desired manner, and the term "bottom plate" is used merely as a convenient term, since the case could be inverted, and then the plate B' would be the top plate.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spring-motor, the combination with the spring and its transmitting-gear, of a tubular slotted shaft receiving the inner end of the spring and having lugs or ears depending from its lower end, a ratchet-wheel having apertures through which said lugs project from the upper side and are upset; said ratchet also having two other apertures, a key having two lugs projecting up through said last two apertures and upset, and an escapement-pawl engaging said ratchet; substantially as set forth.

2. In a spring-motor, the combination with the spring and its winding-shaft, of a plate through which the shaft extends and a ratchet on the shaft, said plate having an aperture and two slots at opposite sides of the aperture, and a pawl having a pivot-forming projection at its middle projecting through said pivot-aperture, and end projections projecting through said slots and forming teeth engaging the ratchet-teeth, the ends of the said three projections being bent over upon the plate to retain the pawl in place; substantially as described.

3. The combination in a spring-motor, with a plate, and an axle carried thereby and having a pinion, of a horizontal drive-gear meshing with the pinion, a spring connected at one end to the drive-gear, a winding-shaft extending through the drive-gear and connected to the inner end of the spring, a loose washer-forming spiral spring on the winding-shaft between the plate and the drive-gear, and means for actuating the winding-shaft; substantially as described.

4. A spring-motor comprising, a casing having lugs on its edge, a plate having marginal recesses or openings in which said lugs fit and are upset a pivot-aperture and slots at opposite sides thereof, an axle mounted on the plate, drive-wheels on the axle, a pinion on the axle, winding-shaft extending up through the plate, a horizontal gear turning loosely on the inner end of the winding-shaft, meshing with said pinion and having a circularly-arranged series of struck-up arms or lugs on its upper side, a convolute spring within said lugs, secured at its outer end to one lug and at its inner end secured to the winding-shaft, a ratchet on the lower end of the shaft and provided with a handle, an escapement-pawl having a central pivot-lug projecting through the said pivot-aperture in said plate, and end teeth-forming lugs engaging the ratchet and projecting through the slots formed in said plate, the three pawl-lugs being bent over at their inner ends to retain the pawl in position; substantially as described.

5. In a spring-motor, an escapement-pawl provided at its middle with a pivot-lug and at its ends with tooth-forming lugs, said three lugs or ears having extensions adapted to be bent over and form three retaining-points; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY T. KINGSBURY.

Witnesses:

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CHARLES C. STURTEVANT.