No. 836,734. PATENTED NOV. 27, 1906.

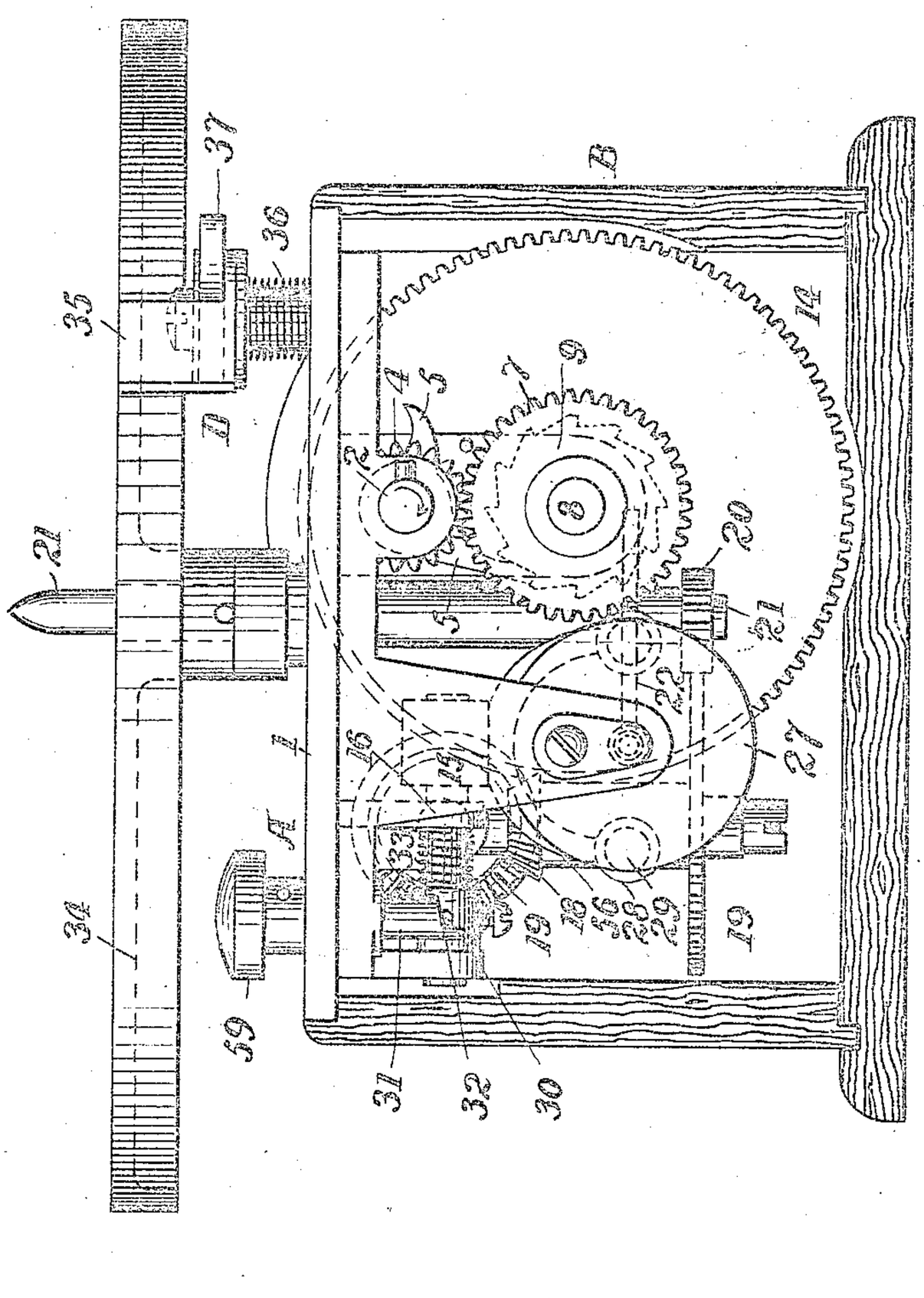
J. BORNAND.

SPRING MOTOR.

APPLICATION FILED NOV. 29, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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3 SHEETS—SHEET 2.

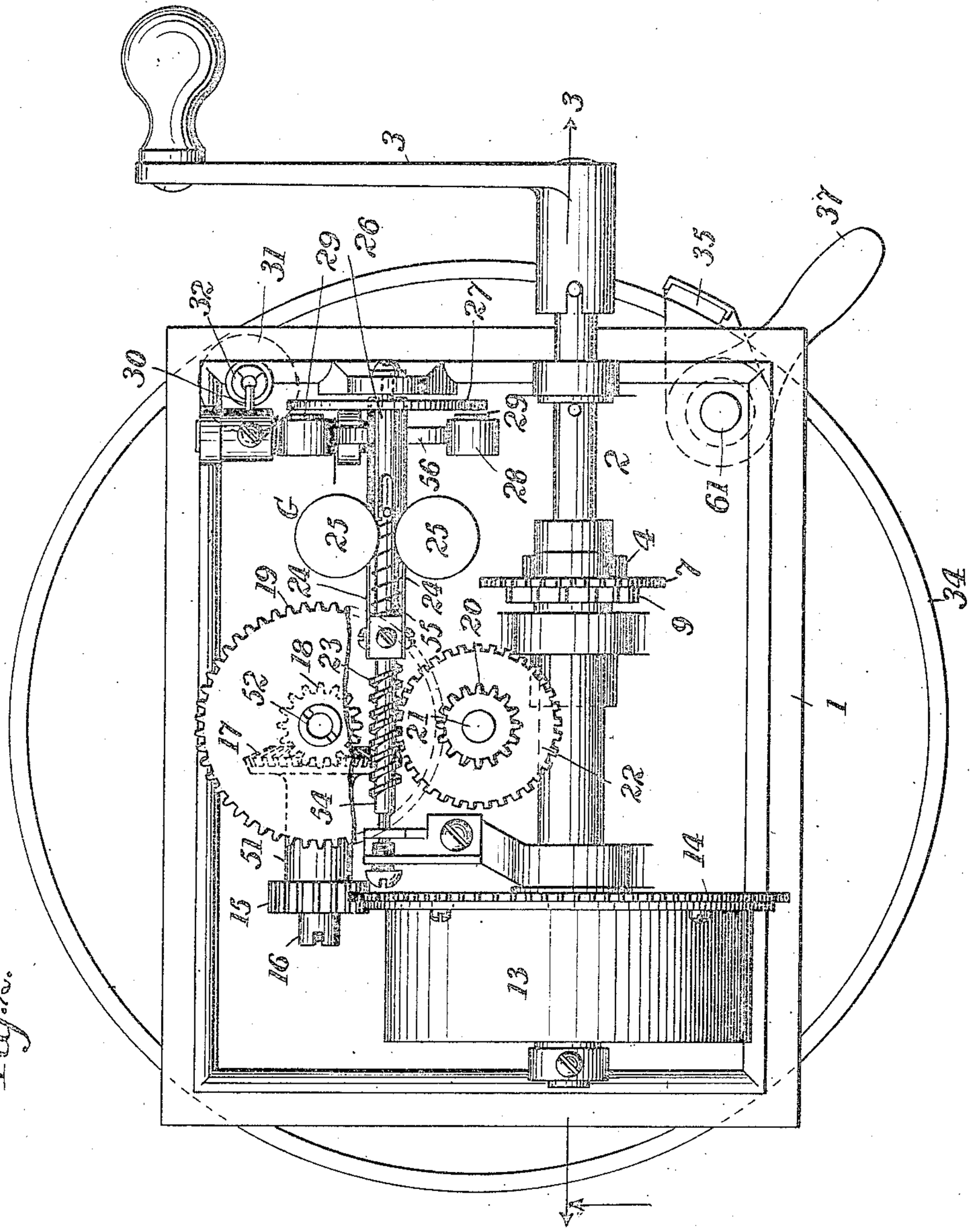

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

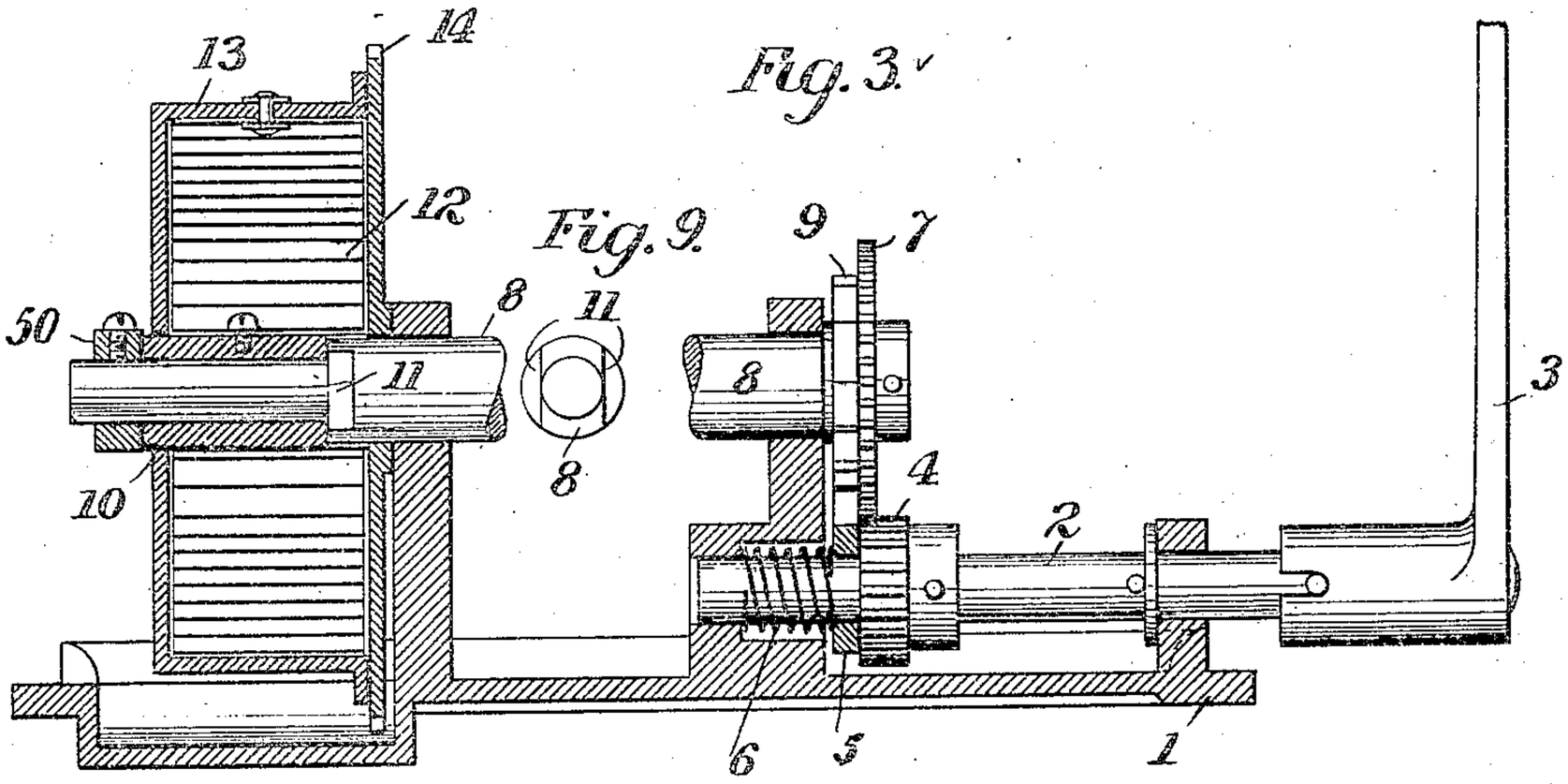

Fig. 9.

Fig. 4.

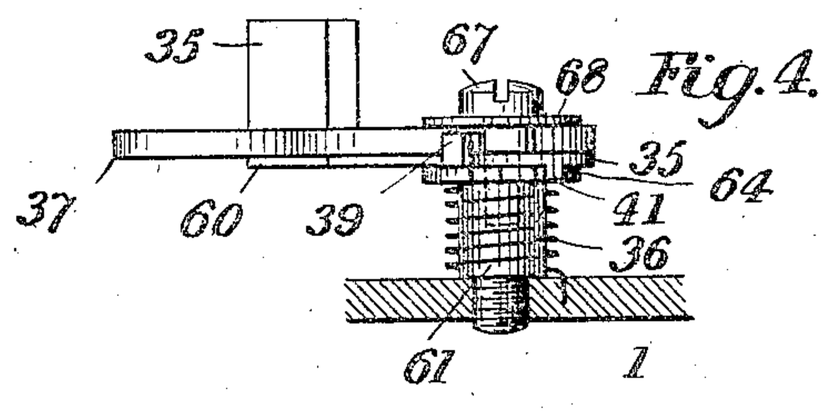

Fig. 5.

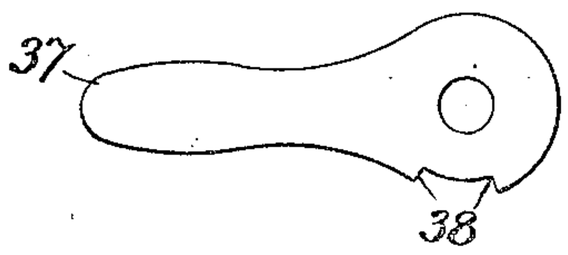

Fig. 8.

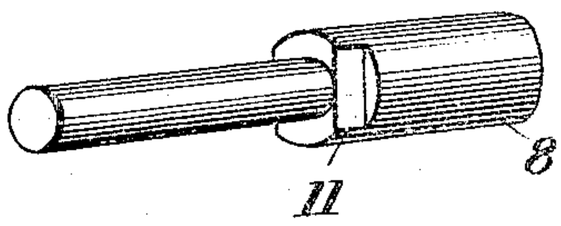

Fig. 6.

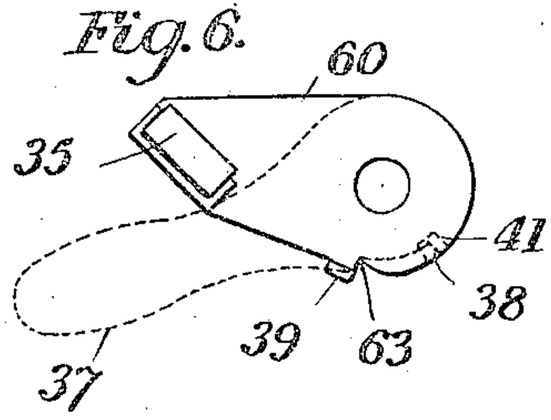

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOSEPH BORNAND, OF NEW YORK, N. Y.

SPRING-MOTOR.

No. 836,734. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed November 29, 1905. Serial No. 289,625.

To all whom it may concern:

Be it known that I, JOSEPH BORNAND, a citizen of the Republic of Switzerland, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Spring-Motors, of which the following is a specification.

My invention relates to spring-motors; and it consists in certain details of construction of such motors, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a spring-motor embodying my improvements. Fig. 2 is an inverted plan view, the casing removed. Fig. 3 is an inverted view in partial section on the line 3 3, Fig. 2. Fig. 4 is a side view of the brake device. Figs. 5, 6, and 7 are plan views of parts of the brake device detached. Fig. 8 is a perspective view showing the end of the shaft that supports the spring-barrel. Fig. 9 is an end view of the winding-shaft.

The frame A of the machine consists of a top platform 1 with pendent brackets beneath supporting the operating parts, the said platform fitting the top of a casing B, which incloses the parts beneath the platform. The said brackets have bearings for the winding-shaft 2, which extends through the side of the casing and is provided with a pin adapted to a notch of a separable handle 3, by which the shaft may be turned, turning therewith a pinion 4, which meshes with a gear 7 upon a second shaft 8, upon which is supported a drum or barrel 13, containing a spring 12, secured at one end to the barrel and at the other to the shaft 8. Preferably the inner end of the spring is secured to the shaft 8 through the medium of a sleeve 10, fitting the contracted end of the shaft 8 and operating upon flattened faces 11 11 thereof and held in place by a detachable collar 50. This facilitates the construction and the removal of the parts from the shaft 8, as by detaching the collar 50 the barrel and the sleeve 10 can be withdrawn from the shaft 8 and as readily replaced and again secured by means of the collar.

The power of the spring is transmitted to a vertically-driven shaft 21 through suitable gearing. As shown, the said gearing consists of a gear 14, connected with the barrel 13 and meshing with a pinion 15, carried by a sleeve 51, turning upon a stud 16 and provided with a bevel-gear 17, that engages a bevel-pinion 18 upon a vertical stud 52. The bevel-gear 18 is connected with a spur-gear 19, which engages a pinion 20 on the driven shaft 21.

The rotation of the shaft 2 by means of the handle 3 is the means of turning the shaft 8 and winding up the spring, and to prevent the reverse action of the shaft 8 the latter is provided with a ratchet-wheel 9, which engages the L-shaped pawl 5, hung to the shaft 2, and is pressed against a bearing on the latter—as, for instance, the pinion 4—by a spring 6.

The friction between the pawl and the bearing on the shaft 2 insures that the pawl shall be carried from the ratchet when the shaft is turned in the direction of its arrow, Fig. 1, to wind up the spring, and this winding therefore is effected without the noise which usually results from the slipping of a pawl on the ratchet-teeth. When the spring reacts and tends to turn the shaft 2 in the opposite direction, the friction against the pawl insures that it shall be swung in a position to engage the teeth of the ratchet.

The apparatus is provided with a governor G of suitable character. As shown, a gear 22 upon the shaft 21 engages a worm 23 upon a shaft 54, turning in suitable bearings and carrying a sliding sleeve 26, which is forced outward by a spring 55, and to which are connected two spring-blades 24 24, each bolted to a block upon the shaft 54 and each connected at the outer end to the sleeve 26. At the outer end of the sleeve 26 is a disk 27, and upon each spring-blade 24 is supported a weight 25, so that as the rotation of the shaft causes the weight to fly outward the disk 27 is brought frictionally against any suitable frictional bearing to thereby create a resistance to the too rapid movement of the parts driven from the spring. While any suitable coacting bearing may be employed in connection with the disk 27, I prefer to make use of a fork 56, carrying two blocks 28 28 at its ends, each with a pad 29 in position to receive the thrust of the disk 27, and this fork may be shifted so as to act as a friction-stop. As shown, the fork is carried by a rock-shaft 30, around which is coiled a spring 33, that tends to carry the fork toward the disk. From this rock-shaft extends an arm 32 below the lower cam end of a vertical shaft 31, turning in the platform 1 and provided with a knob 59, upon turning which the shaft 30 is rocked to carry the fork away from the disk

to an extent to permit the rotation of the latter, undue speed being prevented by the action of the governor in carrying the disk away from the friction-bearings, and by adjusting the knob 59 the speed may be regulated. On turning the knob in the opposite direction the spring carries the fork against the disk with such force as to totally arrest the rotation.

The shaft 21 may be the means of communicating movement to any desired object, but, as shown, it is adapted to a socket in the hub of a disk 34, adapted to receive the disks of a graphophone.

In order to act upon the disk 34 to start and stop the machine, I make use of a brake D, having a shoe 35, adapted to act upon the periphery of the disk. As shown, the shoe 35 is upon an arm 60, swinging freely upon a stud 61, projecting upward from the platform 1, and below the arm 60 is a plate 64, having two separated shoulders 42, and above the arm 60 is an arm 37, having two shoulders 38 separated, but to a less extent than the shoulders 42. Upon the arm 60 are two studs 39 41, projecting, respectively, upward and downward with an intermediate cam-surface 63, and a spring 36 is coiled around the stud 61 and is secured at one end to the platform, and the other projects upward across the cam-face 63 and bears on one side of the stud 39. The stud 41 extends downward between the shoulders 42 of the disk 64, and the spring tends to swing the arm 60 so as to carry the shoe 35 against the edge of the disk 34. A screw-bolt 67 presses a washer 68 upon the arm 37, creating such friction that said arm will remain in any position to which it is set. When in its inner position, the arm 60 can swing independently of the arm 37 under the pressure of the spring to the extent to which the stud 39 can play between the shoulders 38, but when the arm 37 is swung outward the outer shoulder 38 contacts with the stud 39 and swings the arm 60 to carry the shoe 35 away from the edge of the disk, and the arm 60 is held in this position by the friction of the washer 68.

Without limiting myself to the constructions shown, I claim—

1. The combination in a spring-motor of the barrel-shaft having shoulders, a sleeve detachable longitudinally from said shaft and with shoulders at the inner end engaging those of the shaft, a drum rotatable on the shaft, and a coiled spring connected with the drum and with the sleeve.

2. The combination with the barrel and spring of a motor, of a shaft extending through said barrel and provided with a reduced end and with flat faces 11, 11, on the larger part adjacent to said reduced portion, a sleeve on said shaft and bearing on said faces, means for connecting the spring to the barrel and to the sleeve, and means for holding the sleeve longitudinally on the shaft, substantially as set forth.

3. The combination with the winding-shaft and barrel-shaft of a spring-motor, of intermeshing gears, a pawl swinging on the winding-shaft, means for holding it frictionally against the gear thereof, and a ratchet on the barrel-shaft engaged by the pawl, substantially as set forth.

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

JOSEPH BORNAND.

Witnesses:

E. C. EVANS,

ALFRED LUCAS.