No. 669,131. Patented Mar. 5, 1901.

C. VOGT.

SPRING MOTOR.

(Application filed May 5, 1898.)

(No Model.)

Fig. 1.

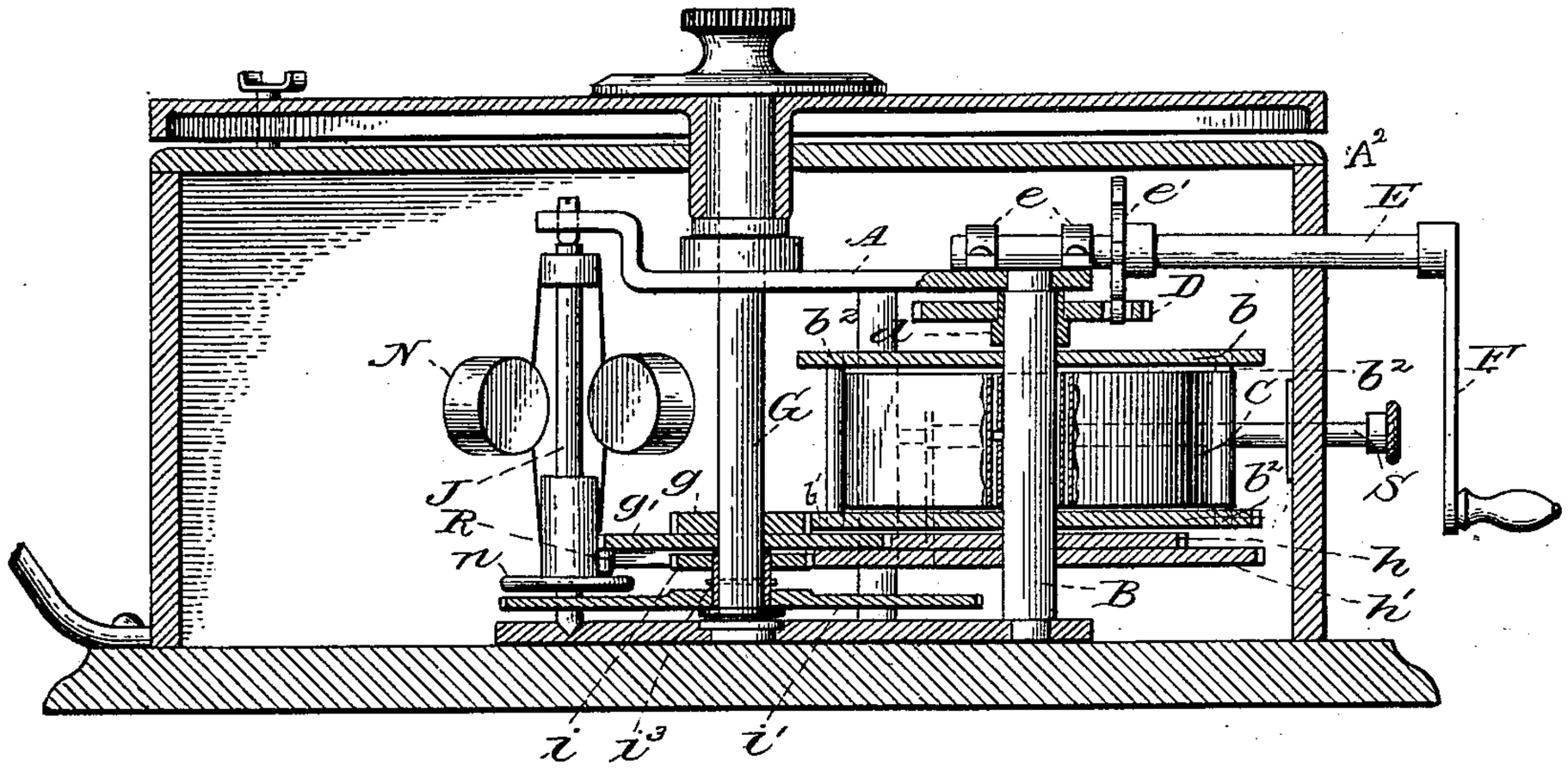


Fig. 2.

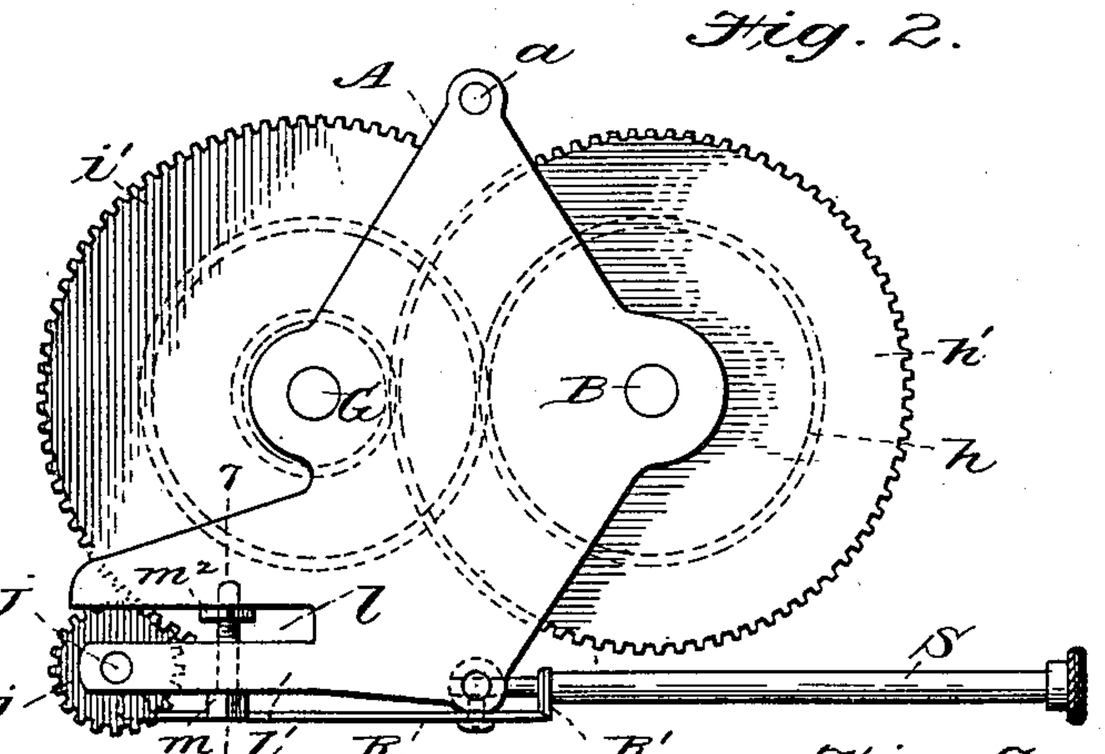


Fig. 3.

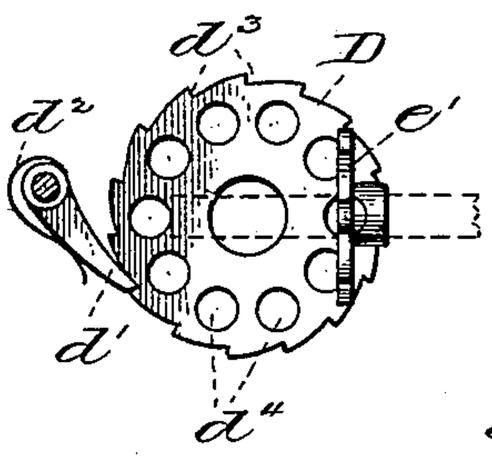


Fig. 4.

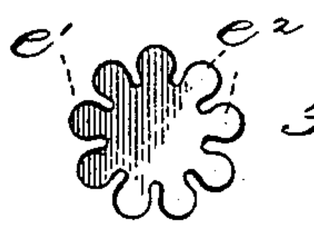


Fig. 5.

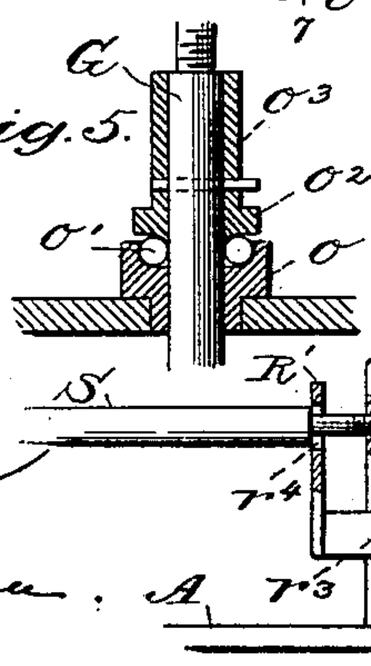


Fig. 6.

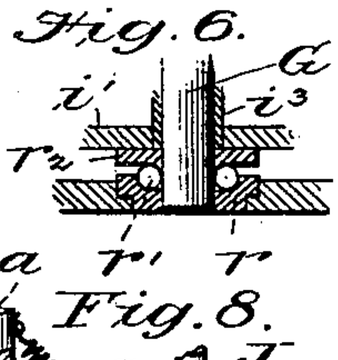


Fig. 7.

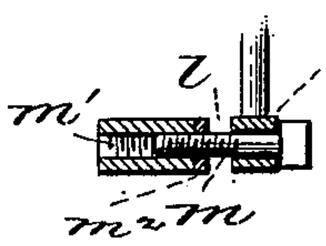
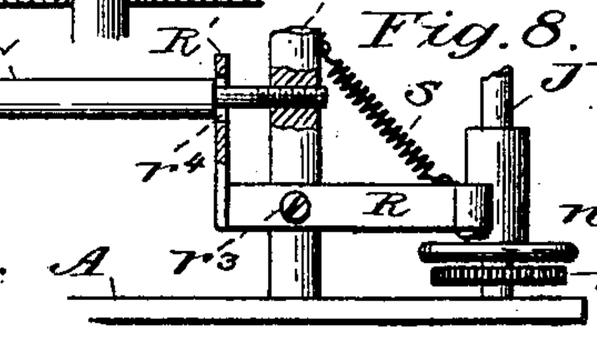


Fig. 8.



Witnesses.
J. S. Cross.
J. Henderson.

Inventor
Clarence Vogt,
By J. Holmes Pettit
Attorney.

UNITED STATES PATENT OFFICE.

CLARENCE VOGT, OF WENONAH, NEW JERSEY, ASSIGNOR TO ELDRIDGE R. JOHNSON, OF PHILADELPHIA, PENNSYLVANIA.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 669,131, dated March 5, 1901.

Application filed May 5, 1898. Serial No. 679,804. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE VOGT, a citizen of the United States, and a resident of Wenonah, New Jersey, have invented certain new and useful Improvements in Spring-Motors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to spring-propelled motors; and it has for its object to generally improve the construction of this class of devices and also to provide a small compact motor of sufficient strength and power to run small machines, and particularly gramophones and other sound recording and reproducing machines.

The invention consists in the combination and arrangement of parts such as will be hereinafter described more fully, and particularly pointed out in the claims.

Referring to the drawings, in which similar letters of reference are used to indicate like parts, Figure 1 is a sectional elevation of a motor embodying my invention, showing it in connection with a turn-table and casing such as is ordinarily used on gramophones. Fig. 2 is a bottom plan view of my improved motor removed from its outer casing. Fig. 3 is a detail view of my combined gear-and-ratchet machanism for winding the spring. Fig. 4 is a detail of the gear on the crank-shaft. Fig. 5 is a detail section of the ball-bearings for the upper end of the turn-table spindle. Fig. 6 is a similar view of the ball-bearings for the lower end of the turn-table spindle. Fig. 7 is a sectional detail taken about on the line 7 7 of Fig. 2, and Fig. 8 is a detail of the governor-brake mechanism.

In the said drawings, A designates the motor-casing, consisting of an upper and lower plate made of metal or other suitable material and secured together by suitable uprights or posts *a*.

B designates the winding stud or shaft, which is suitably journaled in the casing A at one end thereof. On the shaft B are loosely mounted an upper disk *b* and a lower disk *b'*, suitably connected by means of the tie-bolts b^2, and thus forming a cage for the reception of the spring C. The lower disk *b'* is provided on its periphery with gear-teeth, the function of which will be hereinafter described.

The spring C, which is a coil of the usual construction, is secured at its inner end to the shaft B, while its outer end is secured to one of the tie-bolts b^2 of the cage. On the shaft B, directly below the upper casing A, is rigidly mounted a combined gear-and-ratchet wheel D, which is preferably driven on a bushing *d*, keyed or pinned to the said shaft B, as illustrated, but might be secured in any other well-known manner. On the under side of the upper casing is pivoted a pawl *d'*, provided with a spring d^2, adapted to keep it in engagement with the ratchet-teeth of the wheel D, the object of which is to prevent the return movement of the shaft B under the impulse of the spring C when the same is wound up.

The wheel D, as heretofore stated, is a combined ratchet and gear and is constructed with the ratchet-teeth d^3 on its periphery and a series of openings d^4 on its surface equidistant apart and on a circumferential line. This wheel may be stamped or punched with an ordinary die and can be very easily and cheaply made, much more so than the usual bevel-gear, which has to be cut very accurately.

Located centrally above the shaft B and running at right angles thereto is a shaft E, secured to the upper casing in suitable bearings *e* and extending out beyond the outer frame A^2 for the reception of an operating crank and handle F. On the inner end of the shaft E is secured a gear-wheel *e'* of peculiar construction and most clearly illustrated in Fig. 4 of the drawings. This gear is formed with coarse rounded teeth e^2, which can also be stamped or punched out with an ordinary die and are adapted to engage with the openings d^4 in the gear D for transmitting motion to the winding-shaft B.

The disk *b'* has formed on its periphery suitable gear-teeth adapted to mesh with a pin-

ion g, rigidly connected to a gear g', loosely mounted on the turn-table spindle G. On the shaft B, directly below the disk b', is a gear h, rigidly secured to a gear h', loosely mounted on the said shaft B, the said gear h adapted to mesh with the gear g' on the turn-table spindle and the said gear h' with a gear i, rigidly secured on the spindle G. A large gear i', located directly below the gear i, is also rigidly secured to the shaft G. These two gears i i' are preferably driven on a bushing i^3, which may be pinned on the shaft G, as illustrated in the drawings. The gear i' meshes with a pinion j, rigidly mounted on the lower end of a governor-spindle J, for transmitting motion thereto. For the purpose of providing an adjustment for the governor-spindle at its lower end in order that its pinion may always properly mesh with the driving-gear i' I provide a split l in the lower casing A on one side of the bearing-point of said governor-spindle, forming a yielding tongue l', and in the portion i I provide an opening for the reception of a screw m, adapted to fit loosely in said opening and engage a screw-threaded opening m' in the casing A on the opposite side of the split l. Thus by tightening up the bolt m the governor-spindle J and its pinion may be readily adjusted with relation to the gear i'. A lock-nut m^2 may be used on the screw m in the split portion l of the casing for insuring an adjustment in either direction.

N designates the governor, which may be of any of the well-known constructions, and I do not therefore consider it necessary to describe the same in detail. A disk n is rigidly secured on the governor-sleeve and to which a suitable brake mechanism may be applied, as will be hereinafter described.

In operation power is transmitted to the winding-shaft B through the medium of the shaft E and its gearing, which winds up the spring C, causing its supporting-cage to revolve and impart motion through gear b' to the idle gears g g' on spindle G, the gear g' meshing with idle gear h and revolving both gears h h' on the winding-shaft B, said gear h' meshing with pinion i, which is rigid on the shaft G, thereby communicating motion to the said shaft G for running the turn-table or other mechanism that might be geared thereto and also revolving the large gear i', which is rigid on said shaft G and must consequently turn therewith, said gear i' being in mesh with the pinion j on the lower end of the governor-spindle J, and thereby imparting rapid motion to the said governor-spindle.

The turn-table spindle G, which is in reality the main driving-shaft of my motor, is provided with ball-bearings both at its upper and lower journals in order to prevent friction and generally facilitate the running of this shaft. The upper bearing, which is illustrated in detail in Fig. 5 of the drawings, consists of a cup o, provided with a boss on its lower side, which is securely fitted in an opening provided in the casing A around the shaft G, said cup o adapted to receive a series of balls O', which bear against the said shaft G. A cone o^2, provided with a sleeve o^3, is rigidly secured on shaft G and bears on the upper surfaces of the balls o'. The lower bearing (illustrated in detail in Fig. 6 of the drawings) consists of a cup r, fitted tightly in an opening provided in the lower casing A around the shaft G and adapted to receive a series of balls r'. A cone r^2, rigidly secured to gear i', bears on the upper surface of the balls r'. This cone might be formed as a part of the bushing i^3, which is rigid on the shaft G, instead of being secured to the gear i', as illustrated.

By my improved arrangement of gearing I am enabled to suitably multiply the speed of the different gears as required and produce a very compact motor, greatly economizing in space and which, together with my simple construction of gearing for the winding-shaft B, enables me to produce a very cheap and effective motor, such as may be adapted for running different classes of light machinery.

In order that the speed of the governor may be regulated, I provide a suitable brake, which consists of an arm R, pivoted to the post a of the supporting-frame, as at r^3, the rear end of which is adapted to bear against the disk n of the governor-spindle. The other end R' of the said arm R is twisted and bent at right angles in an upward direction, as illustrated in Fig. 8 of the drawings. A screw S, provided with a reduced end, passes through an elongated slot r^4 in the arm R' and into a screw-threaded opening provided in the post a. A coiled spring s is provided for holding the brake-arm normally away from the disk n. Thus it will be seen that when the screw S is operated the brake-arm can be thrown into contact with the said disk n and the degree of friction regulated by the operation of the said screw S, thereby decreasing or increasing the speed of the motor at will.

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

1. The combination of a spring-propelled cage, winding mechanism therefor, a driving-shaft, gearing connecting the spring-propelled cage and the driving-shaft, a governor-spindle, gearing connecting the same with the driving-shaft, a yielding tongue provided in the lower casing carrying the governor-spindle, a set-screw engaging the said tongue and casing whereby the relative distance between the lower bearing of the two shafts may be adjusted, substantially as described.

2. The combination in a spring-motor of a casing-plate A, having a yielding tongue, l', provided thereon, bearings for the motor mechanism provided in the main body of the plate and bearing for governor-spindle pro-

vided in said yielding tongue, a screw, *m*, adapted to fit loosely through the tongue and to engage a screw-threaded opening, *m'*, in the casing, A, to regulate the intermesh of the gear carried by said tongue and one of the gears carried by the casing, substantially as described.

In witness whereof I have hereunto set my hand this 3d day of May, A. D. 1898.

CLARENCE VOGT.

Witnesses:
HERMAN C. HORN,
J. T. CROSS.