

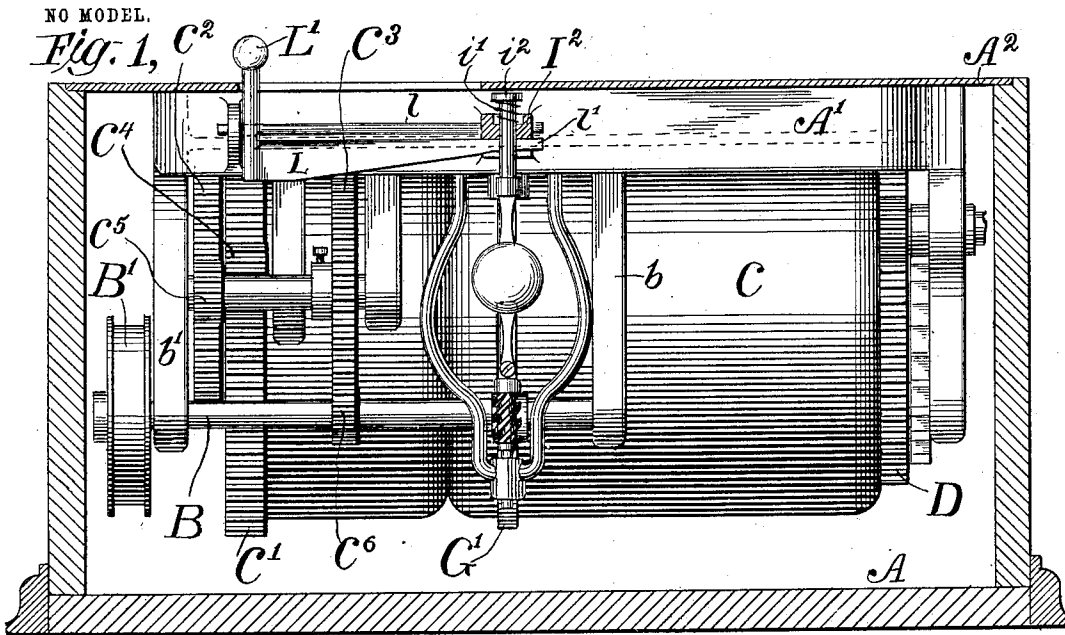
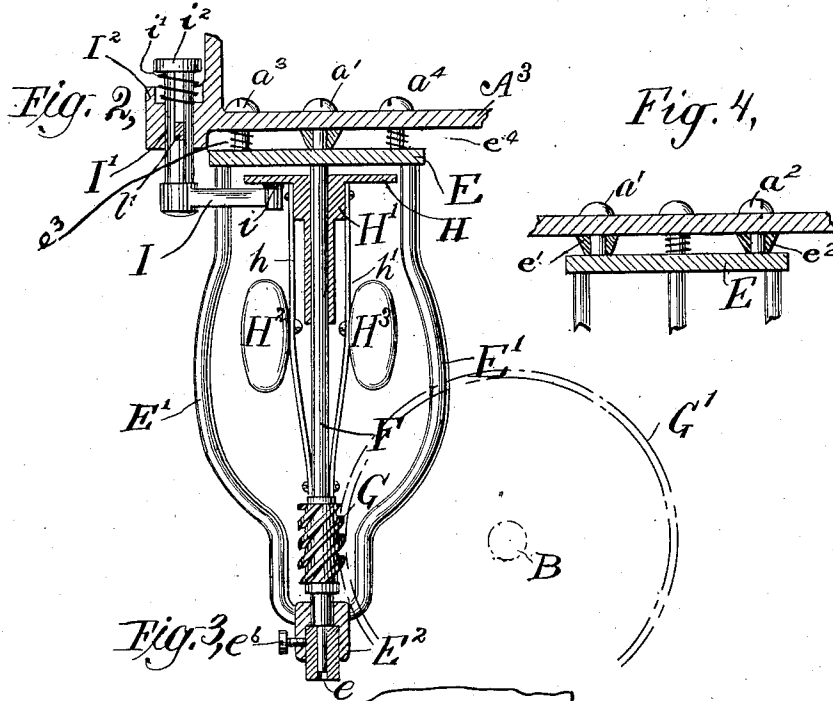
No. 728,488.

PATENTED MAY 19, 1903.

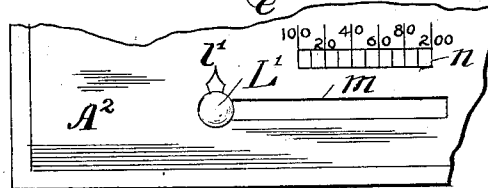
G. W. MERRILL, JR.
SPEED REGULATOR FOR SPRING MOTORS.

APPLICATION FILED FEB. 13, 1901.

NO MODEL.



WITNESSES:
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UNITED STATES PATENT OFFICE.

GEORGE W. MERRILL, JR., OF NEW YORK, N. Y., ASSIGNOR TO HAWTHORNE AND SHEBLE MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

SPEED-REGULATOR FOR SPRING-MOTORS.

SPECIFICATION forming part of Letters Patent No. 728,488, dated May 19, 1903.

Application filed February 13, 1901. Serial No. 47,102. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MERRILL, Jr., a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Speed-Regulators for Spring-Motors, of which the following is a specification.

In making a sound-record on a phonograph, graphophone, or similar machine it has been customary to rotate the phonogram-blank at a speed varying in practice from about one hundred and twenty to two hundred rotations per minute, according to the individual ideas of the manufacturer as desirable for the particular character or class of sounds being recorded. In order to secure the best results, the sound-record cylinders should be rotated at the same surface speed when the sound is being reproduced as the phonogram-blank was rotated when the record was being made.

The object of my invention is to produce a speed regulator and indicator to secure this correspondence instantly at the beginning of the reproduction of the sound, so that the user knowing the speed at which the blank was rotated in making the record may so adjust the regulator that there will result the same speed of rotation of the sound-record cylinder when the record is being reproduced.

I will describe a machine embodying my invention and then point out the novel features thereof in the claims.

In the accompanying drawings, in which similar letters of reference indicate similar parts, Figure 1 is a front view of a motor mechanism having attached my improvement. Fig. 2 is a side view of the governor and its parts. Fig. 3 is a view of the scale on top of the case, and Fig. 4 a detail view.

A designates the box or case inclosing the motor mechanism; A', the motor-frame, which, as usual, is a casting secured to the underside of the plate A² of the case.

B is the driving-shaft, fitted in bushings in the brackets b and b'. From the driving-pulley B' extends a belt to the main-shaft

pulley to drive the phonogram-blank or sound-record cylinder. The shaft B is driven in the usual manner by means of a spring or springs inclosed within the barrel C through the train of gearing comprising the wheels C', C², and C³ and the pinions C⁴, C⁵, and C⁶, as will be readily understood, the pinion C⁶ being keyed or otherwise secured to the shaft B. The spring is provided with the usual winding mechanism D.

A³ designates a portion of the motor-frame. Passing through this frame are four screws a', a², a³, and a⁴, which engage openings in a base E, which base supports four posts E', constituting the governor-frame. These posts may be bent as shown, the lower ends taking into a collar E². In this collar is held by a set-screw e⁶ a steel bushing e, and seated in this bushing is the reduced lower end of the governor-shaft F, the upper end of said shaft being seated in a similar bushing in the base E. To the shaft F is secured by suitable means a spiral pinion G, which meshes with a spiral driving-wheel G', keyed or otherwise secured on the shaft B. A sleeve H' is slidably mounted on the shaft F. Formed integral with said sleeve or separate and secured thereto by suitable means is a friction-disk H.

h and h' are springs secured, preferably, by screws at their upper ends to the sleeve H' and at their lower ends to the shaft F. Governor-balls H² and H³ are secured by screws to the springs h and h', respectively.

I designates an arm carrying at its outer end a brake-shoe i, which shoe is adapted to frictionally engage the under face of the disk H'. The arm I is secured to the lower end of a depending sliding post I', passing through an opening in a lug I² on the frame A', said post being normally held up by the tension of a spring i', seated in a recess in the lug I² and bearing against a collar i² on the upper end of the post. The tension of the spring i' is such as to cause the brake-shoe i to bear against the disk H with such force as to prevent rotation of said disk when the parts are

in the position shown in the drawings, and consequently to prevent rotation of the shaft B. The post I' is slotted longitudinally to receive a wedge-shaped piece L, which bears
 5 against the bottom wall of the slot. The wedge L is provided with a handle L', extending upwardly through an opening *m* in the plate A². This handle is provided with an opening through which passes a rod *l*,
 10 forming a way to guide the longitudinal movement of the wedge L. When the motor is at rest, the rectangular end *l'* of the wedge L rests in the slot of the post I'.

To determine the angle of the wedge L, I
 15 depress the post I' to release the disk H and permit the motor to run at its maximum speed, in this particular instance two hundred rotations per minute. The distance the
 20 post I' has been depressed to permit the motor to run from zero to two hundred rotations per minute gives the height or base of the wedge. Then by starting at a suitable
 25 point—say two inches from the post—a right-angle triangle is drawn. The angle between the base and the hypotenuse gives the angle of the wedge. A wedge having substantially
 30 this angle is then made and mounted on the machine and the post depressed by the wedge to the position at which the maximum speed
 35 of the cylinder is attained. A mark is made on the plate A² to show the position of a pointer on a handle attached to the wedge. Then moving the wedge backward until by
 40 the friction between the brake-shoe and disk H the speed is reduced to, say, one hundred rotations per minute as the minimum a second
 45 mark is made on the plate A² to indicate the position of the wedge at the minimum speed. The distance between the two determined points of the scale may be divided as
 50 desired, it being evident that any point on the scale intermediate the extremes represents a position of the wedge which will determine the position of the arm I, so that the
 55 friction between the brake-shoe *i* and disk H will permit the rotation of the sound-record cylinder at a speed indicated on the scale. By moving the pointer back from the one
 60 hundred or minimum mark the motor will be brought to a stop.

The plate A² is made with an opening *m*, opposite which is a scale *n*, to which a pointer
 65 *l'* on the handle L' is moved to indicate and determine the speed of rotation of the sound-record cylinder.

To provide a yielding tension between the pinion G and wheel G', I interpose springs *e*³ and *e*⁴ between the base E and the frame A³,
 70 said springs surrounding the screws *a*³ and *a*⁴, respectively. Instead of springs I may employ a rubber cushion. The screws *a*¹ and *a*² pass through blocks or nibs *e*¹ and *e*², respectively, one of the bearings of both of said
 75 blocks being substantially a knife-edge.

65 The operation of the above-described mech-

anism is as follows: Suppose a sound-record to have been made, for example, at a speed of one hundred and forty rotations per minute and the same speed is to be maintained when the record is being reproduced.
 70 To secure this correspondence, after the cylinder has been placed upon the machine for reproduction the handle L' is moved until the pointer *l'* is over the hundred-and-forty
 75 mark on the scale *n*. This movement of the handle moves the wedge L to the right, depressing the post I', and with it the arm I, thereby releasing the shoe *i* from contact with the disk H and permitting the shaft B to rotate.
 80 The rotation of the shaft B causes the shaft F to rotate through the spiral wheel G' and pinion G. The movement of the wedge L causes the arm I and its brake-shoe *i* to assume a certain definite position, which will
 85 determine the ultimate speed of rotation of the sound-record cylinder. As the shaft F continues to rotate the balls H² and H³ are thrown outwardly, thus lowering the disk H into contact with the brake-shoe *i*, against
 90 which it presses with sufficient friction to reduce the rotation of the shaft B to that necessary to bring the rotation of the sound-record cylinder to the number indicated upon the
 95 scale *n*. This adjustment of the wedge L takes but an instant of time, and it may be said that practically the speed rotation of the sound-record cylinder is acquired the instant the indicator is moved to the required point on the scale.

Except when in position shown in the drawings, the power of the spring-motor is sufficient to overcome the friction between the disk H and the brake-shoe, so that the sound-record cylinder will be rotated, and the function of the wedge I is to effect such a relation
 100 between the disk H and shoe *i* as to generate sufficient friction to reduce the speed of rotation of the shaft B and, through the connections described, the rotation of the sound-record cylinder.
 105

My invention is applicable not only to phonographs and graphophones, but to other devices, such as music-boxes and other self-playing musical instruments driven by a
 110 motor.

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

1. A speed-governor for motors comprising in combination a driving shaft, a centrifugal governor to control the speed of rotation of
 115 said shaft, a disk rotating with and slidably mounted on the governor-shaft, a brake-shoe adapted to fractionally engage said disk, a slotted post on which said shoe is carried, a
 120 wedge seated in said slot, and means to move said wedge to adjust the position of the said shoe.

2. In a motor for use with phonographs, graphophones, and similar machines, the combination with a driving-shaft, of a gov-
 125 130

ernor actuated by said shaft by suitable gearing, a governor-frame, a support for said frame and a cushion interposed between said governor-frame and its support to provide a
5 yielding tension between said gears, substantially as described.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

GEORGE W. MERRILL, JR.

Witnesses:

GEO. E. CRUSE,

CHARLES S. JONES.