

**No. 666,609.**

**Patented Jan. 22, 1901.**

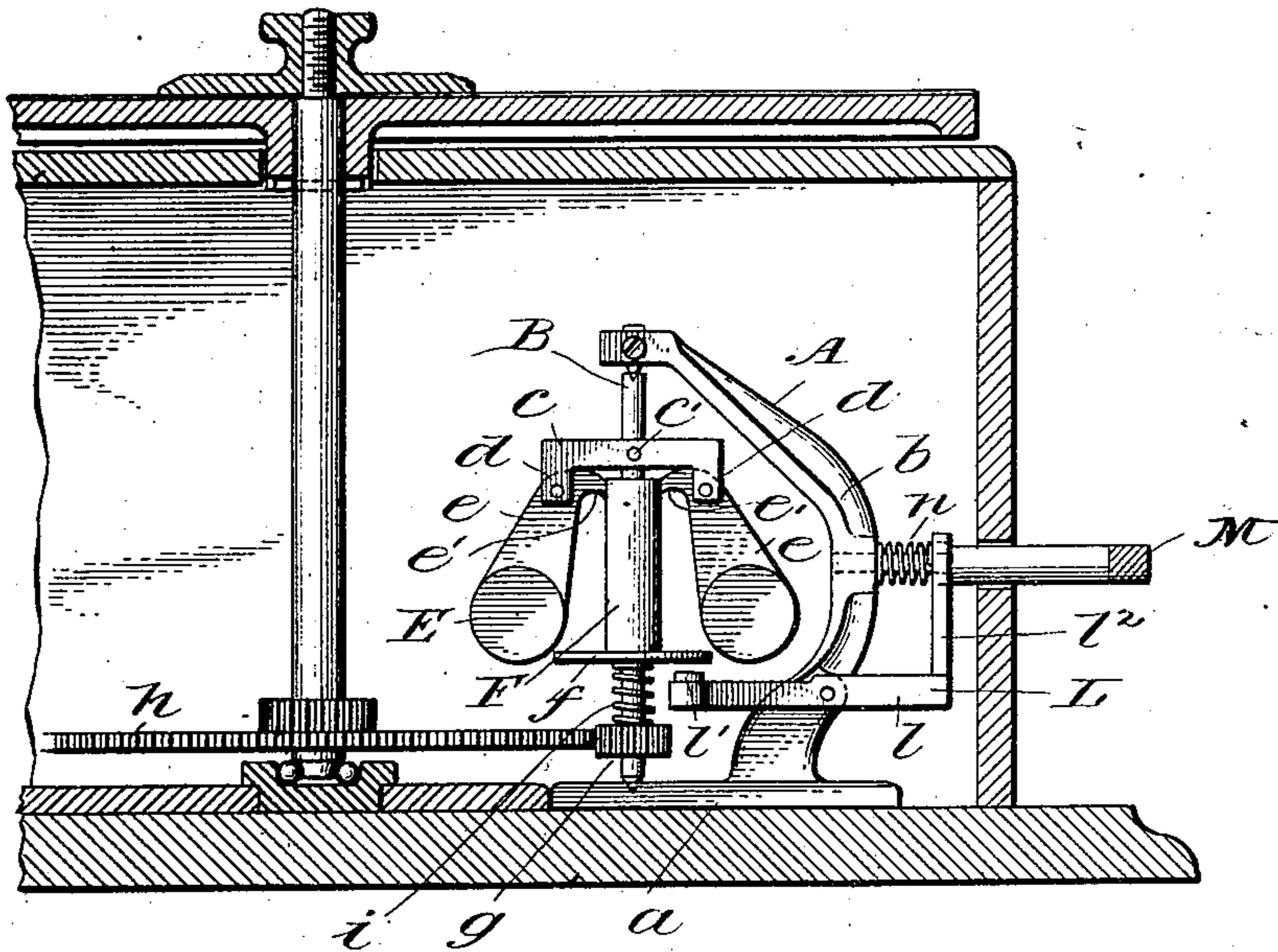
**B. G. ROYAL.**

**GOVERNOR FOR SPRING MOTORS.**

(Application filed June 22, 1899.)

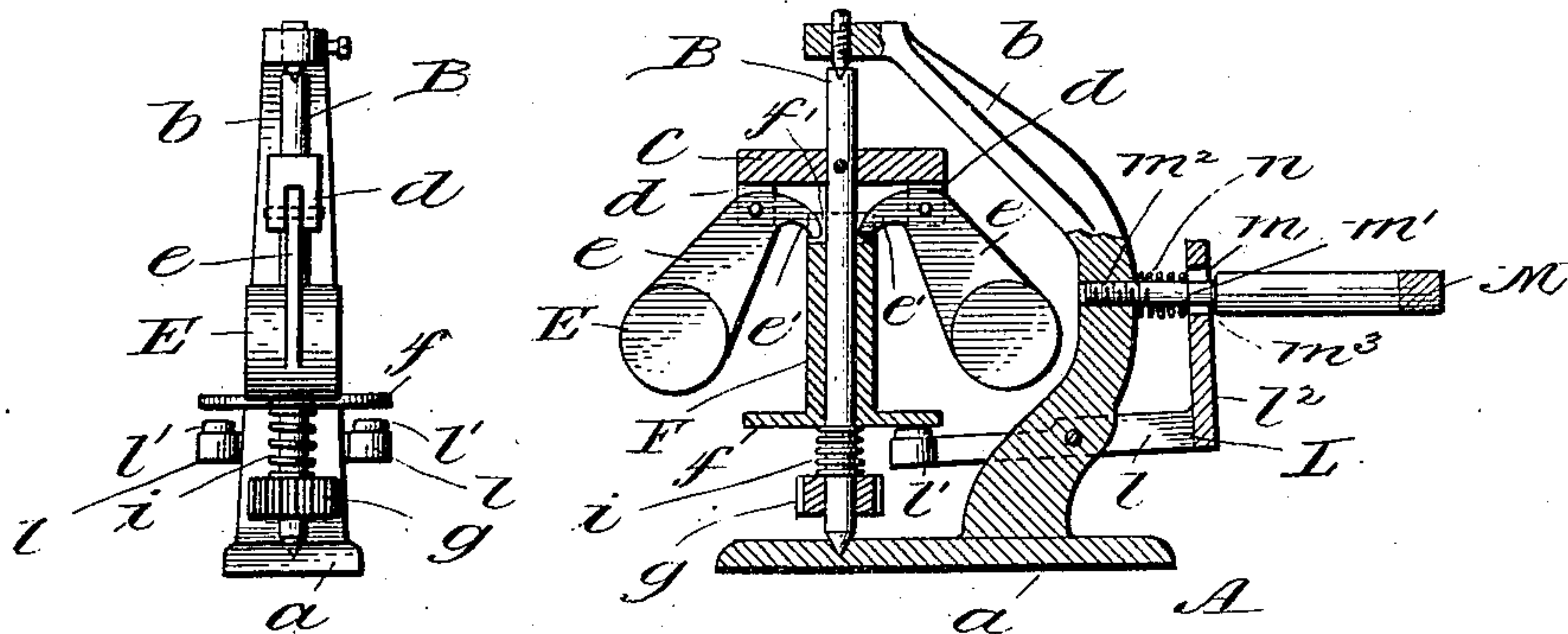
(No Model.)

*Fig. 1.*



*Fig. 2.*

*Fig. 3.*



Witnesses:  
Jno. T. Cross  
J. Henderson.

*Inventor*  
*Belford G. Royal,*  
*by Wm. Potts,*  
*Attorney.*



# UNITED STATES PATENT OFFICE.

BELFORD G. ROYAL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
THOMAS S. PARVIN, OF SAME PLACE.

## GOVERNOR FOR SPRING-MOTORS.

SPECIFICATION forming part of Letters Patent No. 666,609, dated January 22, 1901.

Application filed June 22, 1899. Serial No. 721,497. (No model.)

*To all whom it may concern:*

Be it known that I, BELFORD G. ROYAL, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Governors for Gramophone-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 an improved governor for gramophones and other sound-reproducing machines; and it consists in the construction as herein set forth.

One object of my invention is to simplify and cheapen the construction of devices of this character and also to produce a strong and durable governor, doing away with the delicate flat springs which are often used in this class of machines.

A further object of my invention is to provide a simple form of brake mechanism to act in combination with the governor mechanism, whereby the speed of the machine can be quickly regulated and controlled to suit the character of the reproduction to be made on the machine.

With these objects in view my invention consists in the construction, combination, and arrangement such as will be hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a sectional elevation of a portion of a gramophone, showing my improved governor in side elevation. Fig. 2 is an end view of the governor mechanism, and Fig. 3 is a sectional detail elevation of the same.

The supporting-frame A consists of a base-plate *a* and a curved arm *b*, in which the upper and lower ends of the governor-spindle B are journaled, preferably in pivot-bearings. On the upper portion of the spindle B, I provide a transversely-arranged arm *c*, rigidly secured thereto by means of a pin or rivet *c'* and having on each of its ends a slotted or bifurcated lug *d*. In the slotted portions of the lugs *d* I pivot the arms *e* of the governor-

balls E. Loosely mounted on the spindle B below the arm *c* is a sleeve F, having formed integral with its lower end the disk *f*. The up-

per end of the sleeve F is provided with a radial slot *f'*, into which the curved ends *e'* of the arms *e* rest. On the lower end of the spindle B is a pinion *g*, which meshes with a pinion *h*, which is driven by the motor mechanism.

Interposed between the pinion *g* and the lower end of the sleeve F is a coil-spring *i*, which serves to keep the said sleeve F up and the ball-supporting arms in their normal position, as illustrated in Fig. 1 of the drawings. Thus as the spindle B revolves and the balls F rise by centrifugal force the curved inner ends *e'* of the arms *e*, which rest in the slot *f* of the sleeve F, push the said sleeve *f* in a downward direction, which compresses the spring *i*, as shown in Fig. 3 of the drawings. As soon as the spindle slackens and the balls drop the spring *i* returns the sleeve to normal position.

Pivoted to the arm *b* of the frame A is a crank L, having the forked arms *l*, which project under the disk *f* on the sleeve F, a friction-teat *l'* being provided on each end, as illustrated. The portion *l<sup>2</sup>* of the crank is provided with a slot *m*, through which passes the reduced end *m'* of the operating-stud M. The inner end of the reduced portion *m'* is screw-threaded and adapted to engage a screw-threaded aperture *m<sup>2</sup>*, formed in the frame A. The shoulder *m<sup>3</sup>*, formed at the beginning of the reduced portion *m'*, bears against the arm *l<sup>2</sup>* of the crank. Interposed between the arm *l<sup>2</sup>* and the frame A is a coil-spring *n*, which allows the crank L to yield slightly as the disk *f* comes in contact with the teats *l'* and also keeps the arm *l<sup>2</sup>* in contact with the shoulder *m<sup>3</sup>*.

The operation of the above-described brake mechanism is as follows: As the governor-spindle revolves and the ball-arms *e* push the disk *f* downwardly the said disk will come into slight contact with the teats *l'*, carried by the arm *l*, and when it is desired to reduce the speed of the governor the stud M is turned or unscrewed partially from the threaded aperture *m<sup>2</sup>*, which moves the shoulder *m<sup>3</sup>* outwardly, and the coil-spring *n* forces the arm *l<sup>2</sup>* outwardly, and thereby causes the inner ends of the forked arms *l* and the teats *l'* to move upwardly into greater frictional contact with the disk *f*, and thus retard the speed



of the governor. When the stud M is turned in an opposite direction and its threaded end screwed into the aperture  $m^2$ , the shoulder  $m^3$  will bear against the arm  $l^2$  and force it inwardly, thereby throwing down the inner ends of the arms  $l$  and their teats  $l'$ , and thus decreasing the frictional contact between the said teats  $l'$  and the disk  $f$  or removing said teats entirely out of contact with said disk. The slot  $m$  is of a length sufficient to allow the lever L to be tilted sufficiently to remove the teats  $l'$  entirely away from contact with the disk  $f$ , and when this position is attained the spring  $n$  will be compressed between the arm  $l^2$  and the frame  $b$ .

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

1. In a governor for spring-motors, the combination with the governor-spindle of a loosely-mounted sleeve, F, having a disk,  $f$ , on its lower end, a spring,  $i$ , for supporting the same, a horizontally-disposed cross-arm,  $c$ , rigidly secured to the spindle above the sleeve, governor-balls, E, having arms,  $e$ , pivoted at their upper ends in cross-arm,  $c$ , and extensions,  $e'$ , formed on the inner ends of the arms,  $e$ , adapted to engage the top of the sleeve, F, substantially as described.

2. In a governor for spring-motors, the combination with the governor-spindle of a sleeve, F, loosely mounted thereon, a disk,  $f$ , formed on the lower end of said disk, a coiled spring,  $i$ , carried by the spindle adapted to bear against the under side of the sleeve, F, a horizontally-disposed cross-arm,  $c$ , rigidly secured to the spindle above the sleeve, F, lugs,  $d$ , formed on each end of the said cross-bar, governor-balls, E, having supporting-arms,  $e$ , pivoted at their upper ends to the lugs,  $d$ , extensions,  $e'$ , provided on the inner ends of the arms,  $e$ , and the slots,  $f'$ , provided on the upper end of the sleeve, F, adapted to be engaged by the extensions,  $e'$ , of the governor-arms, substantially as described.

3. The combination with the governor-spindle, of a spring-supported sleeve loosely mounted thereon having a friction-disk on its lower end, a rigid cross-arm carried by the

spindle, the governor-balls having arms pivoted to said cross-arm, extensions formed on the inner ends of the ball-arms adapted to rest on the upper end of the loosely-mounted sleeve, a pivoted brake-lever extending under the friction-disk on the movable sleeve, and means for operating said brake-lever, substantially as described.

4. The combination with the governor-spindle, of a spring-supported sleeve loosely mounted thereon having a friction-disk on its lower end, a rigid cross-arm carried by the spindle, the governor-balls having arms pivoted to said cross-arm, extensions formed on the inner ends of the ball-arms adapted to rest on the upper end of the loosely-mounted sleeve, a pivoted brake-lever extending under the friction-disk on the movable sleeve, a perpendicular arm,  $l^2$ , on the outer end of said lever having a slotted upper end, an operating-stud, M, having a reduced screw-threaded portion adapted to pass through the slot and engage the machine-frame and a coil-spring interposed between said frame and the perpendicular arm,  $l^2$ , substantially as described.

5. The combination with the governor-spindle, a movable sleeve, F, adapted to be thrown down by the centrifugal action of the balls, a friction-disk,  $f$ , carried on the lower end of said sleeve, a brake comprising the forked arm,  $l$ , having a teat on the end of each fork adapted to contact with the friction-disk,  $f$ , the said arm,  $l$ , being pivoted to the frame of the machine, a perpendicular arm,  $l^2$ , connected to the end of the forked arm, a slot,  $m$ , formed in said arm, an operating-stud, M, having a reduced end,  $m'$ , adapted to pass through the slot,  $m$ , and engage a screw-threaded opening,  $m^2$ , formed in the machine-frame, and a coiled spring,  $n$ , interposed between the frame and the arm,  $l^2$ , substantially as described.

In witness whereof I have hereunto set my hand this 10th day of March, A. D. 1899.

BELFORD G. ROYAL.

Witnesses:

BENJ. F. PERKINS,  
HOMER PETTIS.