

(No Model.)

2 Sheets—Sheet 1.

G. A. BRACHHAUSEN.
GOVERNOR MECHANISM.

No. 593,759.

Patented Nov. 16, 1897.

Fig. 1.

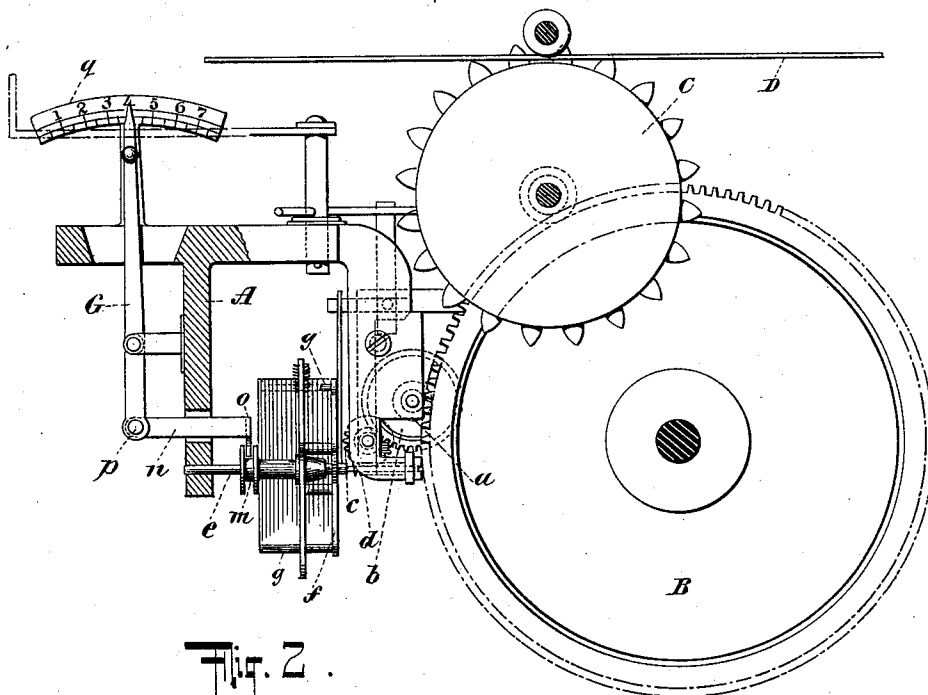


Fig. 2.

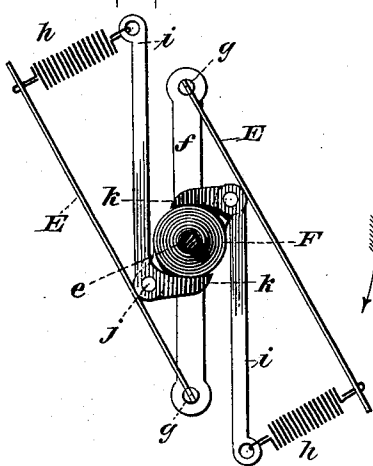


Fig. 3.

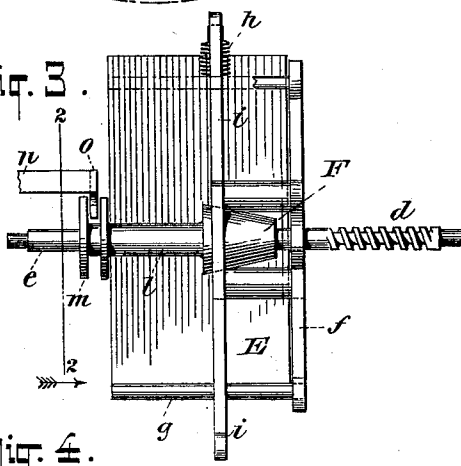
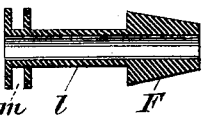


Fig. 4.



WITNESSES:

Gustave Dietrich
Charles E. Smith

INVENTOR

Gustav A. Brachhausen

BY

Brinner & Mauch
ATTORNEYS

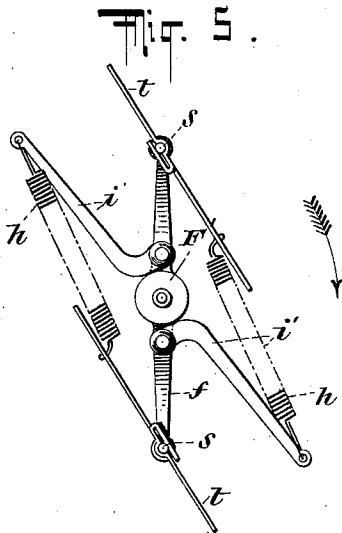
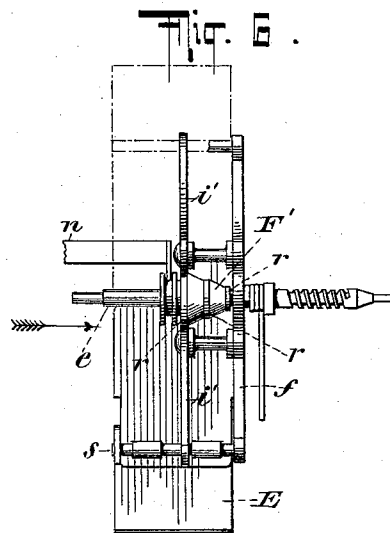
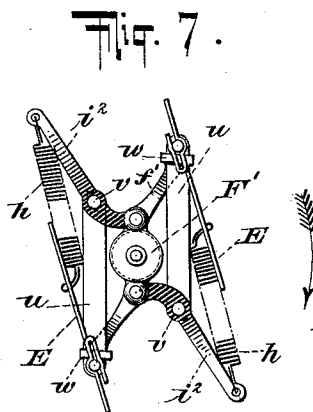
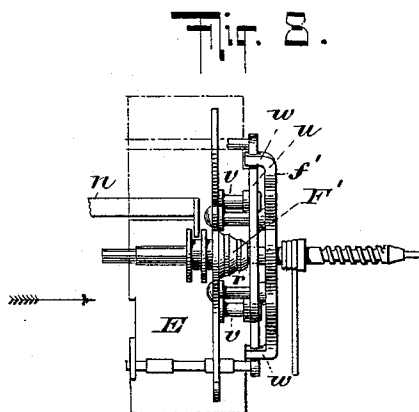
(No Model.)

2 Sheets—Sheet 2.

G. A. BRACHHAUSEN.
GOVERNOR MECHANISM.

No. 593,759.

Patented Nov. 16, 1897.



WITNESSES:

Gustavetietzsch.
Charles E. Smith

INVENTOR

INVENTOR
Gustav A. Bruchhausen
BY
Brisson & Traut
ATTORNEYS

UNITED STATES PATENT OFFICE.

GUSTAV A. BRACHHAUSEN, OF RAHWAY, NEW JERSEY.

GOVERNOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 593,759, dated November 16, 1897.

Application filed March 13, 1897. Serial No. 627,279. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. BRACHHAUSEN, residing at Rahway, Union county, State of New Jersey, have invented a new and Improved Governor Mechanism, of which the following is a specification.

My invention relates to an improved governor mechanism more particularly adapted for use in musical instruments for regulating the speed thereof.

In musical instruments as heretofore made governors have been provided which operated automatically to cause the instrument to be driven at a uniform rate of speed, and additional mechanism in the nature of a brake operable upon the shaft of the governor was provided to control the rate of speed at which the instrument was to be operated. In all such devices the application of the brake to slacken the speed of the governor causes the fly-fans to be brought nearer the center of rotation, which in itself would tend to allow the governor to be rotated at a higher rate of speed. For this reason great difficulty has been experienced heretofore in providing an efficient governor, and it has been found impossible to provide a governor wherein the automatic action was not interfered with by the application of the brake or hand regulating device.

The object of my invention is to provide a governor wherein the objections heretofore pointed out are overcome and which will be efficient under all conditions.

To these ends my invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, wherein like letters represent corresponding parts in the various views, Figure 1 is a side view, partly in section and with parts broken away, of a sufficient number of parts of a motor of a music-box to illustrate the application of my improved governor mechanism. Fig. 2 is a transverse sectional view on the line 2 2 of Fig. 3 of a modified form of governor mechanism embodying my invention. Fig. 3 is a side view of the same, on an enlarged scale, with parts broken away. Fig. 4 is a longitudinal sectional detail view of a portion of the device illustrated in Figs. 1, 2, and 3. Fig. 5 is an end view, looking in the direction

of the arrow, Fig. 6, of a further modified construction embodying my invention. Fig. 6 is a side view of the same with parts broken away for the purpose of clearer illustration. Fig. 7 is an end view, looking in the direction of the arrow in Fig. 8, of my preferred form of governor mechanism; and Fig. 8 is a side view of the same with parts broken away for the purpose of clearer illustration.

For the purposes of clearness I will first describe the modified form of my device illustrated in Figs. 1, 2, 3, and 4, after which a clearer understanding of my preferred construction will be had.

In the accompanying drawings, A represents the framing of a motor, which preferably supports a mainspring-barrel B, from which is driven a train of gear *a b c* and a sprocket-wheel C, which is intended to engage the note sheet or disk D to operate a musical instrument. The gear *c* operates upon the worm *d* of the governor-shaft *e* in the usual manner. Upon the governor-shaft *e* is carried a rigid arm or support *f*, to which are pivotally connected, as at *g*, the governing elements or wings E. The free end of each of these wings is connected with a coiled spring *h*, which is in its turn connected with the free end of a controlling arm or lever *i*. In Figs. 1, 2, and 3 each of these arms or levers *i* consists of a bell-crank lever pivoted, as at *j*, to the support *f*, the short arm *k* of each of these levers being adapted to bear against a cam F, which is preferably in the form of a frustum of a cone. This cam F preferably constitutes a part of a sleeve *l*, which by preference is loosely carried and movable longitudinally on the shaft *e* of the governor. The sleeve *l* is likewise provided with means, such as the channeled end *m*, for engagement with means for moving the cam and sleeve longitudinally on the shaft. This means for moving the cam is shown in the present instance to consist of a plunger-rod *n*, having a yoke *o* at one end thereof, which is adapted to engage the channeled end of the sleeve *l*. The opposite end of this plunger is pivoted at *p* to a pivoted lever G, the free end of which preferably constitutes a pointer which coöperates with a scale *q*, carried upon a stationary portion of the instrument to indicate the position to which the cam F is moved.

It will be observed that by this construction a governor is provided wherein the cam F may be adjusted by the operator to cause the arms or levers i to be moved toward and away from the center of rotation of the governor and to be maintained in the position to which it has been moved. The effect of operating the cam to control the levers in the manner described results in varying the distance of the fans to and from the center of rotation of the governor. At the same time the adjustment of the cam in no way affects the automatic expansion of the wings to cause the instrument to be driven at a uniform rate of speed. It is thought that from the foregoing description the operation of the device illustrated in Figs. 1, 2, 3, and 4 will be apparent. It will be understood, of course, that the governor rotates in the direction of the arrow in Fig. 2, and the expansion of the wings not only tends to carry the wings or governing elements farther from the center of rotation, but likewise carries them out of the overlapping position, so as to present a greater surface area for contact with the atmosphere.

In Figs. 5 and 6 a second modified form of my device is illustrated. In this construction the cam F' acts against each of the arms i' intermediate of its length instead of against a free end of each of the arms or levers, as in Figs. 1 to 4. Furthermore, it will be observed that the arms in Figs. 5 and 6 instead of bearing upon the inclined faces of the cam when the arms are in a set position rest upon one of a series of circumferential flattened portions r , so that there is no liability of the frusto-conical cam being moved from the position in which it is set. In Figs. 5 and 6 the wings instead of being mounted at the ends, as in Figs. 1, 2, and 3, are pivoted intermediate of their lengths, as indicated at s , so that an expansion of the wings causes the ends t to swing inward, so as to fill a space which would be unoccupied in the construction illustrated in Figs. 1, 2, and 3. The operation of the construction illustrated in Figs. 5 and 6 is similar to that shown in Figs. 1, 2, and 3. The cam F', being operated by the lever G to increase or decrease the distance of the free ends of the levers i' from the center of rotation of the governor, will cause the wings to be swung on their pivots to vary the distance from the center of rotation of the governor, and yet the wings are free to automatically expand when rotation of the governor is such that the atmospheric pressure and centrifugal force will overcome the tension of the springs h , it being understood that the governor rotates in the direction of the arrow, Fig. 5.

In Figs. 7 and 8 the preferred form of my device is illustrated. In these figures the cam and mechanism for shifting it is substantially the same as that illustrated in Figs. 5 and 6, the frusto-conical cam F', with the steps or circumferential flattened portions r , being provided. The wings E in these figures

instead of being carried upon an arm or plate which is fixed to the shaft are each carried upon a supporting lever or arm u , which is pivotally connected with a controlling-lever i^2 , as indicated at v . Each of the levers or arms u is adapted to slide within a sleeve w , carried upon the supporting-arm f' , which is rigidly connected with the shaft of the governor. The springs h are connected with the governing elements or wings e and with the free ends of the controlling arms or levers i^2 in substantially the same manner as indicated in the other constructions. The frusto-conical cam F' in this construction bears against the controlling-arms i^2 intermediate of their lengths in the manner indicated in Figs. 5 and 6. It will be observed that by this construction a movement of the cam against the controlling arms or levers i^2 not only brings about a movement of the free ends of the wings around their pivots in a direction to and from the center of rotation of the governor, but likewise causes the pivots upon which said wings are mounted to vary their distances from the center of rotation of the governor. The operation of this my preferred form of device is similar to that of the constructions hereinbefore described, with the exception just pointed out, that a movement of the controlling-arms to vary the distance of the outer ends thereof from the center of rotation likewise causes the pivots of the governing elements to be moved to vary the distance from the center of rotation of the governor. The automatic expansion of the governing elements is brought about in the same manner as that described with reference to the other constructions. The governor being rotated in the direction of the arrow, Fig. 7, allows of the expansion of the wings from the overlapping position when the centrifugal force and atmospheric pressure against the wings is such that the tension of the springs h will be overcome.

It will be seen that in each of the constructions illustrated and described the cam which constitutes the means for varying the distance of the governing elements from the center of rotation of the governor is loosely carried upon the governor and is adapted to rotate with the governor, so that there is no braking action between the governing elements and the adjusting means therefor.

While I have referred to my improved governor mechanism in connection with a motor of a music-box, it is obvious that it may be employed for other purposes, and reference is made to a motor for music-boxes to more clearly illustrate the utility of my invention. While I have shown and described certain specific mechanism for attaining the ends described, I would have it distinctly understood that I do not limit myself to the construction and arrangement of parts described, inasmuch as various changes may be made without departing from the spirit of my invention.

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

1. In a governor mechanism, the combination of overlapping automatically-expanding wings and means under control of an operator during the rotation of the governor for varying the distance of said wings from the center of rotation of the governor independently of the automatic operation thereof and for increasing or decreasing the extent to which said wings overlap.

2. In a governor mechanism, the combination of overlapping automatically-expanding pivoted wings and means under control of the operator for varying the distance of said wings from the center of rotation of said governor and for increasing or decreasing the extent to which said wings overlap.

3. In a governor mechanism, the combination of pivoted governing elements and means under control of the operator for varying the distance of the pivots of said elements from the center of rotation of said governor.

4. In a governor mechanism, the combination of overlapping pivoted wings and means under control of the operator for varying the distance of said wings from the center of rotation of said governor and for increasing or decreasing the extent to which said wings overlap.

5. In a governor mechanism, the combination of pivoted wings and means under control of the operator for varying the distance of the pivots and free ends of said wings from the center of rotation of said governor.

6. In a governor mechanism, the combination of automatically-expanding pivoted wings and means under control of the operator for varying the distance of the pivots and free ends of said wings from the center of rotation of said governor.

7. In a governor mechanism, the combination of pivoted governing elements, movable arms, a spring connecting each of said arms with a pivoted governing element and means for moving said arms to vary the distance of

the governing elements from the center of rotation of said governor.

8. In a governor mechanism, the combination of pivoted governing elements, movable arms, a spring connecting each of said arms with a pivoted governing element, a movable cam contacting with said arms to vary the distance of the governing elements from the center of rotation of said governor and means under control of the operator for moving said cam.

9. In a governor mechanism, the combination of pivoted governing elements, movable arms, a spring connecting each of said arms with a pivoted governing element, a frusto-conical cam longitudinally movable upon the governor-shaft and adapted to contact with the arms to vary the distance of the governing elements from the center of rotation of the governor.

10. In a governor mechanism, the combination of pivoted governing elements, movable controlling-arms, a connection between the free portion of each of said governing elements and one of said arms, a second arm connected with each of said controlling-arms, each of said second-named arms being pivotally connected with a governing element and means under control of the operator for moving the controlling-arms to vary the speed of the governor.

11. In a governor mechanism, the combination of pivoted governing elements, movable controlling-arms, a spring connecting each of said arms with a pivoted governing element, a supporting-arm connected with each of said controlling-arms, each of said supporting-arms constituting a carrier for a governing element and means for moving the said controlling-arms to vary the distance of the governing elements from the center of rotation of the governor.

GUSTAV A. BRACHHAUSEN.

Witnesses:

CHARLES E. SMITH,
HARRY M. TURK.