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H. L. T. BUCKLE

GOVERNOR FOR TALKING MACHINES

Filed March 15, 1924

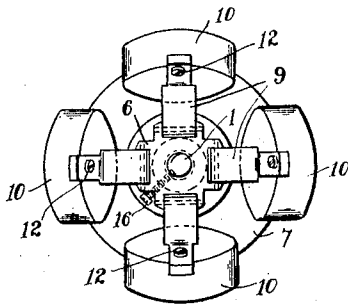


Fig. 3.

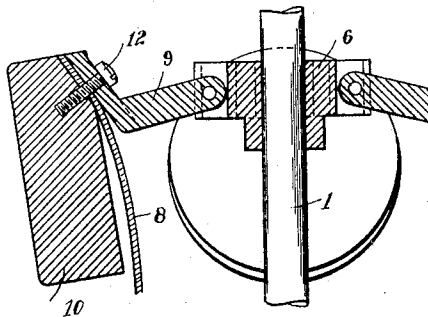


Fig. 4.

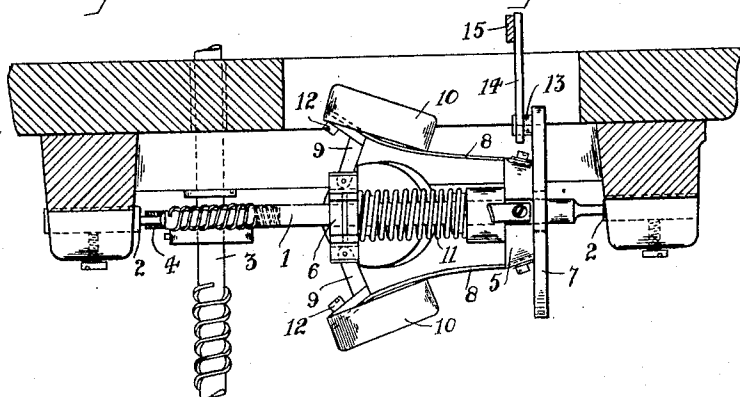


Fig. 1.

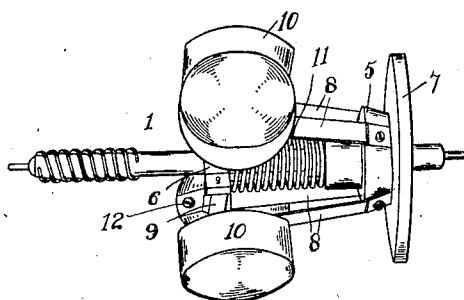


Fig. 2.

INVENTOR

Horace Leopold Tucker Buckle.

BY

Anderson & Walton
ATTORNEYS

UNITED STATES PATENT OFFICE.

HORACE LEOPOLD TUCKER BUCKLE, OF YIEWSLEY, ENGLAND, ASSIGNOR TO VICTOR TALKING MACHINE COMPANY, A CORPORATION OF NEW JERSEY.

GOVERNOR FOR TALKING MACHINES.

Application filed March 15, 1924. Serial No. 699,583.

To all whom it may concern:

Be it known that I, HORACE LEOPOLD TUCKER BUCKLE, a subject of the King of Great Britain, residing at Yiewsley, Middlesex, England, have invented new and useful Improvements in Governors for Talking Machines, of which the following is a specification.

This invention relates to improvements in governors for talking machines and is particularly intended to meet the requirements of disc machines of the type in which the record is caused to rotate at a continuously increasing or decreasing speed, instead of at a constant speed, as is generally the case to-day.

In machines of this type the desired end may be attained either by running the motor at a constant speed, with a variable transmission to the turntable, or by allowing the speed of rotation of the motor to increase (for example by acting on the governor of the motor) as the needle travels across the record.

The governor according to the present invention is designed more particularly for use with the latter class of machine.

The object of the present invention is to provide an improved form of governor whereby more uniformly efficient control of the speed of the motor is secured over the whole range of speeds that occur in such machines.

The usual construction of governor used in talking machines comprises a spindle rotated by the motor, a collar fixed on the spindle, a second collar adapted to slide on the spindle and carrying a friction disc and connecting members in the form of leaf springs fixed between the two collars and carrying weights, which are thrown outwards by centrifugal force, against the action of the leaf springs, on the rotation of the spindle and draw the friction disc against an adjustable friction pad. In some cases a helical spring may be placed between the two collars, around the governor spindle, to assist in resisting the pull of the weights. In variable speed machines of the type above specified, this friction pad is moved as the needle travels over the record, so that the governor speed and consequently the motor speed is being continuously varied. While the usual form of governor gives efficient results at speeds, say from 75 to 85 revolu-

tions per minute of the turntable, enough to cover the usual recording and reproducing speeds, it is not efficient for the 100% to 200% increases in speed that may be called for in variable speed machines.

According to the present invention, in order to prevent the pull of the weights on the governor disc becoming excessive, the weights are mounted on the connecting members between the fixed and sliding collars substantially nearer to one collar than to the other, and they are preferably mounted nearer to the fixed collar, the distance of the weights from the fixed collar being for example about one half to one third the distance of the weights from the sliding collar. The shorter portions of the connecting members may be in the form of rigid arms pivotally attached to the fixed collar, and the longer portions may be in the form of leaf springs attached to the other collar.

In the accompanying drawings, which illustrate one form of governor according to this invention,

Fig. 1 is a side elevation showing the governor in position of rest mounted on the motor board of a machine.

Fig. 2 is a perspective view of the governor slightly extended by rotation.

Fig. 3 is an end view of the governor from the left hand side of Fig. 1 and

Fig. 4 is an enlarged detail view showing the manner of mounting the weights.

The governor spindle 1 which lies horizontally revolves in suitable bearings 2, 2 and is geared to the turntable spindle 3 which it governs, in known manner, as by means of a worm 4. The turntable spindle 3 is driven by a motor, not shown in the drawings. Two collars are fitted on the governor spindle, one collar 5 being free to slide and the other collar 6 being fixed to the spindle by a screw or pin 16. Mounted on the sliding collar 5 is the usual friction disc 7 and between and connecting the two collars are four connecting members equally spaced and each comprising a leaf spring 8 and a bent rigid member 9. Each rigid member 9 is pivoted to the collar 6 in the manner shown in Figs. 3 and 4 and each spring 8 is secured to the collar 5. The rigid members and springs meet each other at the points to which the weights 10 are fixed, see Fig. 4. Screws 12 serve to secure the springs 8 and rigid members firmly together

and to the weights 10. Between the collars 5, 6 and tending to hold them apart is a spiral spring 11 wound round the governor spindle 1. A friction pad 13 adapted to bear against the disc 7 is carried by an arm 14 mounted on a lever 15, which is adapted to be moved to the left or right (in Fig. 1) by means operated from the motor or from the sound arm (or, when the machine is set to run at constant speed to play the ordinary record of to-day, by a hand operated lever for example). As the governor rotates, the weights 10 fly outwards, tending to straighten the slightly curved springs 8 and to pull the disc 7 towards the left (in Fig. 1) and compress the spring 11.

Now the force with which the governor disc 7 tends to move along the spindle 1 towards the friction pad 13 is determined by the extent to which the pull, exerted on the governor disc by the governor weights 10, exceeds the resistance offered by the spiral spring 11, in any given position of the governor weights, i. e. at any given speed. The pull of the weights increases rapidly with the distance they move away from the axis of rotation, and therefore it is desirable that the weights should not move too far away and consequently that they should be connected to the spindle by relatively short members. It is also desirable that the friction disc 7 should be capable of a reasonably extensive travel, as that assists in obtaining accurate working without too fine adjustments. Further, in order that the pull of the weights 10 upon the friction disc 7 may be most effective it is desirable that the weights 10 should be connected to the sliding collar 5 by relatively long members.

These several conditions are best satisfied by making up the connecting members between the collars 5 and 6 each of a short connecting member and a long connecting member, the long connecting member for example being two or three times the length of the short connecting member and pivoting the short connecting members 9 to the fixed collar 6 and attaching the long connecting members 8 to the sliding collar 5 which carries the friction disc.

In the governor described above four weights 10 are used, but the number of weights may be varied so long as they are disposed in a balanced relation with respect to the axis of said spindle.

By suitable variation of the dimensions of the governor, the range of speeds over which it is effective can be varied. The governor illustrated herein gives efficient and accurate control over a range of speeds equivalent to a hundred per cent increase. But this is by no means the limit of efficiency of the improved governor.

I claim:

1. A centrifugal governor for talking machines, of the type comprising a rotating spindle, a fixed collar thereon, a sliding collar and friction disc thereon, connecting members between the collars, weights carried by said connecting members, and resilient means adapted to hold the collars normally apart, characterized by the fact that the weights are mounted on the connecting members substantially closer to one collar than to the other.

2. A governor according to claim 1 wherein the weights are mounted substantially closer to the fixed collar than to the sliding collar.

3. A governor according to claim 1 wherein the distance of the weights from one collar is more than twice the distance of the weights from the other collar.

4. A governor according to claim 1 wherein the shorter connecting members are in the form of rigid arms pivotally attached to one collar and the collars are normally held apart by a helical spring around the governor spindle.

5. A governor according to claim 1 wherein the weights are attached to the fixed collar by relatively short rigid arms and to the sliding collar by relatively long leaf spring members.

6. In a centrifugal governor, the combination of a rotating spindle, a friction disk mounted on said spindle to slide longitudinally thereof, and a plurality of weights disposed in a balanced relation with respect to the axis of said spindle, each weight being provided with a connecting member having one end attached to said weight and the opposite end attached to said spindle, and with a second connecting member having one end attached to said weight and the opposite end attached to said friction disk, each weight being substantially closer to said opposite end of one of said members connected thereto, than it is to the said opposite end of the other of said members connected thereto.

7. In a centrifugal governor, the combination of a rotating spindle, a friction disk mounted on said spindle to slide longitudinally thereof, and a plurality of weights disposed in a balanced relation with respect to the axis of said spindle, each weight being provided with a connecting member having one end attached to said weight and the opposite end attached to said spindle, and with a second connecting member having one end attached to said weight and the opposite end attached to said friction disk, each weight being substantially closer to said opposite end of the connecting member attached thereto and to said spindle, than it is to the said opposite

end of the other member attached thereto and to said disk.

8. In a centrifugal governor, the combination of a rotating spindle, a friction disk
5 mounted on said spindle to slide longitudinally thereof, and a plurality of weights disposed in a balanced relation with respect to the axis of said spindle, each weight being provided with a connecting member
10 having one end attached to said weight and the opposite end attached to said spindle, and with a second connecting member having one end attached to said weight and the
15 opposite end attached to said friction disk, the distance between each weight and the said opposite end of the member attached

thereto and to said disk, being more than twice the distance between said weight and the said opposite end of the member attached thereto and to said spindle.

9. In a centrifugal governor, the combination of a rotating spindle, a friction disk
20 mounted on said shaft to slide longitudinally thereof, a plurality of weights disposed in a balanced relation with respect
25 to the axis of said spindle, a short rigid arm connecting each weight to said spindle and a relatively long flexible member connecting each weight to said disk.

In testimony whereof I have signed my
30 name to this specification.

HORACE LEOPOLD TUCKER BUCKLE.