L. S. HETH AND F. C. PALMERLEE.

DRIVING MECHANISM.

APPLICATION FILED MAR. 22, 1919.

1,407,032. Patented Feb. 21, 1922.

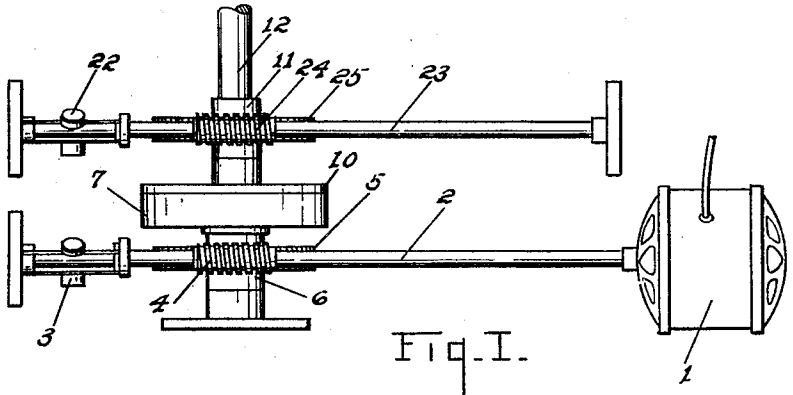


Fig. I.

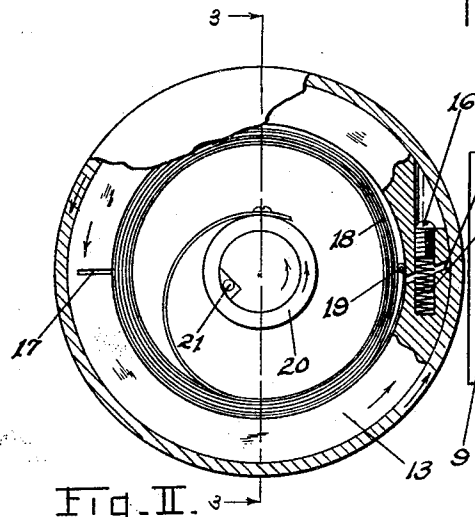


Fig. II.

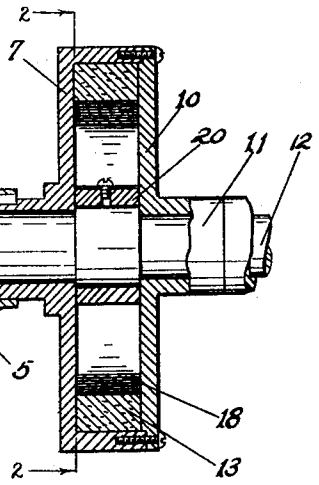


Fig. III.

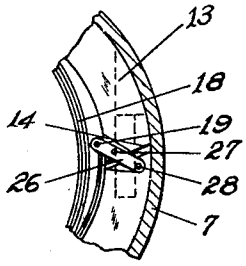


Fig. IV.

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DRIVING MECHANISM.

1,407,032. Specification of Letters Patent. **Patented Feb. 21, 1922.**

Application filed March 22, 1919. Serial No. 284,266.

To all whom it may concern:

Be it known that we, LEONIDAS S. HETH and FRANK CLARE PALMERLEE, citizens of the United States, residing at Grand Rapids, county of Kent, State of Michigan, have invented certain new and useful Improvements in Driving Mechanisms, of which the following is a specification.

This invention relates to improvements in driving mechanisms.

Our improvements are especially designed by us for embodiment in electric motor driven phonographs and we have illustrated our improvements as we have adapted or embodied them in such a structure. Our improvements are, however, adapted for use in other relations where a constant speed of the driven member is desired.

The main objects of our invention are:

First, to provide an improved driving mechanism by means of which a uniform speed of the driven member may be maintained even though the speed of the driving shaft or motor varies.

Second, to provide an improved driving mechanism well adapted for electric motor driven phonographs.

Third, to provide an improved driving mechanism adapted to maintain a uniform speed of the driven member which is simple and compact in structure and at the same time durable and not likely to get out of repair.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Fig. I is a detail side elevation of a structure embodying the features of our invention, various parts being shown conventionally.

Fig. II is a detail view partially in section on a line corresponding to line 2—2 of Fig. III.

Fig. III is a detail view partially in section on a line corresponding to line 3—3 of Fig. II.

Fig. IV is a detail view showing a modification of certain parts shown in Fig. II.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, 1 represents an electric motor. 2 the motor or power shaft which, in the structure illustrated, is provided with a governor, shown conventionally at 3.

The shaft 2 is provided with a worm 4 meshing with the worm gear 5 on the hub 6 of the friction driving drum 7. This friction driving drum is supported by the stub shaft 8 carried by the base or mounting plate 9.

For convenience in assembling the drum 7 has a removable top plate 10. The drum plate 10 has a bearing 11 thereon for the lower end of the driven shaft 12 which, in the structure illustrated, is the table spindle of a phonograph.

Within the driving drum 7 is a driven friction clutch ring 13 split at 14, its split ends being oppositely bored to receive the actuating spring 15. The tension of this actuating spring is adjusted by the screw 16. The clutch member 13 is slotted at 17 to permit more easy expansion and contraction of the ring for engaging and disengaging the clutch.

Within the drum we arrange a coiled driving spring 18 similar to a clock spring. The outer end of this spring is secured to the driven clutch member at 19 and its inner end to a collar 20. This collar has, in the structure illustrated, a roller ratchet driving connection, designated generally by the numeral 21, to the driven shaft 12. The advantage of this ratchet connection is that in an embodiment such as a phonograph it permits the turning of the table spindle by hand without affecting the driving mechanism.

The driven shaft is provided with a governor, designated generally by the numeral 22. The shaft 23 of the governor is provided with a worm 24 meshing with the worm gear 25 secured to the driven shaft.

In the modification shown in Fig. IV the outer end of the spring 18 is connected to a lever 26 which is secured by the pivot 27 to one end of the clutch member 13 and by the

pivot 28 to the other end thereby increasing the releasing movement of the driven clutch member.

In operation the speed of the motor shaft is normally somewhat in excess of that of the driven shaft. This excess of speed in the motor shaft causes the driving spring to be wound until the tension thereon is sufficient to release the clutch and the clutch slips. In the event the speed of the motor shaft should fall below that of the driven shaft the driving spring 18 will drive the driven shaft for a substantial period until the motor again picks up in ordinary variations, thus securing a uniform speed for the driven shaft. This driving mechanism is particularly desirable for electrically driven phonographs, where the speed must be uniform, and electric motors, particularly of the small type, owing to variations in current and other causes, which are subject to considerable variations in speed even when great care is employed in their manufacture.

We have illustrated and described our improvements in an embodiment which we have found very satisfactory. We have not attempted to illustrate other embodiments and adaptations as we believe the disclosure made will enable those skilled in the art to which our invention relates to embody or adapt the same as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a driving mechanism, the combination with a motor shaft, of a driving friction clutch drum having driving connections to said motor shaft, a split driven friction clutch ring within said drum, an actuating spring for said ring, a driven shaft disposed axially of said drum, a collar on said driven shaft having a driving ratchet connection thereto, and a driving spring disposed within said ring with its inner end secured to said collar and its outer end secured to said ring adjacent the split thereof releasing the clutch when its tension overcomes the actuating spring.

2. In a driving mechanism, the combination of a driving friction clutch drum, a split driven friction clutch ring within said drum, an actuating spring for said ring, a driven shaft disposed axially of said drum, a collar on said driven shaft having a driving ratchet connection thereto, a driving spring disposed within said ring with its inner end secured to said collar and its outer end secured to said ring adjacent the split thereof releasing the clutch when its tension overcomes the actuating spring.

3. In a driving mechanism, the combination with a motor shaft, of a driving friction clutch drum having driving connections to said motor shaft, a split driven friction clutch ring within said drum, an actuating spring for said ring, a driven shaft disposed axially of said drum, and a driving spring disposed within said ring with its inner end connected to said driven shaft and its outer end secured to said ring adjacent the split thereof releasing the clutch when its tension overcomes the actuating spring.

4. In a driving mechanism, the combination of a driving friction clutch drum, a split driven friction clutch ring within said drum, an actuating spring for said ring, a driven shaft disposed axially of said drum, and a driving spring disposed within said ring with its inner end connected to said driven shaft and its outer end secured to said ring adjacent the split thereof releasing the clutch when its tension overcomes the actuating spring.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

LEONIDAS S. HETH. [L. S.]
FRANK CLARE PALMERLEE. [L. S.]

Witnesses:
EDWARD L. WAGNER,
LOUIS NEUMANN.