J. WOLFF.

GEARING.

APPLICATION FILED MAY 20, 1916.

1,282,349. Patented Oct. 22, 1918.

Fig. 1

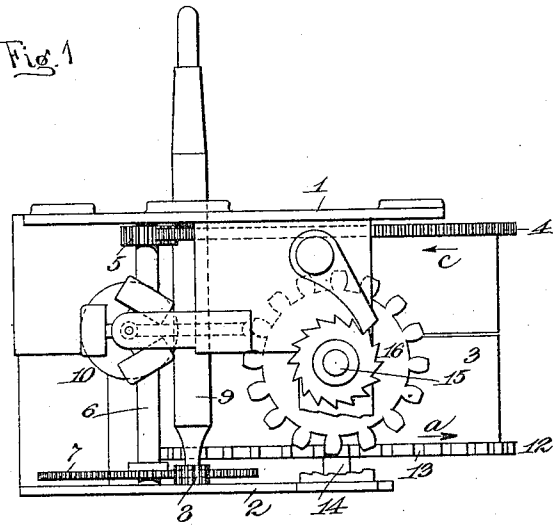


Fig. 3

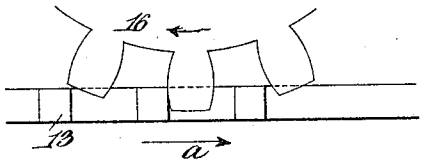


Fig. 4

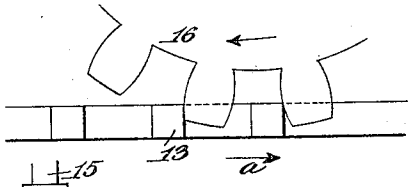


Fig. 2

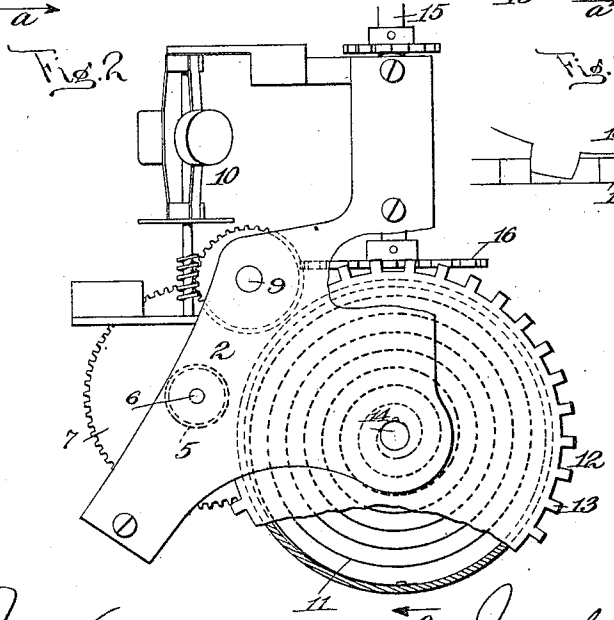
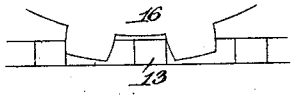


Fig. 5



Witnesses:

May Jones

Bessie Shriver

Inventor

Joseph Wolff

by Schechter & Lotsch

his Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH WOLFF, OF BROOKLYN, NEW YORK, ASSIGNOR TO SONORA PHONOGRAPH CORPORATION, A CORPORATION OF NEW YORK.

GEARING.

1,282,349. Specification of Letters Patent. Patented Oct. 22, 1918.

Application filed May 20, 1916. Serial No. 98,835.

To all whom it may concern:

Be it known that I, JOSEPH WOLFF, a subject of the King of Great Britain and Ireland, and a resident of the borough of Brooklyn, in the county of Kings, State of New York, have invented a certain new and useful Improvement in Gearing, of which the following is a specification.

My invention relates to gearing, and more particularly to the winding gear of spring motors, such as are commonly employed in talking machines, and my object is to produce a form of tooth gearing which will be noiseless in operation.

This and further objects will more fully appear in the following specification and accompanying drawings, considered together or separately.

I have illustrated one embodiment of my invention in the accompanying drawings, in which like parts in all the different figures are designated by similar reference characters, and in which,—

Figure 1 is an end view of a spring motor provided with my invention, and with parts broken away;

Fig. 2 is a bottom plan view of the same, with parts broken away;

Figs. 3 and 4 are diagrammatic views showing the operation of the gears; and

Fig. 5 is a diagrammatic view of a modification.

In all the drawings, 1 designates the base plate by means of which the motor is secured in its cabinet, and 2 is a bottom plate supported by and spaced apart from the base plate.

Mounted between the base and bottom plates is a divided spring drum 3, one section of which is provided with a spur gear 4, which meshes with a pinion 5 on a counter-shaft 6. The counter-shaft carries a spur gear 7 which meshes with a pinion 8 on a turn-table shaft 9, which projects through the base plate and is adapted to receive and support a suitable turn-table (not shown). The shaft 9 has geared thereto a governing device 10, by means of which the rate of unwinding of the spring 11 in the drum 3 is regulated.

At the end of the spring drum section, opposite the gear 4 is a circular rack 12 secured to the drum. This rack encircles the drum, and consists of radial teeth 13 having parallel sides.

The teeth 13 are narrow relatively to the pitch, so that the space between the teeth is considerably greater than the width of the teeth.

The spring 11 is anchored to the inside of the upper half of the drum, and to the drum shaft 14 attached to the lower half of the drum and in unwinding tends to rotate the rack 12 in the direction of the arrow *a*, and the gear 4 in the direction of the arrow *c*.

A winding shaft 15 is journaled in the motor frame, and is disposed at right angles to the shaft 14. One end of the winding shaft projects outward and through the wall of the cabinet, and is provided with means for the attachment of a crank (not shown) and at its inner end with a pinion 16, the teeth of which engage the rack 12. The sides of the teeth of the pinion 16 are well rounded outside of the pitch line. The shape of the teeth inside the pitch line is immaterial, and in fact this part of the teeth may be omitted, as shown in Fig. 5, where the roots of the teeth are on the pitch line.

The winding shaft is provided with a pawl and ratchet by means of which backward movement is prevented.

The operation of my improved gearing is as follows:

The winding shaft is turned in the clockwise direction and through the pinion 16 and rack 12 the spring 11 is wound. The tendency of the spring to unwind will always exert pressure in the direction of the arrow *a* and hold the engaging teeth of the rack against the left side of the teeth of the pinion. The teeth are so proportioned and disposed that before one tooth of the pinion leaves a tooth of the rack, a second pinion tooth will engage a second rack tooth. The curvature of the pinion teeth is such that they will contact with the rack teeth gradually and silently. The fact that the teeth engage at one side only greatly eliminates friction and reduces noise.

The rear or non-engaging sides of the pinion may be made of any shape as they have no work to perform, and the same is true of the non-engaging sides of the rack teeth.

If desired, the teeth may be reversed that is the rounded teeth may be carried on the drum and the straight sided teeth on the pinion.

In accordance with the provisions of the

patent statute, I have described the principle of my invention together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative and that the invention can be carried out in other ways.

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

A winding gearing for talking machine motors, comprising a circular rack and a pinion, the axis of the pinion being perpendicular to the axis of the rack, means for rotating the pinion, a pawl and ratchet mechanism for preventing rotation of the pinion in one direction, a spring so arranged relatively to the rack that it will be placed under tension by the movement of the pinion, the unwinding of the spring tending to hold the rack and pinion against the pawl and ratchet mechanism, whereby one side only of the teeth of the pinion and rack will engage, the engaging faces of the rack teeth being straight and the engaging faces of the pinion teeth being convex, the spring being so arranged that it will be wound at one end by the movement of the rack and will unwind at its other end, and mechanism coöperating with said other end.

This specification signed and witnessed this 15th day of May, 1916.

JOSEPH WOLFF.

Witnesses:
WM. VARIN,
M. A. KERNEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."