H. C. NIBLACK.

SOUND REPRODUCING MACHINE.

APPLICATION FILED JUNE 23, 1913. RENEWED APR. 13, 1917.

1,282,916. Patented Oct. 29, 1918.

2 SHEETS—SHEET 1.

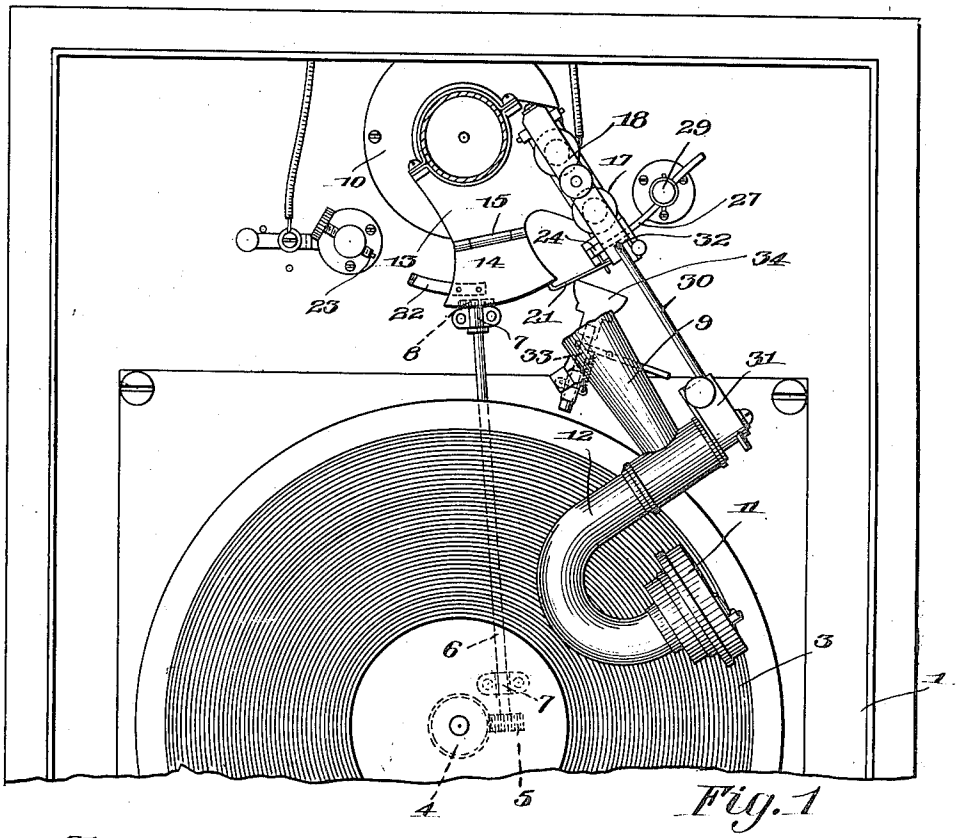

Fig. 1

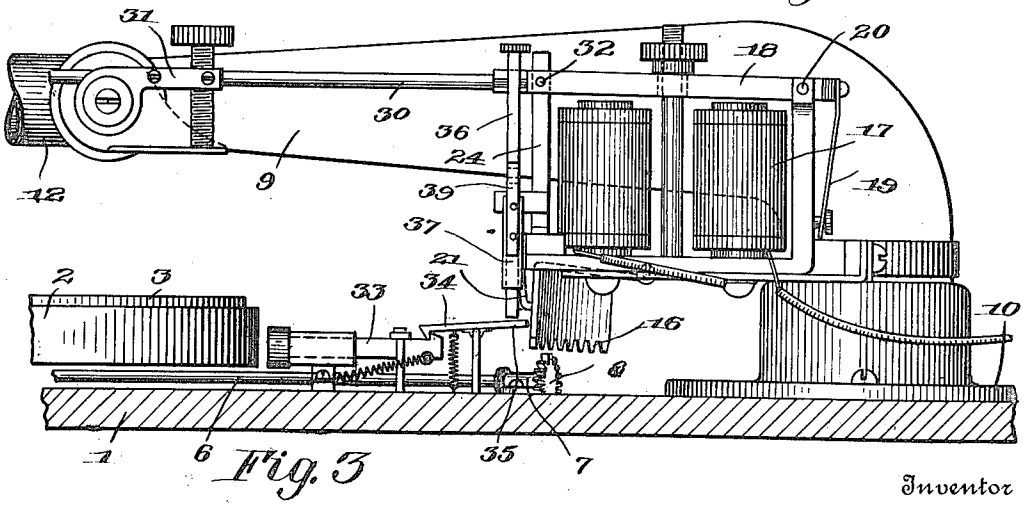

Fig. 3

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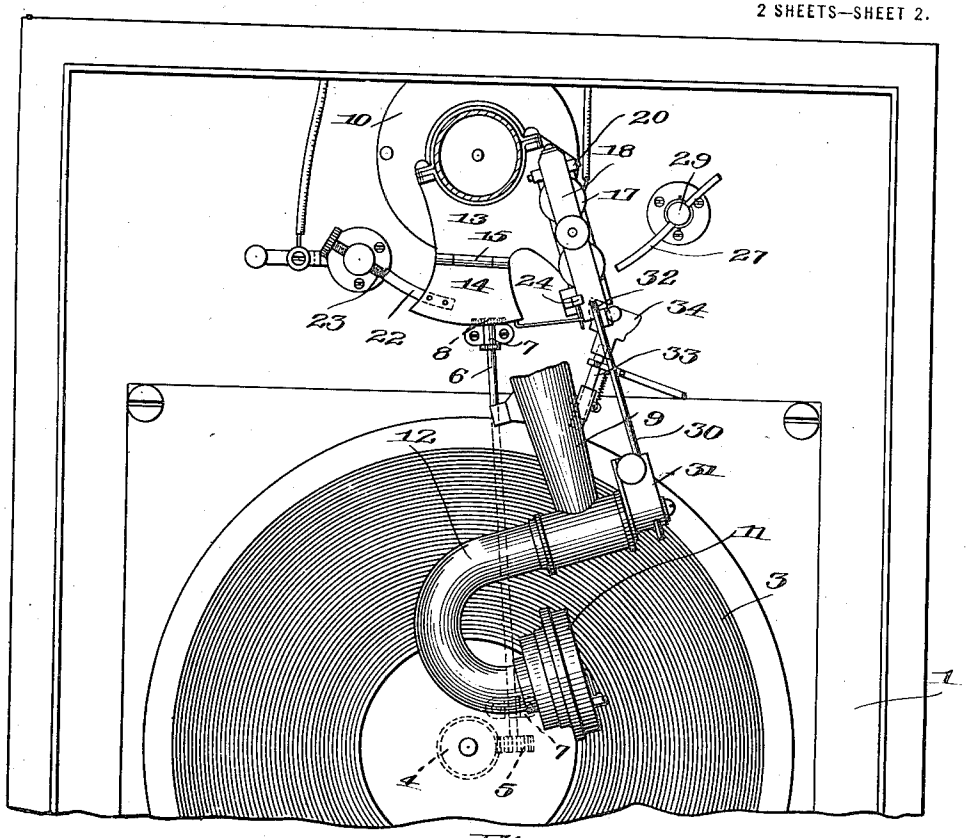
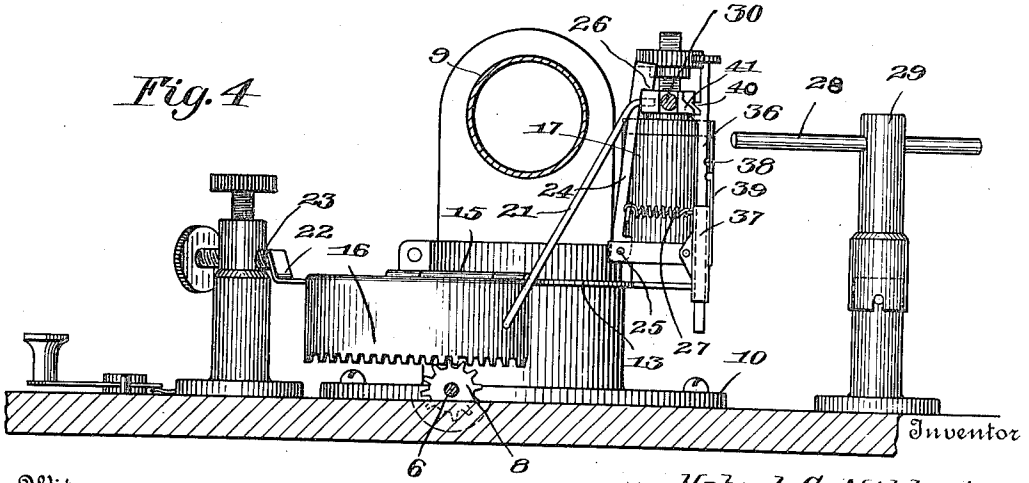


Fig. 2

Fig. 4



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UNITED STATES PATENT OFFICE.

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SOUND-REPRODUCING MACHINE.

1,282,916. Specification of Letters Patent. Patented Oct. 29, 1918.

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To all whom it may concern:

Be it known that I, HOBART C. NIBLACK, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Sound-Reproducing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My invention relates to improvements in sound reproducing machines, with more particular reference to disk or flat record graphophones, and it has for its primary purpose to provide a novel construction and arrangement of parts for automatically effecting one or more repetitions of a record, and also for stopping movement of the record at the end of a plurality of complete operations. To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a plan view, showing the application of my invention to a flat record sound reproducing machine, with parts broken away, the sound box appearing at the starting point on the record;

Fig. 2 is a similar view, showing the position of the parts when the sound box is at the end of its movement on the record, and about to be lifted and carried back to its starting point;

Fig. 3 is a side elevation of the repeating mechanism, and

Fig. 4 is a vertical sectional view with parts in elevation.

Similar reference numerals throughout the several figures indicate the same parts.

In the embodiment of the invention as herein illustrated, 1 designates the base of the machine and 2 is the rotating table upon which is supported the record 3 in the usual manner. The table 2 derives its movement from the shaft 4 which may be operated from any convenient form of motor, and is provided with a worm arranged to engage a worm gear 5 on the shaft 6 which is mounted in a suitable bearings 7. The shaft 6 is provided at its opposite end with a pinion 8, being rotated continuously from the vertical shaft 4, and constitutes the driving member for the repeating mechanism, which will now be described.

The swinging supporting arm is designated at 9 and is rotatably mounted in the base plate 10, and is provided with a sound box 11 carried upon the elbow 12, which is swingingly arranged at the outer end of the supporting arm, and adapted to be raised or lowered to bring the needle into and out of contact with the record, in a manner which will presently be explained.

The driven member is carried by the supporting arm and adapted to be brought into engagement with the driving member, in order to impart a reverse movement to the supporting arm to bring the sound box back to the starting point on the record, and to this end there is provided a support 13, which is attached to the supporting arm in the manner shown so as to turn therewith, and has movably arranged on it a driven member, which, in the present instance, comprises a segmental gear plate 14. The gear plate 14 is pivoted at 15 to the support, and is provided with a toothed edge 16 which, when in lowered position, engages the aforementioned pinion 8. Also mounted on the support 13 is an electromagnet 17 embodying an armature 18, which is held in its normal elevated position as shown in Fig. 3, by means of a spring 19 attached to the outer end of the armature, the latter being pivoted at 20. The armature 18 is connected by means of a rod 21 with the gear plate 14, so that when the armature is attracted by the energization of the coils of the electromagnet, the gear plate 14 will be lowered into engagement with the pinion 8, and vice versa, when the armature is released. The electromagnet referred to is included in a suitable circuit with a battery, not shown, and is adapted to be energized when the needle reaches the end of its path of movement on the record. To this end, the gear plate 14 is provided with a contact 22 which coöperates with a stationary contact 23 to close said circuit. The parts are so related that the contact members 22 and 23 will be in engagement with each other when the supporting arm has completed its travel once across the record. The circuit is then closed, and the gear plate drops into engagement with the driving pinion, which is rotating continuously, the supporting arm being carried thereby back to the starting point upon the record for another operation. To ac-

complish this, it is necessary that the armature of the electromagnet be held down until the supporting arm is returned to its initial position, and for this purpose I provide a locking device, preferably in the form of a lever 24 pivoted at 25 and having a shouldered portion 26 which engages the armature when the latter is attracted by the coils. 27 is a spring which actuates the lever 24 to hold the latter in locking engagement with the armature. The locking device is removed from engagement with the armature, at the instant when the supporting arm reaches its initial position, by means of a stationary abutment or rod 28, mounted in a post 29, and which serves to move the locking lever laterally, against the action of the spring 27. This permits the armature to be raised by its controlling spring, and carries the gear plate 14 upwardly out of engagement with the driving pinion.

It is necessary that the sound box be lifted out of engagement with the record when the supporting arm is being moved across the record from its finishing point to its starting point, and to this end, there is provided a connection between the sound box and the armature of the electromagnet. In the present embodiment, this comprises a rod 30 which is secured in a bracket 31 mounted upon the elbow that carries the sound box, and is pivoted to the armature at 32. By this arrangement, it will be seen that when the armature is lowered into engagement with the coils of the electromagnet, the sound box will be raised out of engagement with the record, being held in such raised position until the armature is again released when the supporting arm reaches its initial position.

It is desirable that the movement of the rotating table which supports the record, be stopped automatically after the supporting arm has made a predetermined number of complete operations, and, in the present embodiment, I have shown an automatic stop mechanism which will be operated after one repetition of the record to stop its movement. To this end, I provide a spring actuated brake 33 arranged to engage the edge of the rotating table, and normally held out of engagement therewith by a pivoted locking arm 34 which carries a tail piece 35 that is adapted to be depressed automatically to release the brake. To effect the movement of the lever 34, there is provided a plunger 36 which is slidable in the sleeve 37 and is provided with a plurality of notches 38 arranged to be engaged by a spring controlled latch 39. On its opposite side, the plunger 36 carries a plurality of beveled teeth 40, corresponding in number to the notches 38 and arranged to be engaged by a shoulder 41 on the armature 18. At each operation of the armature, its movement is sufficient to lower the plunger the distance between the notches 38, said plunger being held in such position by means of the spring latch 39. The shoulder 41 on the armature is permitted to pass the teeth 40 by reason of the pivotal mounting of the sleeve 37, which permits a slight movement of the teeth 40 laterally of the armature. The sleeve is held in normal position by means of the spring 27. In the present embodiment, the parts are so constructed and arranged that two operations of the plunger 36 are necessary before its lower end will engage the lever 34. After the supporting arm has traveled once across the record, the operation of the electromagnet will lower the plunger 36 the distance between the notches 38, the lower end of said plunger being still slightly above the tail piece 35 of the lever 34, but after one repetition of the record, upon the second operation of the electromagnet, the plunger will engage the lever 34, releasing the brake, and bringing the table to a standstill. Obviously, this construction may be modified, so as to permit any desired number of repetitions, although in most cases, more than two operations are not required.

While I have shown a more or less specific embodiment of the invention, it is to be understood that I am not limited to the exact details of construction set forth, but intend to cover by this application any different arrangements that may come within the scope of the invention, and the terms of the claims hereinafter.

I claim as my invention:

1. In a repeating mechanism for sound reproducing machines, the combination with a supporting arm, of a driving member, a driven member carried by the supporting arm and movable thereon into and out of engagement with the driving member, and electrically controlled devices for effecting movement of the driven member into engagement with the driving member.

2. In a repeating mechanism for sound reproducing mechanisms, the combination with a supporting arm, of a driving member, connecting means between the driving member and the supporting arm carried by the supporting arm and movable thereon into and out of engagement with the driving member, and electrically controlled instrumentalities operating to move said connecting means into operative relation with the driving member.

3. In a repeating mechanism for sound reproducing machines, the combination with a supporting arm having a gear member arranged thereon and movable relatively thereto, of a rotatable pinion, and electrically controlled devices for moving said gear member into engagement with the pinion.

4. In a repeating mechanism for sound reproducing machines, the combination with

a supporting arm having a gear plate pivotally mounted thereon, of a rotatable pinion, and automatically operated devices for moving said gear plate into and out of engagement with the pinion.

5. In a repeating mechanism for sound reproducing machines, the combination with a supporting arm, of a gear plate pivotally arranged on the supporting arm, an electromagnet carried by the supporting arm and having its armature connected to said gear plate, a circuit including said electromagnet, a stationary contact, and a contact on the gear plate, a locking device for holding said armature, a stationary abutment arranged to engage the locking device, and a rotatable driving member adapted to be engaged by the gear plate.

6. In a sound reproducing machine, the combination with a supporting arm having a driven member movably arranged thereon, a rotatable table, a driving member, a brake coöperating with the table, and automatically controlled means for effecting engagement and disengagement of the driven member with the driving member, and for releasing the brake after one complete operation of the driven member by the driving member.

7. In a sound reproducing machine, the combination with a supporting arm having a driven member movably arranged thereon, a rotatable table, a driving member, a brake coöperating with the table, and electrically controlled means for effecting engagement of the driven member with the driving member, and for releasing the brake after one complete operation of the driven member by the driving member.

8. In a sound reproducing machine, the combination with a movable supporting arm, of a record support, a brake arranged for coöperation with the support and automatically movable into engagement with the record support when released, locking means acting to hold the brake out of engagement with the record support, automatic devices operating to return the supporting arm to its initial position, and a releasing member movable intermittently after each return of the supporting arm to initial position and operating to release the locking means after a predetermined number of operations.

9. In a sound reproducing machine, the combination with a movable supporting arm, of a record support, a brake arranged for coöperation with the support and automatically movable into engagement with the record support when released, locking means acting to hold the brake out of engagement with the record support, automatic devices operating to return the supporting arm to its initial position, and a releasing member actuated upon the return of the supporting arm to its initial position and coöperating with the locking means after a predetermined number of operations of the supporting arm to release the brake and permit its engagement with the record support.

10. In a sound reproducing machine, the combination with a movable supporting arm, of a record support, a brake arranged for coöperation with the support, being automatically movable into engagement with the record support when released, and normally held out of engagement therewith, automatic devices operating to return the supporting arm to its initial position, and means controlled upon return of the supporting arm to initial position after a predetermined number of operations for permitting engagement of the brake with the record support.

11. The combination with a phonograph repeating attachment having a movable member, of a brake for stopping the phonograph, means interposed in the path of the brake to prevent it from acting, and mechanism actuated by said movable member of the repeating mechanism for releasing said brake from restraint at the end of any desired number of the actuations of the said repeating mechanism.

12. The combination with a repeating mechanism for phonographs, of a spring actuated brake for stopping the phonograph, means restraining the brake from acting, and mechanism by which the brake will be freed from restraint at the end of either of several actuations of said repeating mechanism.

13. In combination with a phonograph having a turntable and a tone arm, of a repeating and stopping attachment, comprising a spring actuated brake and means for returning the tone arm to starting position a predetermined number of times and for then permitting the brake to be actuated to stop the turntable.

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Witnesses:
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