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TURNTABLE DRIVE

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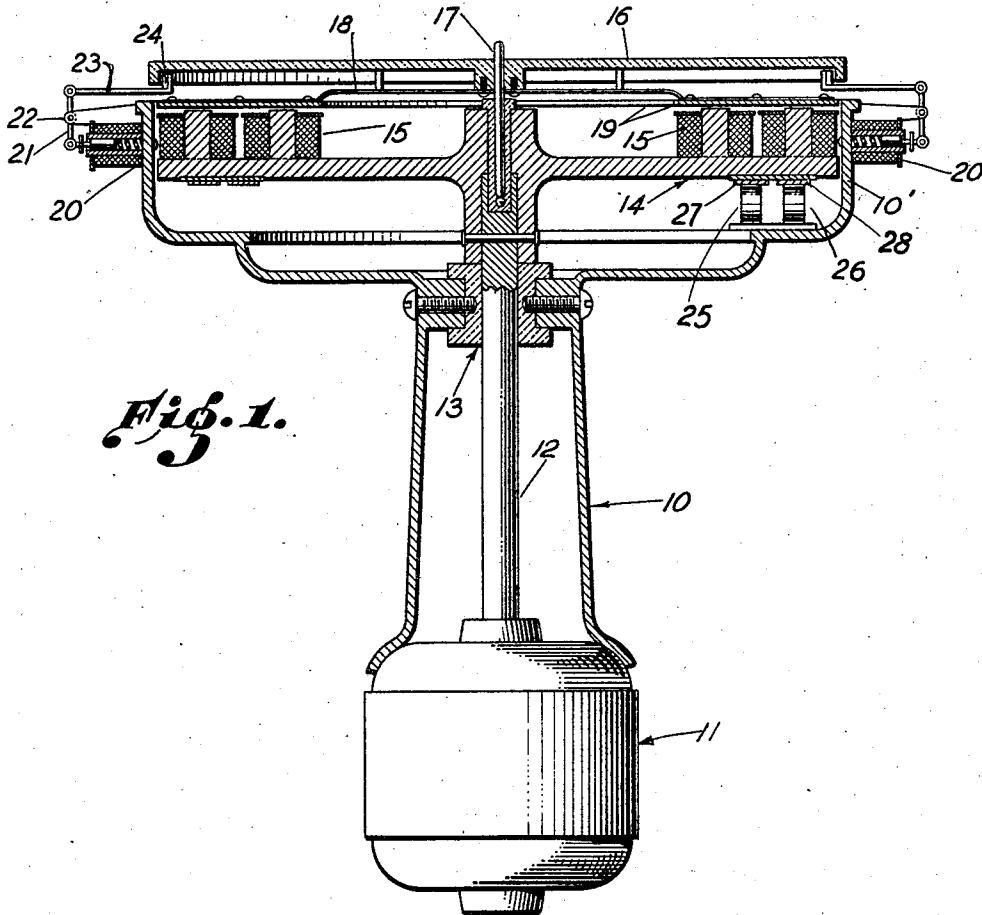


Fig. 1.

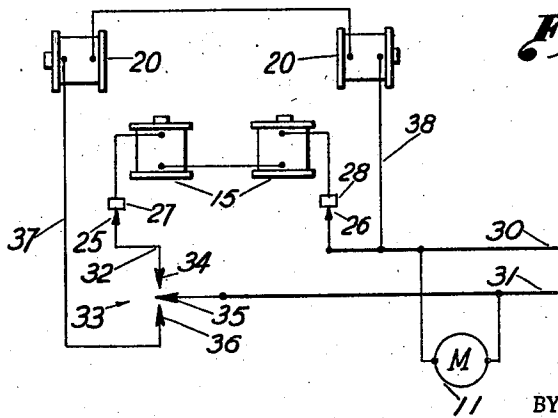


Fig. 2.

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TURNTABLE DRIVE

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3 Claims. (Cl. 192—9)

This invention pertains to improvements in turn-tables adapted for use in recording and reproducing machines or in other devices wherein it is desired to rapidly and positively start and stop a rotatable member such as a turn-table.

The device of the present invention has a large number of uses which will occur to those skilled in the arts. An example of one use shall be given. During the presentation of plays, particularly during broadcasting, it is highly desirable to introduce various sound effects at appropriate moments. Very often such effects are gathered from separate phonographs or phonographic recordings. Attempts have been made to place all sound effects which are to be used during the presentation of a play upon a single record but difficulties are encountered in starting and stopping the turn-table with sufficient rapidity. If the turn-table is permitted to rotate continuously during the entire presentation of the play, then a single record can not carry all of the desired sound effects and the silent groove noise may be sufficient to disturb the actors and make itself audible to the audience. It is therefore highly desirable to have a single record bearing the various sound effects, such sound effects being separated by only a very short length of silent groove and that means be provided whereby the record may be brought up to proper reproducing speed instantaneously and stop instantaneously. This can be accomplished by the device of this invention.

An object of the present invention, therefore, is to disclose and provide means for controlling the operation of a turn-table.

A further object is to disclose and provide a turn-table construction and drive whereby the turn-table may be brought up to speed practically instantaneously.

A further object is to disclose and provide a turn-table drive and system whereby the turn-table may be started or stopped quickly and positively.

A still further object is to provide electromagnetic means for controlling the rotation of a rotatable member such as a turn-table.

These and other objects of the invention will become apparent to those skilled in the art from the following description, reference being had to the appended drawing, in which:

Fig. 1 is a vertical section of one form of device embodying the elements of the invention.

Fig. 2 is a wiring diagram for use in the device shown in Fig. 1.

As shown in Fig. 1, the device may comprise any suitable frame, support or base 10 contain-

ing a motor 11 carried or coupled to a drive shaft 12 journaled within the standard by a bearing 13. The drive shaft 12 is directly connected to a rigid circular member 14 which may be in the form of a spider or disc. A disc-shaped member 14 is shown in the drawing, the upper surface of such disc carrying electromagnetic coils 15 circularly arranged on the disc. These coils may be termed "clutch coils."

The device is provided with a freely revolvable floating turn-table 16 which, in this particular form of the invention, is mounted on a spindle 17, said spindle being freely journaled in the shaft 12 and member 14.

An armature plate or plates 19 is suspended immediately above the electromagnetic coils 15. The armature plate 19 may be in the form of an annular ring and may be attached to the turn-table 16 by means of a resilient member 18. The member 18 may be in the form of a very thin, relatively flexible and resilient disc or it may be in the form of a spider provided with resilient spring-like arms. This construction should permit the armature plate 19 to move vertically into and out of contact with the electromagnetic coils and particularly with the cores thereof.

The base or support 10 is preferably provided with an enlarged upper portion 10' adapted to form a housing for the member 14. Mounted upon the outer periphery of said housing is a plurality of solenoids or electromagnetic coils 20, each of these being adapted to actuate a linkage including a lever 21 pivoted at 22, said lever being operably connected as by link 23 to a brake shoe 24. These brake shoes 24 are adapted to act upon the inner surface of a downwardly extending lip formed in the turn-table 16.

Current is supplied to the coils 15 carried by the rotatable member 14 by means of suitable brushes 25 and 26 cooperating with the commutator rings 27 and 28 carried by the lower surface of the member 14.

By referring to Fig. 2, it will be seen that current from supply lines 30 and 31 is supplied directly to the motor 11 and the line 30 is connected to the brush contact 26 which cooperates with commutator 28 and thereby supplies energy to the clutch coils 15. The return line includes the commutator ring 27, brush 25 and the line 32 leading to terminal 34 of a double throw switch, generally indicated at 33. The switch arm 35 connected to line 31 may close the circuit with terminal 34 or with terminal 36 of the double throw switch 33. Terminal 36 is connected by line 37 with the brake coils 20, the

return line being indicated at 38 and connecting such coils with the line 30.

It will be noted, therefore, that the switch 33 is designed to energize either coils 15 or the brake coils 20 and both the clutch coils and the brake coils can not be energized at the same time.

In actual operation, the rotatable member 14 is continuously driven by the motor 11. This member 14 is preferably made relatively heavy so as to have a high moment or inertia. The turn-table 16, on the other hand, is made of light material so as to have a very low moment of inertia. Ordinarily, the circuit through the brake coils 20 may be closed by the double throw switch 33 so as to make certain that the turn-table does not revolve. If, however, such switch 33 is actuated so as to close the circuit leading to the clutch coils 15, the coils 15 are energized and draw the armature 19 into firm contact with the cores of the electromagnets, thereby coupling the turn-table 16 to the rotating member 14. The rotational speed of the member 14 is thus instantaneously transmitted to the turn-table 16 and reproduction of the record may take place immediately without distortion of the sound recorded upon the record carried by the turn-table. When it is desired to stop the turn-table, the switch 33 is actuated so as to open the circuit to the clutch coils 15 and to close the circuit to the brake coils 20. These brake coils are thus immediately energized and operate the linkage including elements 21 and 23, pressing the brake shoes 24 against the rim of the turn-table and immediately stopping the turn-table.

Since the clutch coils 15 are deenergized, the armature 19 is liberated from contact with the cores of the electromagnets by reason of the spring suspension 18 so that the turn-table becomes freely floating at the instant that the brake coils 20 are energized.

Although one particular embodiment of the invention has been described, it will be evident to those skilled in the art that numerous changes could be made in the form of the device, in the number of coils employed, the form of the rotatable member 14, etc. All changes and modifications coming within the scope of the appended claims are embraced thereby.

I claim:

1. In a turn-table for recording and reproducing devices and the like, the combination of: a supporting base, a vertical drive shaft journaled in said base, means for continuously driving said shaft, a rigid circular member mounted on said shaft for rotation therewith, a freely revolvable floating turn-table above said mem-

ber and concentric therewith, electromagnetic coils carried by said member; an armature plate resiliently attached to said turn-table, said plate being out of contact with said coils when said coils are deenergized and adapted to contact said coils when said coils are energized; stationary brake coils attached to the supporting base, brake shoes in operative relation to said turn-table, means connecting said brake coils and brake shoes; and a circuit including a source of energy and a double throw switch whereby said brake coils are deenergized when said electro-magnetic coils are energized, and the latter are deenergized before the brake coils are energized.

2. In a turn-table for recording and reproducing devices and the like, the combination of: a supporting base, a vertical drive shaft journaled in said base, means for continuously driving said shaft, a rigid circular member mounted on said shaft for rotation therewith, said member having a relatively high moment of inertia, a freely revolvable floating turn-table above said member and concentric therewith, said turn-table having a low moment of inertia, electromagnetic coils carried by said member; an armature plate resiliently attached to said turn-table, said plate being out of contact with said coils when said coils are deenergized and adapted to contact said coils when said coils are energized; stationary brake coils attached to the supporting base, brake shoes in operative relation to said turn-table, means connecting said brake coils and brake shoes; and a circuit including a source of energy and a double throw switch whereby said brake coils are deenergized when said electromagnetic coils are energized, and the latter are deenergized before the brake coils are energized.

3. In a device of the character described, the combination of: a supporting base, a vertical drive shaft journaled in said base, means for continuously driving said shaft, a rigid circular member mounted on said shaft for rotation therewith, a freely revolvable floating turn-table above said member and concentric therewith, electromagnetic coils carried by said member, means for supplying electrical energy to said coils; an armature plate resiliently attached to said turn-table and in operative relation to said electromagnetic coils; electromagnetic brake means in operable relation to said turn-table; and a circuit including a source of energy and a double throw switch whereby said brake means are deenergized when said coils are energized and the latter are deenergized before the brake means are energized.

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