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CONTROL DEVICE FOR PHONOGRAPHS

Filed March 13, 1931

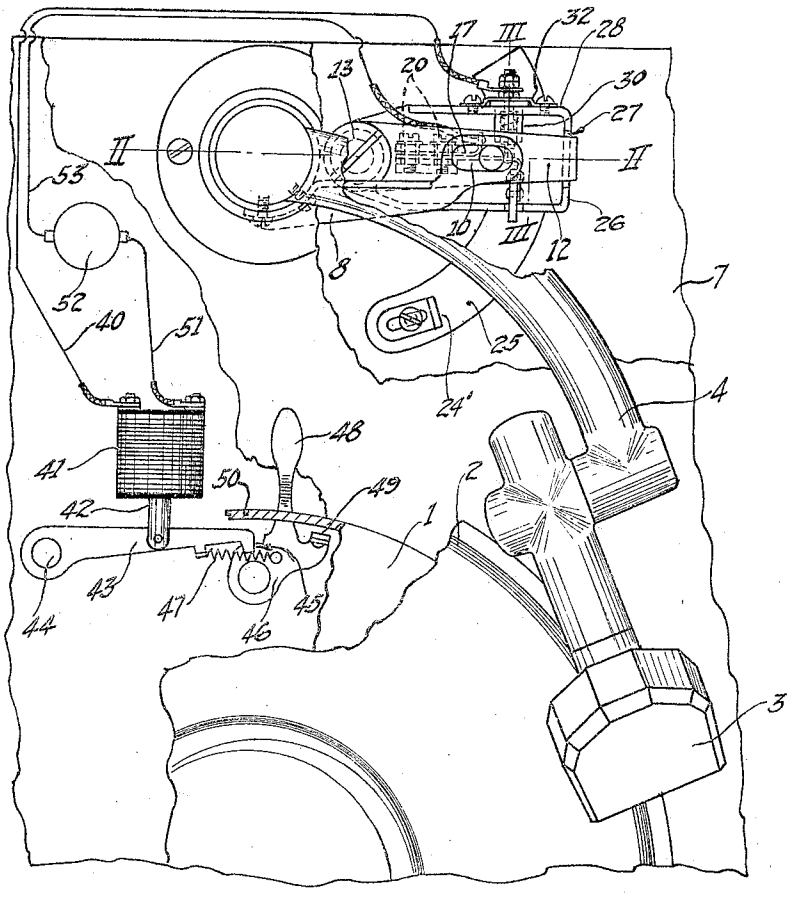


Fig 1

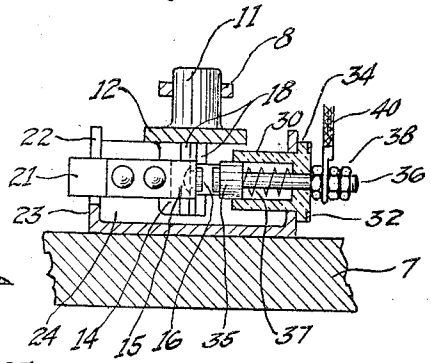


Fig 3

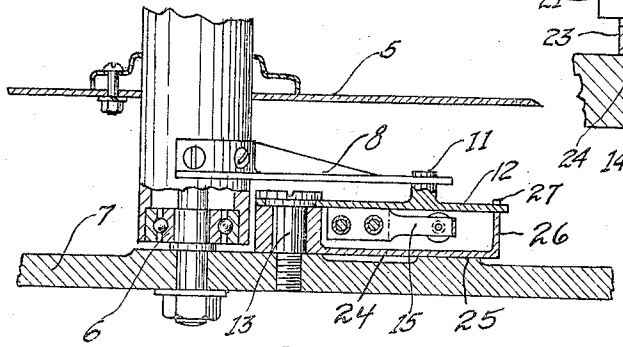


Fig 2

Inventor
Martin Nystrom
By W. W. Beatty
Atty.

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UNITED STATES PATENT OFFICE

MARTIN NYSTROM, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNITED RESEARCH CORPORATION, A CORPORATION OF DELAWARE

CONTROL DEVICE FOR PHONOGRAPHS

Application filed March 13, 1931. Serial No. 522,481.

My invention relates to phonographs and has particular relation to control mechanisms automatically operable after the playing of a record for actuating automatic stops or the like purposes. It is in the nature of an improvement in a control mechanism, which is the subject of my copending application, Serial No. 469,488, filed July 21, 1930, for a phonograph.

For stopping the turntable of a phonograph after the playing of a record or for automatically initiating the movement of parts for playing another record as in so-called "automatic" phonographs, two types of control mechanism are in general use; one is operative on the progression of the suspension arm to a fixed point and the other on the reverse movement of the suspension arm.

The control mechanism of my invention may be used for the purposes referred to, and an object thereof is to provide a device whereby a single pair of contacts constituting a switch may be automatically engaged after the playing of a record either by the progression of the suspension arm to a predetermined point or by its reversal of movement.

Another object of my invention is to provide control mechanism comprising a pair of contacts which are engageable by reverse movement of the suspension arm or its forward movement to a predetermined point and which have yieldable mountings to permit further forward movement of the arm beyond the predetermined point after engagement of the contacts, thus permitting the stylus to continue following the groove on the record.

Other objects will appear as the description proceeds.

Referring to the accompanying drawing, Fig. 1 is a plan view of a portion of a phonograph embodying my invention, parts being broken away to show mechanism beneath, and Figs. 2 and 3 are sectional views on the lines II—II and III—III respectively of Fig. 1, Fig. 3 being on an enlarged scale.

Referring more particularly to the drawing, a turntable 1 is provided on which a record 2 is positioned, to be played by means of a pickup 3 on a suspension arm 4.

The suspension arm extends through a hole in a motor plate 5 and is mounted to turn on bearings 6 on a bed 7. An arm 8 secured to the suspension arm has a slot 10 therein, which receives a stud 11 on a lever 12. The lever has a pivot 13 and is provided with a depending lug 14, which supports a spring 15 carrying a contact 16. The spring and a conductor strip 17 are held between pieces of insulation 18 through which screws 20 are directed into the lug 14.

Beyond the contact 16 the spring is bent and a piece of insulation 21 is secured thereto and extends through a recess 22 in the wall 23 of a switch box 24 and is engageable with a stop 24′ adjustably mounted on the bed 7.

The switch box 24 which is also mounted on the pivot 13 is slideable on a raised surface 25 on the bed 7, and its side wall 26 is provided with an opening 27 which receives the end of the lever 12.

Another wall 28 of the switch box has a hole therein into which fits a bushing 30 of suitable insulating material. The outer end of the bushing extends through an aperture in a keeper 32, a collar 34 on the bushing being held between the keeper and the wall 28 of the switch box.

A contact 35 has a stem 36 which extends through the bushing and is surrounded by a compression spring 37. Nuts 38 on the stem limit the movement of the contact under the action of the spring and secure it to a conductor 40.

A solenoid 41 to which the conductor is connected is mounted on the bed 7 has a core 42, which is pivoted on a trigger 43. The trigger 43 is mounted on a pivot 44 and its free end is received in a notch 45 in a lever 46, which is connected to the trigger by a spring 47. The lever has a handle 48 and is provided with a brake pad 49 which is engageable with a flange 50 on the turntable 1.

A conductor 51 extends from the solenoid to a source of direct current 52 which is connected by a conductor 53 to the conductor strip 17.

The contacts 16 and 35 constitute a switch for closing the circuit of the solenoid 41.

In the operation of the device the inward movement of the suspension arm over the record is communicated by the arm 8 to the lever 12, which in turn moves the switch box 24. After the playing of records of a certain type of manufacture the suspension arm is given a reverse motion by what is called an "eccentric groove". The reverse motion of the suspension arm is communicated to the lever 12, but the friction between the surface 25 and the switch box is sufficient to hold the latter in position till the contact 16 engages the contact 35, the opening 27 being wide enough to permit such motion.

The engagement of the contacts closes the circuit of the solenoid 41, which then retracts the core 42 and withdraws the end of the trigger 43 from the notch 45 in the lever 46. This permits the spring 47 to cause the engagement of the brake pad 49 with the flange 50 of the turntable.

After the turntable stops the pickup 3 may be moved outwardly by an operator and another record placed on the turntable. The pickup may then be swung inwardly separating the contacts 16 and 35 and applied to the record, and the operator may push the handle 48 to release the brake pad 49 and restore the trigger 43 to the position shown in Fig. 1.

In playing a record not provided with an eccentric groove the stylus continues to feed in after the record is played and the piece of insulation 21 is thus brought into engagement with the stop 24'. This arrests the movement of the contact 16, but the suspension arm continues to move in and the continued movement of the lever 12 and the switch box 24 causes the contact 35 to engage the contact 16, thus closing the circuit of the solenoid 41 and braking the turntable as previously described. In the continued inward movement of the suspension arm after the engagement of the piece of insulation 21 with the stop 24' there is no tendency for the stylus to "jump out of" the groove in the record, as the spring 15 is of a sufficiently yieldable character to permit the stylus to follow the groove. The spring 37 is also sufficiently yieldable to prevent any tendency of the stylus to "jump" on the engagement of the contacts 16 and 35.

Although I have illustrated and described my control device as associated with a brake, it may be used for other purposes in a phonograph. In Patent No. 1,448,733 to Dickinson, granted March 1, 1923, for a multiple record magazine phonograph, contacts are closed after the playing of a record for initiating the operation of the mechanism for discharging the played record and beginning the playing of a succeeding record. My control device may be substituted for such contacts as are described in this patent.

My invention is not limited to the specific details of construction illustrated and described, which may be extensively modified without departing from the spirit of the invention, and a substantial range of equivalents is contemplated within the scope of the appended claims.

I claim as my invention:

1. In a control device for a phonograph, the combination of a suspension arm, a pair of contacts constituting a switch, means supporting said contacts for movement in the same direction and also for movement relative to each other, said means being adapted to permit said contacts to remain in the positions into which they move, and means operative on the reverse movement of said suspension arm or on its forward movement to a predetermined point to engage said contacts and thus close said switch.

2. In a control device for a phonograph, the combination of a suspension arm, a pair of contacts constituting a switch, yieldable mountings for said contacts, and means operative on the reverse movement of said suspension arm or on its forward movement to a predetermined point to engage said contacts, said yieldable mountings permitting further continued movement of said suspension arm after engagement of said contacts.

3. In a control device for a phonograph, the combination of a pivoted suspension arm, means operable on the reverse movement of said suspension arm for closing an electric circuit, a stop, and means including a yieldable member engageable with said stop operative on the forward movement of said suspension arm for closing the electric circuit, the yieldable character of said member permitting further movement of said suspension arm after the closing of the circuit.

4. In a control device for a phonograph, the combination of a pivoted suspension arm, a contact, means connected to said suspension arm for moving said contact therewith continuously during the playing of a record, a second contact, means for conveying said second contact a short distance from the first mentioned contact, said contacts constituting a switch, said means cooperating on the reverse movement of said suspension arm to cause said first mentioned contact to engage said second, thus closing the switch, means operative on the continued forward movement of said suspension arm to arrest said first mentioned contact at a predetermined point and cause said second contact to engage it, and a yieldable mounting for said second contact to permit said suspension arm to continue forwardly after said second contact engages the first mentioned contact.

5. In a control device for a phonograph, the combination of a pivoted suspension arm,

a contact, means connected to said suspension arm for moving said contact therewith continuously during the playing of a record, a second contact, means for conveying said second contact a short distance from the first mentioned contact, said contacts constituting a switch, said means cooperating on the reverse movement of said suspension arm to cause said first mentioned contact to engage said second contact, thus closing the switch, means operative on the continued forward movement of said suspension arm to arrest said first mentioned contact at a predetermined point and cause said second contact to engage it, and a yieldable mounting for said second contact to permit said suspension arm to continue forwardly after said second contact engages said first mentioned contact.

6. In a control device for a phonograph, the combination of a pivoted suspension arm, a contact, means connected to said suspension arm including a yieldable mounting for said contact for moving it continuously during the playing of a record, a second contact, means including a yieldable mounting for said second contact for conveying said second contact a short distance from the first mentioned contact, said contacts constituting a switch, said means cooperating on the reverse movement of said suspension arm to cause said first mentioned contact to engage said second, thus closing said switch, and means operative on the continued forward movement of said suspension arm to arrest said first mentioned contact at a fixed point and cause said second contact to engage it, said yieldable mountings for said contacts permitting further continued movement of said suspension arm after the engagement of said contacts on the forward or rearward movement of said suspension arm.

7. In a control device for a phonograph, the combination of a pivoted suspension arm, a member connected to said arm to move in unison therewith, a contact, a yieldable mounting for said contact on said member, a second contact, said contacts constituting a switch, a second member supporting said second contact, said members being connected together by a slight lost motion connection, to permit said contacts to engage on reverse movement of said tone arm and to separate on forward movement thereof, a stop for arresting the forward movement of the first mentioned contact whereby on the continued forward movement of said tone arm and said member said second contact is brought into engagement with said first mentioned contact.

8. In a control device for a phonograph, the combination of a pivoted suspension arm, a member connected to said arm to move in unison therewith, a contact, a yieldable mounting for said contact on said member, a second member connected to said first member by a slight lost motion connection, a second contact, a yieldable mounting for said second contact on said second member, said lost motion connection permitting said contacts to engage on reverse movement of said suspension arm and to separate on forward movement thereof, said contacts constituting a switch, a stop, and an additional member connected to the first mentioned contact and engageable with said stop to arrest the movement of said first mentioned contact during the forward movement of said suspension arm, whereby said second contact is brought into engagement with said first contact, said yieldable mountings for said contacts permitting further forward movement of said suspension arm after engagement of said contacts.

9. In a control device for a phonograph, the combination of a pivoted suspension arm, a lever, means connecting said suspension arm to said lever for movement in unison therewith, a contact yieldably mounted on said lever, a second lever, a second contact carried thereby, said levers having a lost motion connection permitting said contacts to engage on the reverse movement of said suspension arm and to separate on the forward movement thereof, a stop and a member engageable with said stop for arresting the forward movement of the first mentioned contact whereby the second contact is brought into engagement therewith, said contacts constituting a switch.

10. In a control device for a phonograph, the combination of a pivoted suspension arm, a contact, means for moving said contact in unison with said suspension arm, a slidable member, a second contact mounted on said member, means for frictionally opposing the motion of said member, and means for positively moving said member in unison with said suspension arm so that said second contact is caused to follow the first mentioned one at a predetermined distance, said means having a lost motion connection with said member to permit said first mentioned contact to engage said second on the reversal of movement of said suspension arm.

MARTIN NYSTROM.