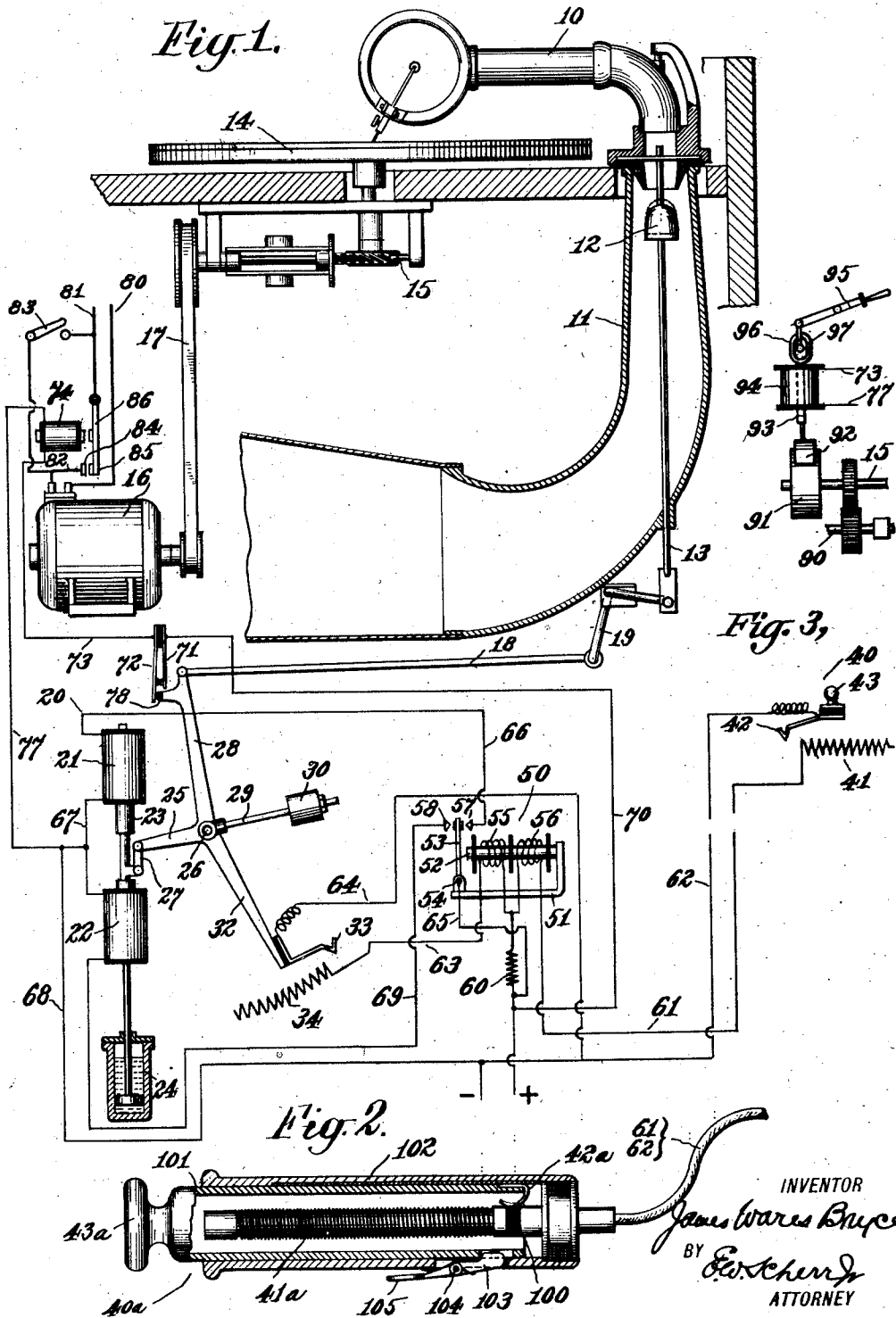


J. W. BRYCE.
 REMOTE CONTROL FOR PHONOGRAPHS AND THE LIKE.
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1,279,245.

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INVENTOR
 James Wares Bryce
 BY *E. J. Schenck*
 ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES WARES BRYCE, OF BLOOMFIELD, NEW JERSEY, ASSIGNOR TO THE AEOLIAN COMPANY, A CORPORATION OF CONNECTICUT.

REMOTE CONTROL FOR PHONOGRAPHS AND THE LIKE.

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Specification of Letters Patent. Patented Sept. 17, 1918.

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to all whom it may concern:

Be it known that I, JAMES WARES BRYCE, a citizen of the United States of America, and a resident of Bloomfield, Essex county, and State of New Jersey, have invented certain new and useful Improvements in Remote Controls for Phonographs and the like, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

My invention relates to improvements in remote control for phonographs or other motor driven musical instruments, and more specifically for electrically actuated means for controlling the driving motors and expression devices for such instruments, such, for example, as a valve for varying the volume of sound produced by a phonograph.

Its object is to provide a simple, efficient and sensitive electro-responsive actuating mechanism for starting the driving motor of a phonograph and for actuating an expression device therefor, with a manually operable remote control device by means of which a person at any desired distance from such an instrument may start and stop the instrument and may also control the expression device therefor, at will.

In order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification, and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a side elevation partly in section, of certain parts of a phonograph or the like, with its driving motor and with actuating and control devices embodying my invention applied thereto, the latter being shown diagrammatically.

Fig. 2 is a sectional elevation of a preferred form of a manual control device.

Fig. 3 is an elevation of certain parts of a phonograph driven by a spring motor with certain parts of the present invention applied thereto, this figure showing certain modifications in construction which are made to adapt the invention to this type of motor drive.

Like characters of reference designate corresponding parts in all the figures.

10 designates the tone arm of the instrument to be controlled and 11 a part of its sound chamber. 12 is the expression device,

in this case a valve arranged to be moved by a rod 13 toward or away from its seat, to thereby produce more or less restriction to the size of the sound passage and to thereby vary the volume of sound emitted from the instrument.

14 is the revoluble platen upon which the sound producing records are supported and 15 is a shaft connected by suitable gearing with said platen. 16 is an electric motor connected by means of a belt 17 and suitable sheaves with the shaft 15.

An electro-responsive control motor is designated generally by the reference numeral 20. This motor comprises a pair of similar solenoids 21—22, a common core 23, and a dash pot 24 connected with the core. 25 is one arm of a bell crank lever pivoted at 26 which is connected with the core 23 by a link 27. Another arm 28 of this lever is connected with the valve rod 13 by means of a rod 18 and a small bell crank lever 19. 29 is a rod extending rigidly from the bell crank lever and carrying a weight 30 by means of which the bell crank lever and the different elements which are connected therewith may be counter-balanced to a desired extent. 32 is an arm which forms a part of the lever and this carries at its outer end an electrical contact 33 which is supported thereon but insulated from it. This contact is adapted to be moved onto and to slide over and make electrical connection with various points on rheostat 34 as the position of the bell crank lever 25 is changed.

40 is a manually operable current varying or control device which comprises a rheostat 41 similar in resistance to the resistance 34, a movable contact 42 which is adapted to be moved onto and over various points on the rheostat 41, and a handle or knob 43.

A sensitive relay 50 is interposed between this manual control device and the electro-responsive control motor 20. This relay comprises an electro-magnet 51 of which the pole piece is designated by 52. 53 is a polarized armature pivoted at 54 to the frame of magnet 51. The relay also comprises two magnet windings 55—56 of an equal number of convolutions wound in opposite directions. 57 and 58 are stationary contacts between which is a movable contact carried by the pivoted armature 53. Plus and minus designate mains from a suitable source of

electrical supply. From the plus main a wire leads through a resistance 60 and by means of a branch wire through the magnet winding 56. 61 is a wire which leads from this magnet winding to one end of the rheostat 41. 62 is a wire connected with the movable contact 42 and with the minus main.

Another branch of the wire from the resistance 60 leads through the magnet winding 55, and 63 is a wire leading from the other side of this magnet winding to one end of rheostat 34. 64 is a wire leading from the contact 33 back to the minus main. 65 is a wire leading from plus main to the pivoted armature 53.

A wire 66 is connected with stationary contact 57 and with one end of the winding of solenoid 21. The other end of this solenoid winding is connected by wires 67 and 68 with the minus main.

69 is a wire from stationary contact 58 to one end of solenoid winding 22, the other end of which is connected through wires 67 and 68 with the minus main.

From the plus main a wire 70 is led to a spring contact 71. A similar spring contact 72 is connected by means of a wire 73 with one end of the winding of a control magnet 74, the other end of which is connected by a wire 77 with wire 68 and thus back to the negative main.

The spring contacts 71 and 72 are held apart by an insulated knob projection from the lever arm 28 when the apparatus is not in use.

The supply mains for the actuating motor 16 are designated by 80 and 81. The wire 80 is connected directly with one of the terminals of motor 16. The other terminal of the motor is connected by a wire 82 with a manually operated switch 83 by means of which the motor may be connected with the main 81. The wire 82 is also connected with a stationary contact 84. 85 is a movable contact on a pivoted arm 86 which is connected with the main 81. This arm carries the armature of magnet 74 which is so arranged that when energized it will move the arm 86 in such a manner as to close the movable contact 85 against the stationary contact 84 and thus complete the motor circuit.

Before specifically describing the structures shown in the other figures of the drawing, I will describe the operation of this device. When the manual control device 40 is in the position shown the sensitive relay 50, the control motor 20 and the valve 12, will be in the positions in which they are shown and the apparatus will be at rest,—now, when the operator moves contact 42 onto rheostat 41 the circuit is thereby established through relay winding 56. This will cause the pivoted arm 53 to be moved to the right to close a circuit through solenoid 21,

which will thereby become energized and will lift the core 23. This movement will continue only until the contact 33 has been moved onto a point on rheostat 34 corresponding with the point on rheostat 41 onto which the contact 42 has been moved. As soon as this occurs a circuit will be closed through relay winding 55 and the current through the latter will be equal and opposite to that flowing through relay magnet 56, thereby neutralizing the mechanism in magnet 51. The pivoted arm 53 will then be brought back by some suitable centralizing device (not shown) to its position between the stationary contacts 57 and 58 to break the circuit through solenoid 21 and this will cause the core 23 and the parts connected therewith to come to rest.

The effect of the first movement of the core 23 will be to move the lever arm 28 to the right and this will move the insulated knob 78 away from spring contact 72, thereby closing a circuit through control magnet 74. This, when thus energized, will close the circuit of motor 16 at the contacts 84 and 85 causing the motor to rotate and to drive the platen 14.

It is obvious that if the operator moves contact 42 off of rheostat 41 the operation just described will be reversed as this will cut off the current flowing through relay magnet 56 and because the current which still flows through relay winding 55 will cause the polarized armature 53 to move away from the pole piece 52 and to complete at 58 a circuit through solenoid winding 22. The core 23 will be pulled downwardly thereby, until the contact 33 runs off of rheostat 34, thus breaking the circuit through relay winding 55. At such a time the insulated knob 78 will be in contact with spring contacts 72 and in such a position as to break the contact between 71 and 72, thus deenergizing control magnet 74 and breaking the circuit through motor 16 between the contacts 84 and 85.

It is obvious that the motor 16 may be started or stopped at will by manipulating the switch 83 if the remote control apparatus which I have invented is not used.

Let us assume that the manually controlled contact 42 is resting upon rheostat 41 and the solenoid controlled contact 33 is on rheostat 34,—if the operator desires now to vary the position of the expression control valve 12, he may move contact 42 over rheostat 41 to include more or less of its resistance in relay winding 56 in the same manner as that already described. The solenoids 21 and 22 will cause the movable contact 33 which they control to be moved over the rheostat 34 until it includes in relay winding 55 a resistance equal in amount to that part of rheostat 41 which is in circuit with the relay winding 56. This part of

the operation is more fully described in my copending application for Patent Serial No. 138,465 filed herewith.

In the form of the invention which is illustrated in Fig. 3, the shaft 15 is shown gear connected with a shaft 90 which is arranged to be driven by a spring motor (not shown). On shaft 15 is a brake wheel 91 on which rests a brake shoe 92. This is connected with the core 93 of a solenoid 94, the windings of which are connected to the wires 73 and 77 of the circuits previously described.

It may be seen that when solenoid 94 is energized it will cause the brake shoe 92 to be lifted away from the brake wheel 91 to allow the spring motor driven shaft 90 to rotate shaft 15 and the platen 14, and that when the circuit through solenoid 94 is broken the brake shoe 92 will come down onto the brake wheel 91 to arrest rotation of these parts.

95 is a pivoted lever by means of which a pin 96 may be moved manually in a slotted yoke 97 which is connected with the solenoid core 93. These parts are provided so that the rotating mechanism may be started and stopped at will when my device is not used.

Referring now to Fig. 2, the device there- in shown is one form of a remote manual control device 40^a. In this specific instance the wires 61 and 62 are led through a flexible cable to the device. One of these is connected as shown in the diagram, Fig. 1, with the rheostat 41^a, and the other is connected with the movable contact 42^a. This rests, when the parts are in the position in which they are shown in Fig. 2, upon a collar of insulating material 100. An actuating handle 43^a is in this case the end of a plunger 101 slidable in a cylindrical casing 102 and the parts are so arranged that the contact 42^a may be moved onto the coils of rheostat 41^a and over any desired part thereof.

103 is a latch pivoted at 104 to the casing 102 and provided with a finger piece 105 by means of which it may be released. This latch is spring-pressed into the position shown and has to be released before the plunger 101 can be withdrawn from the casing 102, a sufficient amount to close the circuit between contact 42^a and the coils of the rheostat 41^a. After the catch has been thus released and the plunger drawn outwardly it will resume its initial position in which it will arrest the inward movement of plunger 101 by engaging the inner end thereof before the contact 42^a runs off of the rheostat coils 41^a. This arrangement is provided so that an operator manipulating the plunger 101 to vary the position of the control valve 12, will not inadvertently force the plunger in a sufficient amount to cause the driving motor of the phonograph

to stop, but he may of course force it in a sufficient amount to stop the motor by merely releasing the catch by pressure on the finger piece 105.

I have illustrated several modifications of certain parts of the apparatus to show that I do not limit myself to any specific form or construction, and in fact intend no limitations other than those imposed by the appended claims. While I have shown the invention as applied to the control of a phonograph, it is obvious that it is equally applicable to any motor driven sound producing instrument.

What I claim is:

1. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control motor connected with said starting and stopping means, and with said movable member, and a remote control device connected with said control motor whereby said control motor may be made to actuate said starting and stopping means and to move said expression varying member to an amount and in a direction desired.

2. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control motor connected with said starting and stopping means and with said movable member, and a remote control device electrically connected with said control motor whereby said control motor may be made to actuate said starting and stopping means and said movable member.

3. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control motor connected with said starting and stopping means and with said movable member, a remote control device electrically connected with said control motor whereby said control motor may be made to actuate said starting and stopping means and said movable member, and a two-wire circuit for said manual control device.

4. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control magnet therefor, an electric control motor connected with said magnet and with said movable member, and a remote control device connected with said control motor whereby said control motor may be made to energize and deenergize said control magnet to thereby actuate said starting and stopping means and may be made to move said expression varying member to an amount and in a direction desired.

5. In combination with a sound producing

instrument having an electric driving motor and a movable expression varying member, means for starting and stopping said driving motor comprising an electromagnetic relay, an electric control motor connected with said relay and with said movable member, and a remote control device electrically connected with said control motor whereby said control motor may be made to actuate said starting and stopping relay and said movable member.

6. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control motor connected with said starting and stopping means, and with said movable member, and a remote control device connected with said control motor whereby said control motor may be made to actuate said starting and stopping means and to move said expression varying member to an amount and in a direction desired, said remote control device having a manually movable element arranged to be moved from a stop position to a driving motor starting position and over a plurality of positions for adjusting the expression varying member.

7. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, a control motor connected with said starting and stopping means, and with said movable member, and a remote control de-

vice connected with said control motor whereby said control motor may be made to actuate said starting and stopping means and to move said expression varying member to an amount and in a direction desired, said remote control device having a manually movable element arranged to be moved from a stop position to a driving motor starting position and over a plurality of positions for adjusting the expression varying member, and a releasable latch for preventing the movement of said element from such adjusting positions to its stop position.

8. In combination with a sound producing instrument having a driving motor and a movable expression varying member, means for starting and stopping said driving motor, an electromagnetic control motor connected with said starting and stopping means and with said movable member, a remote manual control device for the control motor comprising a circuit maker and an adjustable current varying element, a sensitive relay having opposed magnet windings and motor control contacts; a motor controlled circuit maker and adjustable current varying element, said manually controlled circuit maker and current varying element being in one of the relay magnet windings and the motor controlled circuit maker and current varying element being in the other relay magnet winding.

In witness whereof I have hereunto set my hand this 20th day of December, 1916.

JAMES WARES BRYCE.