Dec. 21, 1937. A. D. BRIXEY 2,102,672

REMOTE CONTROLLED SOUND PRODUCING APPARATUS

Filed April 22, 1932 2 Sheets-Sheet 1

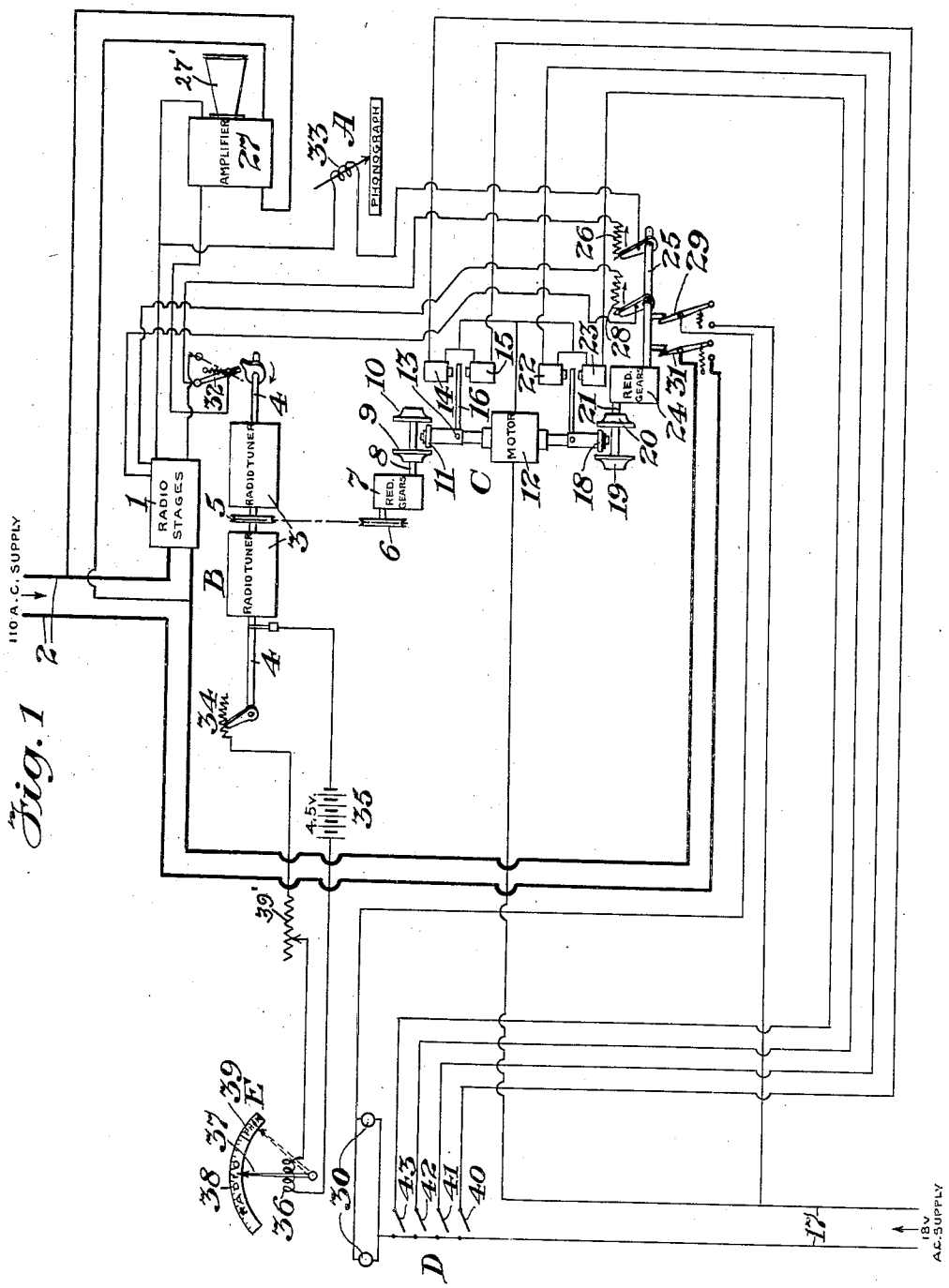


Fig. 1

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Fig. 2

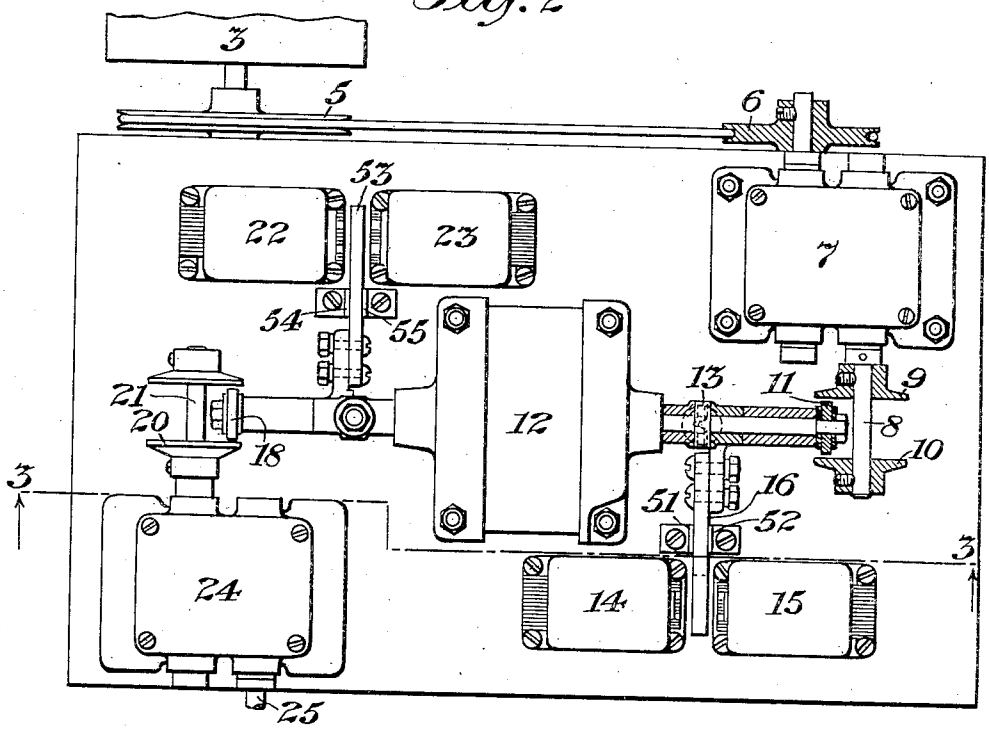
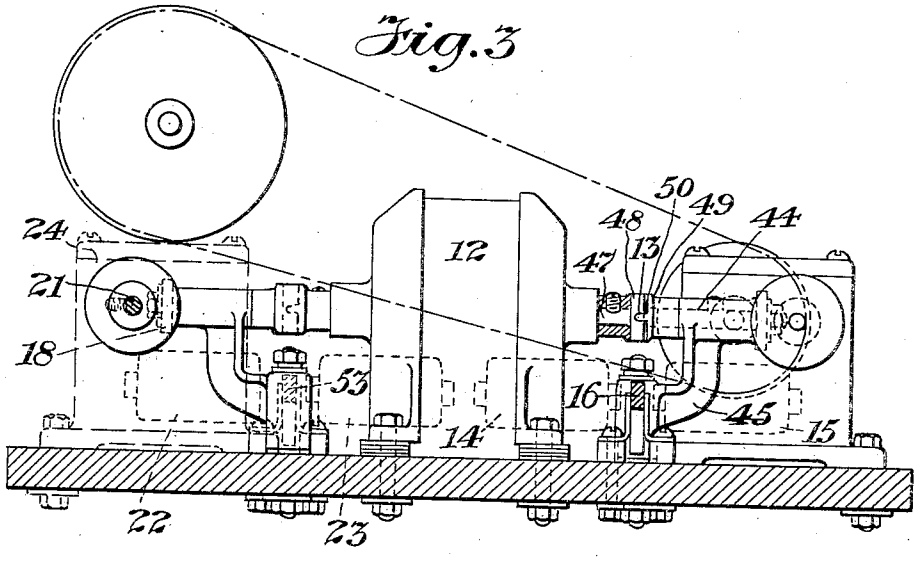


Fig. 3



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UNITED STATES PATENT OFFICE

2,102,672

REMOTE CONTROLLED SOUND PRODUCING APPARATUS

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Application April 22, 1932, Serial No. 606,799

9 Claims. (Cl. 179—100.11)

This invention relates to the control of sound producing means and especially to the control of sound production from radio receiving sets or phonographs or the two operated in conjunction.

The main object of the invention is to provide sound producing means which can be controlled from a distance.

A further object of the invention is to provide indicating means, which may be located at a distance from the sound producing means whereby the condition of the sound producing means may be indicated at the distant point.

A further object of the invention is to provide a radio set wherein the position of the tuner is shown on an indicator located at a distance from the radio set.

A further object of the invention is to control the operation of the tuning element of the radio set from a distance whereby the desired tuning of the set may be accomplished at a distance from the set.

A further object of the invention is to provide volume controlling means for a radio set, such control being exercised at a distance from the set.

A further object of the invention is to provide means for controlling from a distance the volume of sound from a phonograph.

A further object of the invention is to control a combined phonograph and radio apparatus in suitable relation, from a distance from such apparatus.

A further object of the invention is to provide an indicator at a distance from the combined radio and phonograph apparatus, which indicator is adapted to indicate the conditions with regard to the operation of the radio set and the phonograph.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawings which illustrate the invention—

Fig. 1 is a diagrammatic view of the apparatus and connections embodying the invention;

Fig. 2 is a top plan view of remotely controlled apparatus for operating the sound producing means; and

Fig. 3 is a section on the line 3—3 of Fig. 2.

Referring to the drawings, the apparatus comprises generally a phonograph A, a radio receiving set B, apparatus C for operating the tuner for the radio set and the volume controls of the radio set and phonograph, remotely located switching means D for controlling the apparatus C and an indicator E adjacent the switching apparatus D whereby the condition of the tuner at any instant may be noted, whereby proper tuning for any given transmitting set may be observed, the indicating instrument also comprising a second indicating position of the tuner shaft wherein a switch has been operated to disconnect the tuner from the loud speaker and to connect a phonograph thereto.

Referring now to the apparatus more in detail, the radio receiving set comprises any usual arrangement of appropriate vacuum tubes and circuits therefor which may be of any well known or suitable construction and arrangement indicated at 1, these circuits being fed through a suitable and well known rectifier from the 110 volt alternating current supply circuit 2. As is well known the radio circuits are appropriately tuned to the desired transmitting station by means of a "tuner" indicated at 3, usually the movable portions of condensers mounted upon a shaft as 4. The shaft may be rotated in one direction or the other by a pulley 5 belted to a pulley 6 driven through reducing gears 7 by a shaft 8 having fixed upon it the disks 9 and 10 adapted to be driven by the friction wheel 11, the shaft 8 being rotated in one direction when the wheel 11 is against the disk 10 and in the other direction when the wheel 11 is against the disk 9, the wheel 11 being driven in one direction by the electric motor 12, through a joint 13 which maintains the rotatable connection between the shaft of the motor and the wheel 11 while permitting the wheel to be shifted into and out of engagement with the disks 9 and 10. This joint is more particularly shown and will be described in connection with Figs. 2 and 3. This shifting of the wheel 11 into and out of engagement with the disks 9 and 10 is accomplished by means of electro-magnets 14 and 15. When the magnet 14 is energized the lever 16 is attracted, throwing the periphery of the wheel 11 into frictional engagement with the disk 9, and when the electro-magnet 15 is energized the arm 16 is attracted in the opposite direction so that the periphery of the wheel 11 is in frictional driving relation with the disk 10. When neither of the electro-magnets is energized the arm 16 is unattracted and the wheel 11 is not forced against either of the disks.

The motor 12 is driven from the 18 volt alternating supply mains 17. The motor also drives the wheel 18 similar to the wheel 11, and similarly having its periphery movable into and out of frictional engagement with the disks 19 and 20 fixed upon the shaft 21, by the selective energization of the electro-magnets 22 and 23, energization of the electro-magnet 22 causing driving engagement of periphery of the wheel 18 with the disk 20, energization of the electro-magnet 23 causing such engagement with the disk 19, and when neither of the electro-magnets is energized there will be no driving engagement between the wheel 18 and either of the disks.

The shaft 21 is connected through the reducing gears 24 with the shaft 25 which operates the rheostat 26 in the circuit of the phonograph and

amplifier 27 from which is operated the loud speaker 27' in a well known manner, the amplifier being supplied with power current from the 110 volt alternating current supply 2 through a suitable rectifier as is well understood, the construction and connection of the rectifier as well as the remaining portions of the amplifier being well understood in the art and requiring no further illustration. Also mounted upon the shaft 25 is the movable member of the rheostat 28 connected with the circuits of the radio set in a well understood manner whereby the volume of sound from the radio set is controlled.

The shaft 25 also operates a switch 29 for making and breaking the circuit of the lights 30 to the 18 volt supply mains 17. Also the shaft 25 operates a switch 31 which connects and disconnects the circuit of the 110 volt alternating current supply 2 with both the radio set and the amplifier 27 for the loud speaker.

The switches 29 and 31 are so constructed and adjusted that they will be opened when there is maximum resistance in the volume control rheostats 26 and 28 and therefore the phonograph and radio are substantially out of operation. When, however, the rheostats or volume controls 26 and 28 are initially moved to reduce their resistances the switches 31 and 29 will be closed thereby putting the loud speaker in operation and also lighting the lights 30 to indicate at the remote control that the apparatus is in operation.

There is also provided a two-way switch 32 adapted to be operated by the shaft 4 of the tuner, the shaft and switch being so related that when the tuner has been turned so that the tuning is out of range of the radio transmitting stations, the switch will be moved to disconnect the connection of the radio set to the amplifier of the loud speaker and to connect the phonograph with the amplifier, conversely, on the turning of the shaft 4 so that the tuner is within the range of the radio transmitting stations the switch 32 will be thrown so that the amplifier will be connected with the radio set and disconnected from the phonograph.

The sound producing means of the phonograph may, as is well understood, comprise a rotatable disk table upon which is a disk cooperating with a needle to vibrate the same, such vibrations acting upon a diaphragm to cause variations of current in the coil 33 in circuit with the amplifier 27 of the loud speaker.

Also fixed upon the shaft 4 is the movable member of a rheostat 34 connected in circuit with a source of current such as the battery 35 and the coil 36 of an electrical indicating instrument of the D'Arsonval type acting in the well-known way of such instruments to operate an indicating hand or pointer 37. For any given position of the shaft 4 (and consequently condition of tuning of the radio set) there will be a certain amount of resistance of the rheostat 34 connected in circuit with the coil 36 and battery 35, and consequently the indicator 37 will occupy a given position. It follows that the indicator 37 will take up a position on the scale 38 which will correspond to the position of the shaft 4, and will vary with the variation in position of the shaft 4. The scale 38 may, therefore, be marked with the respective transmitting radio stations at points occupied by the needle 37 when the shaft 4 is in position so that the radio set is attuned to the respective stations. In this manner any station to which the radio set is attuned at any instant may be read upon the scale 38 by means of the pointer 37. The pointer 37 may also be used to indicate when the radio set is disconnected from the loud speaker and the phonograph is connected by providing a point or area 39 on the scale 38 which will correspond to that position of the shaft 4 when the switch 32 has disconnected the radio set and connected the phonograph with the amplifier for the loud speaker. The variable resistance 39' is provided for adjusting the position of the pointer 37 for any given position of the shaft 4 whereby the calibration of the instrument may be accurately adjusted to the positions of the shaft 4.

It will be seen that the circuit of the magnet 14 to the 18 volt alternating current supply mains 17 will be closed and opened by the closing and opening of the remote switch 40, while the circuit of the magnet 15 will be closed and opened by the closing and opening of the remote switch 41, so that the tuner can be turned in one direction or the other to effect the desired tuning by selectively closing the switches 40 and 41 for appropriate lengths of time, the needle 37 keeping pace with the turning of the pointer shaft.

The circuits of the magnets 22 and 23 through the alternating current mains 17, are respectively controlled by the remote switches 42 and 43, the volume of either the radio sound reproduction or the phonograph sound reproduction being made greater or less by selectively closing the switches 42 and 43 for appropriate lengths of time.

In Figs. 2 and 3 are shown, more in detail, the construction of the apparatus C for operating the radio tuning element and controlling the volume of sound from the radio and from the phonograph. Referring to these figures it will be seen that the driving mechanism for the wheel 11 comprises a shaft 44 upon which the wheel 11 is fixed, the shaft 44 being rotatably mounted in a bracket 45 pivoted in the supporting base at 46. The shaft 44 is connected in driving relation to the motor shaft 47 by means of a joint or clutch 13 comprising the plate 48 secured to the shaft 47 and the plate 49 secured to the shaft 44, the plate 49 having projections 50 which engage with corresponding grooves in the plate 48 whereby the shafts are engaged in rotative driving relation, but sufficient angular movement of the axes of the shafts is permitted to allow the wheel 11 to be moved into and out of engagement with the disks 9 and 10. This movement of the wheel 11 is accomplished by an arm 16 of magnetic material fixed to the bracket 45 and extending into operative relation to the electro-magnets 14 and 15. The arm 16 and the wheel 11 are held in neutral position by springs 51 and 52 secured to the base plate of the apparatus and bearing against opposite sides of the arm 16. When the arm 16 is attracted by one of the electro-magnets 14 or 15 the arm 16 will be moved toward the magnet against the pressure of the spring upon that side of the arm. When one of the magnets releases the arm, the compressed spring 51 or 52, as the case may be, will throw the arm strongly away from the magnet with such force that the wheel 11 will be thrown against the opposite disk on the shaft 8. The power having been cut off from the motor, the motor and parts will be rotating simply under their momentum, and when the wheel 11 comes against the opposite disk as referred to, it will tend to rotate that disk in the opposite direction whereby the apparatus connected to the disk will be brought to a prompt stop. This is of practical importance because it is desired that the apparatus

shall stop promptly, without lag or overrunning, upon the opening of the appropriate switch.

The wheel **18** is similarly connected in driving relation to the motor and is alternately thrown into engagement with the disks **19** and **20** by an arm **53** similar to the arm **16** and which is held between the springs **54** and **55** similar to the springs **51** and **52**, and this arm is operated by one of the magnets **22** and **23** in a manner similar to the operation of the arm **16** by the magnets **14** and **15**.

While the invention has been illustrated in what is considered its best application it may have other embodiments without departing from its spirit and is not therefore limited to the structures shown in the drawings.

What I claim is:

1. The combination with a radio tuning element, of a unidirectional electric motive means for operating said element to effect the tuning operation, driving means between said electric motive means and said element comprising a pivoted driving shaft movable laterally in one direction or in an opposite direction to drive said tuning element in one direction or the other, electro-magnetic means for controlling the direction of lateral movement of said pivoted driving shaft, and means for supplying current to said electric motive means and said electro-magnetic means selectively at will, comprising a source of electricity and switching mechanism.

2. The combination with a radio set comprising a tuning element, of a motor for driving said tuning element and connecting means between said motor and said tuning element comprising a pair of opposed disks and a driving wheel connected to said motor and interposed between said disks, said wheel being movable in opposition to spring pressure against either of said disks, said wheel, when released from contact with one of said disks, being thrown momentarily into engagement with the opposite one of said disks whereby the promptness of stopping of said tuning element upon release of said wheel from one of said disks is enhanced.

3. The combination with a radio receiving set having a movable tuning element, of sound producing means, a phonograph, and an electrically operated indicator remotely positioned with respect to the receiving set adapted to indicate the station positions of said tuning element and the operative condition of said phonograph.

4. The combination with a radio receiving set having a movable tuning element, a phonograph device, sound producing means arranged to be connected in operative relation with said receiving set or with said phonograph device, and an electrically controlled indicator remotely positioned with respect to the receiving set, said indicator having a scale to indicate the station positions of said tuning element and a portion adjacent the scale to indicate the operative condition of said phonograph device.

5. In combination, a radio receiver having a tuning device, an electrical phonograph, sound producing means, driving means for said tuning device, manually controlled mechanism for selectively operating both said driving means and said tuning device in opposite directions, and mechanism controlled by the tuning device for alternately connecting the receiver or the electric phonograph to the sound producing means, the last mentioned connection being made when the tuning device is moved to an extreme position in one of its directions of movement.

6. In a radio set remote control, in combination, means to operate tuning means to tune in stations of various wave lengths by direct and reverse operation of said means, and mechanism to cause the direct and reverse operation of said means, said mechanism including an electric motor and a transmission shaft directly coupled to and driven by said motor, means supporting the shaft for lateral movement in opposite directions, driven members rotatably mounted respectively on opposite sides of said shaft and a driving member secured to said shaft which is selectively engageable with said driven members by reason of the lateral movement of said shaft to cause the direct or reverse rotation of said driven members and consequent direct or reverse operation of said first means.

7. In a radio set remote control, in combination, means to operate tuning means to tune in stations of various wave lengths by direct and reverse operation of said means, and mechanism to cause the direct and reverse operation of said means, said mechanism including a transmission shaft, means supporting the shaft for lateral movement in opposite directions, driven members rotatably mounted respectively on opposite sides of said shaft and a driving member secured to said shaft which is selectively engageable with said driven members by reason of the lateral movement of said shaft to cause the direct or reverse rotation of said driven members and consequent direct or reverse operation of said first means.

8. In a radio set remote control, in combination, means to operate tuning means to tune in stations of various wave lengths by direct and reverse operation of said means, a transmission shaft, means including a bearing member having pivotal movement supporting said shaft for rotational and lateral movement in opposite directions, resilient means connected with said bearing member to yieldably retain said shaft in a neutral position, driven members rotatably mounted respectively on opposite sides of said shaft, a driving member secured to said shaft, means gearing said driven members with said first means to directly or reversely operate the latter by the direct or reverse rotation of the driven members, and means to cause the pivotal movement of said bearing member to cause the engagement of said driving member with one of said driven members to cause the direct rotation of said tuning means, or to cause the engagement of the driving member with the other driven member to cause the reverse rotation of said tuning means.

9. In a radio set remote control, in combination, means to operate tuning means to tune in stations of various wave lengths by direct and reverse operation of said means, and mechanism to cause the direct and reverse operation of said means, said mechanism including a transmission shaft, means supporting the shaft for lateral movement in opposite directions, driven members rotatably mounted respectively on opposite sides of said shaft, and a driving member secured to said shaft which is selectively engageable with said driven members by reason of the lateral movement of said shaft to cause the direct or reverse rotation of said driven members and consequent direct or reverse operation of said first means, and electromagnetic means cooperating with said shaft-supporting means, to cause said lateral movement of the shaft.

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