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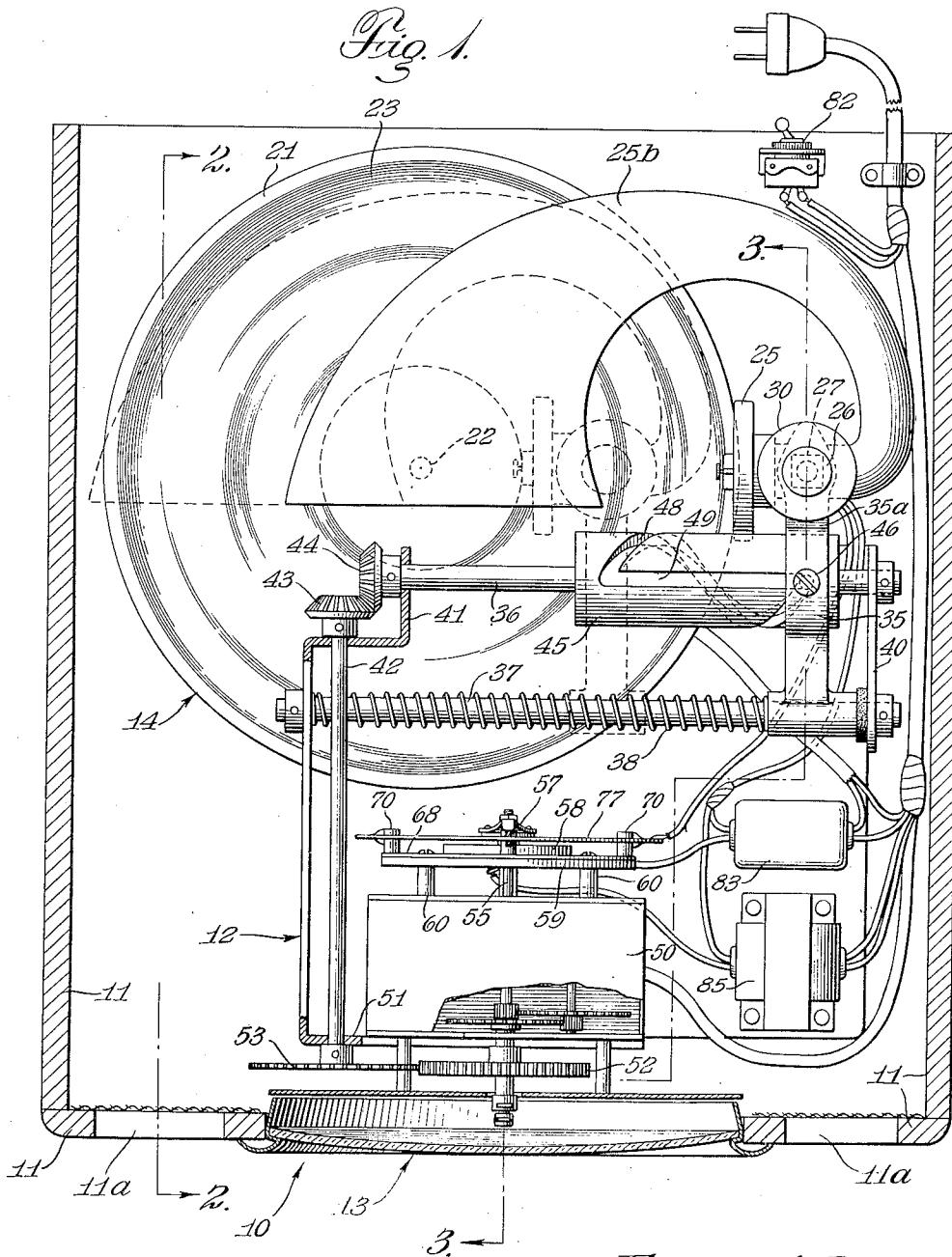
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2,260,655

TIME CONTROLLED ANNUNCIATOR

Filed Oct. 2, 1939

3 Sheets-Sheet 1



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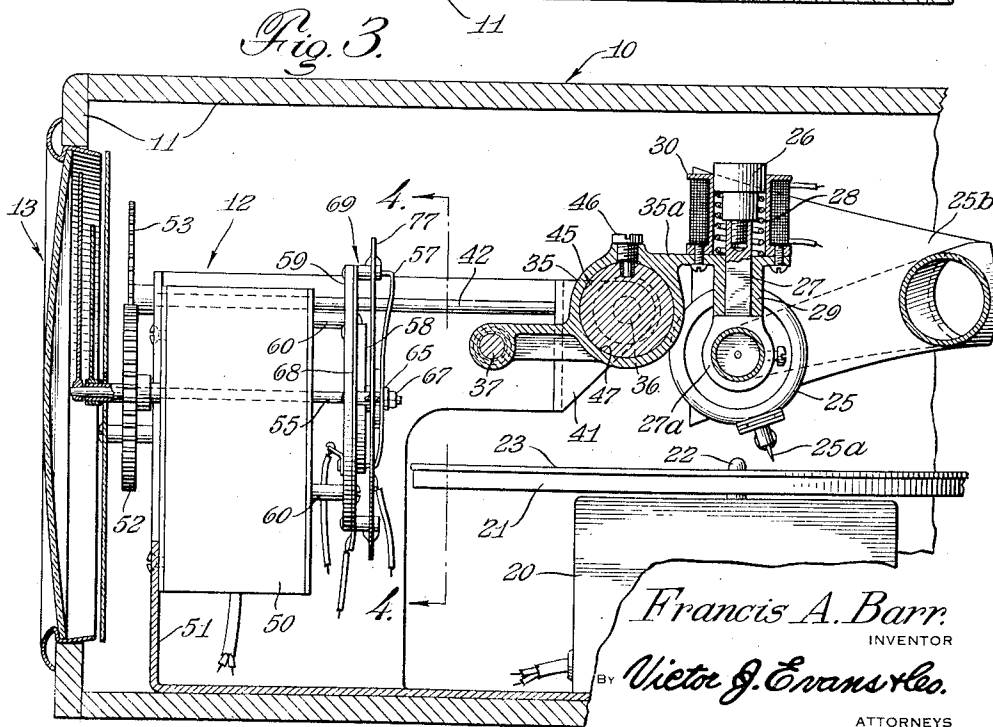
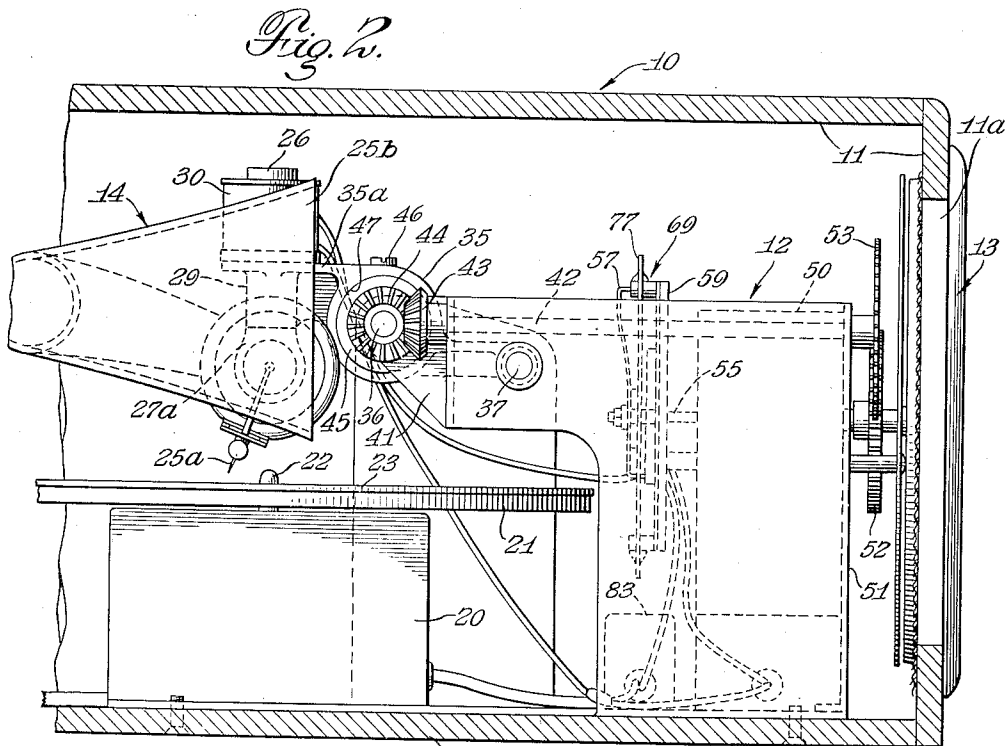
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3 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,260,655

TIME CONTROLLED ANNUNCIATOR

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Application October 2, 1939, Serial No. 297,583

2 Claims. (Cl. 58-14)

This invention relates to improvements in annunciators and especially is concerned with a time controlled annunciator for periodically making audible announcements.

It is an object of this invention to provide a novel and audible annunciator controlled in a new and superior manner by a clock or the like whereby, at preselected intervals, an announcement is made.

Another object of this invention is to provide an annunciator comprising a sound reproduction device for a clock for controlling same, the clock and device being interconnected whereby the former operates to initiate and to stop operation of the latter at preselected time intervals.

Another object of this invention is to provide an annunciator of the type hereinabove mentioned which, in operation, serves to facilitate the making of a plurality of different announcements at spaced time intervals independently of manual operation.

Another object of this invention is to provide an annunciator of the type comprising a moving sound record and a clock controlled sensing device for reading said record together with means for operating said sensing device to read a preselected announcement from said record corresponding to a preselected relative or absolute time value.

A feature of the novel annunciator according to this invention is that it can be operated continuously for use in announcing time intervals or in the making of other announcements in a predetermined sequence. This feature follows as a result of the provision in the device of novel means for restoring elements of the device to an initial position of operation.

An advantage of the annunciator according to the present invention is its comparative simplicity both from the standpoint of structure and of operation whereby both the initial cost and the likelihood of need of repair is minimized.

Other objects, advantages and features of the new and improved time controlled annunciator according to the present invention will be apparent to those skilled in this art during the course of the following description.

In order to facilitate a fuller and more complete understanding of the matter of this invention, a specific embodiment thereof now preferred hereinafter will be described, it being clearly understood of course that this embodiment of the present invention is provided solely by way of example and is non-limitative upon

the scope of the invention except as same is expressed in the subjoined claims.

Referring then to the drawings,

Figure 1 is essentially a top plan view of the preferred embodiment of the instant invention with parts of the casing removed to expose interior structure,

Fig. 2 is essentially a vertical sectional view of Fig. 1 taken along the line 2-2,

Fig. 3 is substantially a vertical sectional view of Fig. 1 taken along the line 3-3,

Fig. 4 is a vertical sectional view of Fig. 3 taken along the line 4-4,

Fig. 5 is substantially a vertical sectional view of Fig. 4 taken along the line 5-5,

Fig. 6 is essentially a fragmentary or detailed sectional view of Fig. 5 taken along the line 6-6 thereof, and

Fig. 7 is essentially a schematic electrical circuit diagram indicating electrical connections between elements of the device.

It will be apparent in considering the drawings that the novel annunciator designated by the numeral 10 according to the present invention comprises mounted within a casing 11 a clock mechanism generally designated by the numeral 12 having an exposed dial generally indicated by the numeral 13 and, associated therewith, a sound reproduction device generally designated by the numeral 14.

The sound reproduction device comprises a constant speed motor 20 for rotating a turntable 21 mounted on the spindle 22 of the motor. The turntable is adapted to accommodate the sound record 23 which, in the illustrated embodiment, is a relatively flat disc similar to the conventional phonograph record having sound grooves or tracks formed on the surface thereof. The sensing mechanism 25 provided with a needle 25a for reading the grooves or tracks on the sound record 23 is vertically slidingly carried on the solenoid core 26, being attached thereto by the coupling 27 substantially as shown. It will be noted that the solenoid core is normally spring-pressed upwardly by the helical spring 28 whereby the coupling head 27a is pressed against bottom portions of the sleeve 29 forming part of the solenoid mounting as hereinafter more fully will appear. It will be noted especially, upon reference to Fig. 1, that the connector member 27 is substantially square in cross-sectional outline and, accordingly, that rotative motion of the connector with respect to the sleeve 29 is substantially precluded. The solenoid core 26 normally is positioned in coaxial relation to but not within the

solenoid 30. Accordingly, when current passes through the solenoid, the core 26 is drawn downwardly and the needle or stylus 25a of the pickup head 25 is lowered into reading position upon the surface of the record 23.

The solenoid 30 and the sleeve 29 are respectively mounted upon and formed integral with the projecting end portion 35a of the carriage head 35, the latter being freely slidingly mounted upon horizontally extending substantially parallel rods 36 and 37. It is to be noted that the carriage head 35 is pressed by a spring 38 toward the supporting frame element 40 in which ends of the rods 36 and 37 are mounted. While the rod 37 preferably is nonrotatably mounted, although, if preferred, it may be rotatably mounted, the rod 36 is freely rotatably mounted in the frame standards 40 and 41 and is driven at a constant rate of rotation by the clock driven shaft 42 connected to the rod by the beveled gears 43 and 44.

The cylinder 45 essentially fixedly mounted on the rod 36 and rotatable therewith is freely rotatably received within the opening 47 of the carriage head 35 in a manner such that the carriage can freely slide along the cylinder while the latter is being rotated. A continuous cam slot comprising the leading groove 48 and a return groove 49 is formed in the cylinder 45 and a cam rider 46 is mounted in parts of the carriage head 35 for engagement with the cam slot. It will be evident that as the cylinder 45 rotates, the cam rider 46 will ride in the lead groove 48, thereby causing the carriage 35 to move oppositely to the direction of action of the spring 38 until such time as the cam rider enters the return groove 49, whereupon the carriage head will be returned to starting position by action of the spring 38. It is to be noted that, as the carriage head 35 moves, the sound amplifying arm 25b connected with the pickup head 25 hereinabove described likewise is moved laterally. It is to be noted that the motion of the cam rider 46 within the cam grooves causes the pickup head 25 to traverse the record 23 and, at such times as current passes through the solenoid 30, to ride the grooves or tracks of the sound record and read same.

The hereinabove mentioned clock mechanism and the electrical control switches associated therewith generally designated by the numeral 12 will now be described, reference being made especially to Figs. 1, 3, 4, 5 and 6 wherein features of the switch mechanism best are illustrated. Initially it should be noted that the clock mechanism 50 mounted on the frame 51 is provided with a gear 52 carried on the hour shaft thereof which, engaging with the teeth of the gear 53 mounted on the shaft 42, causes uniform constant motion of the cam 45 hereinabove described. The shaft 55 carrying the minute hand of the clock is extended backwardly from the clock mechanism and carries fixedly mounted thereon and electrically insulated therefrom an intrinsically resilient switch arm 57, one end of which rides on a continuous annulus 58 of electrically conductive material mounted upon an electrically insulative disc 59 supported on standards 60 attached to the rear of the clock casing. The preferred and illustrated mode of mounting the arm 57 upon the shaft 55, comprises a bushing 65 formed of electrically insulated material attached to the arm by rivets 66 and held upon the shaft 55 by a nut 67 essentially as shown. The opposite end of the arm 57 rides upon a plu-

rality of groups of contact elements, one of which is generally designated by the numeral 69.

Reference is now made especially to Fig. 6 wherein details of a typical one of the groups of contact elements best are illustrated. It will be noted that the group generally designated by the numeral 69 comprises a post 70 formed of electrically conductive material mounted in parts of the electrically insulative disc 59 and interconnected by the annulus 68, as hereinafter more fully will appear, slotted along its axis to receive a sheath 71 of insulative material within which is positioned the contact member 72. It is especially to be noted that, as the end of the arms 57 passes over the beveled top of the post 70, electrical contact is established between the arm and the post and also between the arm and the centrally located contact element 72. It is further to be noted that the width of the end of the arm 57 is such with relation to the beveled end of the post 70 that, as the arm traverses the post end, electrical contact is established between the arm and the post before, during and after the contact is established between the arm and the contact element 72. The posts are electrically connected each with the other by the annulus 68 above mentioned upon which the end of the arm 57 rides. It of course will be understood that the post ends are beveled to facilitate free travel of the arm end thereover. The centrally located contact elements 72 are formed integral with and interconnected by the annulus 77, it being noted that the contact elements are formed by a right angle band and radially inwardly extending arms formed on said annulus. It is further to be noted that the groups of contact elements are arcuately spaced and that each is traversed by the end of the arm 57 successively and at predetermined time intervals between the elements depending upon the spacing of the elements.

The manner in which the above described sound reproduction device and clock control mechanism are concatenated for the operation of the former by the latter will now be described, reference being made especially to Fig. 7 wherein it will be noted that the clock motor 50 normally is connected across the power lines 80 and 81 but that a switch 82 is interposed in the line 80 to permit interconnection of other parts of the device from the power lines. A relay 83 controls connection of the phonograph motor 20 to the lines 80a and 81 whereby, when the switch 82 is closed, the line 80a possesses equal potential with respect to the line 81 as is possessed by the line 80 with respect thereto. The relay 83 operates from the output lines 84 of the transformer 85 and current is supplied to the relay through the annulus 58, arm 57 and contact elements forming part of the posts 70 or, in other words, the relay functions whenever the end of the arm 57 makes contact with one of the beveled end portions of a post 70. Hence it will be apparent that the relay is closed and the phonograph motor 20 operates at all times when the end of the arm 57 is in electrical contact with any one of the groups of contact elements, one of which is designated by the numeral 69.

As has been hereinabove observed, contact is established between the end of the arm 57 and parts of the posts, one of which is designated by the numeral 70, before, during and after the establishment of electrical contact between the arm end and the centrally located contact elements,

one of which is designated by the numeral 72. It will be noted by referring to the circuit diagram of Fig. 7 that when the arm end contacts the centrally located contact element, connection is established between the output lines 84 of the transformer 85 and the solenoid 30, thereby causing the core 26 thereof to be drawn within the solenoid against the action of the spring 28.

Having thus described the structural features of the novel time controlled annunciator according to the present invention, its mode of operation next will be described. As was above noted, the clock motor 50 operates continuously, being connected to the power lines 80 and 81. Closing of the switch 82 supplies power to the transformer 85 and also, upon closing of the relay 83, supplies power to the phonograph motor 20. Inasmuch as the arm 57 is driven by the minute shaft of the clock 50, eventually the end of the arm will engage and make electrical contact with one of the beveled ends of a post 70, thereby causing operation of the relay 83 and starting of the phonograph motor 20. As the end of the arm 57 passes over the post end, electrical contact is established between the arm and the centrally located contact element 72 whereby current passes from the transformer 85 to the solenoid 30 drawing the core thereof downwardly and causing the stylus or needle 25a to sense sound tracks or grooves in the record 23. The solenoid core is held within the solenoid until such time as the end of the contact arm passes from a centrally located contact 72, at which time action of the spring 28 causes the solenoid core to move upwardly, thereby raising the pickup head from the record. The phonograph motor 20 functions until such time as the end of the arm 57 ceases to make contact with parts of the post 70.

It will be evident from the foregoing that time spaced announcements can be made by means of this annunciator and that a series of different announcements can be made inasmuch as the pickup head 25 is moved across the sound record by time controlled mechanism with the result that the sound track beneath the pickup head is different from the sound track beneath the pickup head at other times.

Having thus described the present invention,

what it is desired to secure by Letters Patent is:

1. In a time controlled annunciator of the type including a rotatable support for a sound producing record, a carriage mounted on a horizontal bar extending across the record, a spring surrounding the bar for normally holding the carriage adjacent the edge of the record, a sensing device carried by the carriage for reading said record, a solenoid for raising and lowering said sensing device off and on the record, a motor for driving said record, a clock, a switch operated by the clock for controlling the solenoid and the motor, a sleeve passing through the carriage and continuously rotated by the clock, a spiral groove in the sleeve and a straight return groove connecting the ends of the spiral groove, a projection carried by the carriage and travelling in said grooves, whereby the carriage is moved across the record by its engagement with the spiral groove and rapidly returns to its normal position under tension of the spring when the projection enters the straight groove.

2. In a time controlled annunciator of the type including a rotatable support for a sound producing record, a carriage mounted on a horizontal bar extending across the record, a spring surrounding the bar and engaging the carriage for normally holding the same adjacent the edge of the record, a sensing device carried by the carriage for reading the record, a solenoid for raising and lowering the sensing device off and on the record, a motor for driving the record support, a clock mechanism, a switch operated by the clock mechanism for simultaneously starting the motor and energizing the solenoid, a rotatable sleeve passing through the carriage and supporting one end thereof, means operated by the clock mechanism for continuously rotating the sleeve, said sleeve having a spiral groove and a straight return groove connecting the ends of the spiral groove, a projection carried by the carriage and travelling in said grooves, whereby the carriage is gradually moved across the record against the spring by the spiral groove and is rapidly returned by the spring when the projection enters the straight return groove.

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