V. AND J. PINTO.

SPEAKING CLOCK.

APPLICATION FILED JULY 27, 1920.

1,424,516.

Patented Aug. 1, 1922.

5 SHEETS—SHEET 1.

Fig. 1.

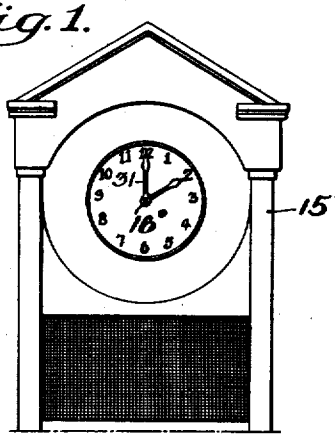


Fig. 8.

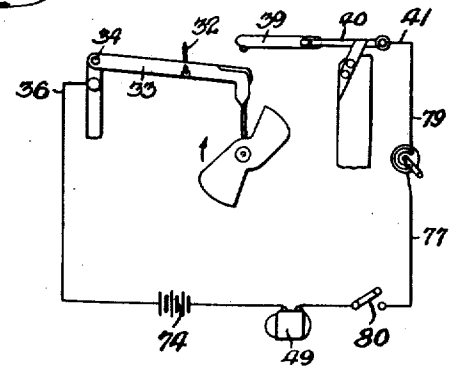


Fig. 3.

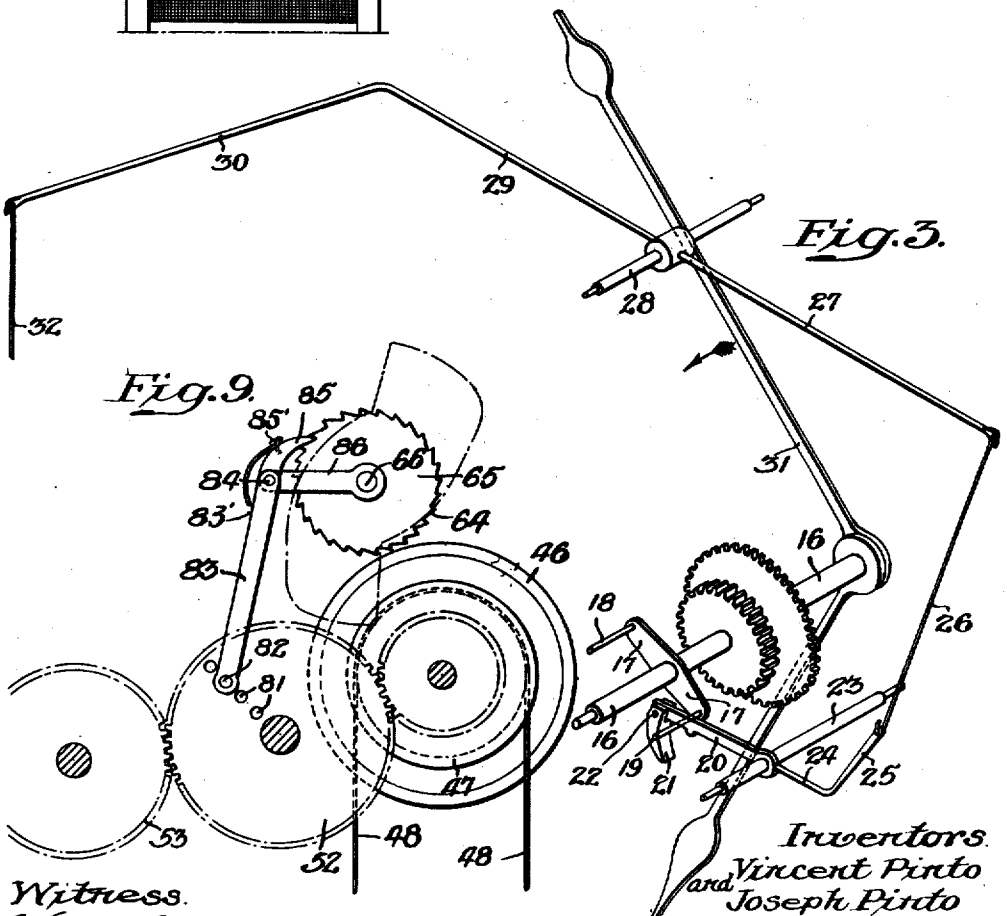


Fig. 9.

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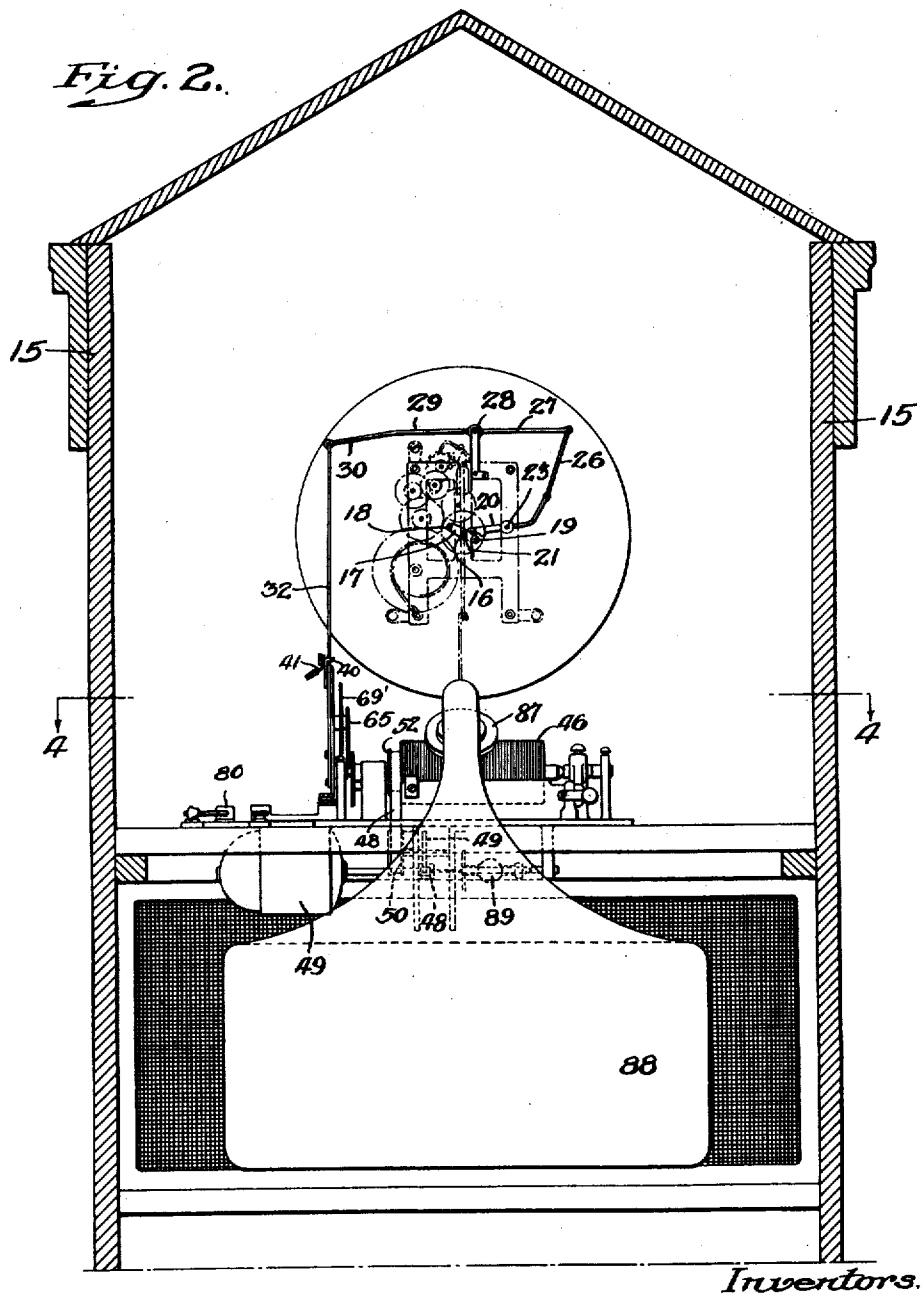
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5 SHEETS—SHEET 2.

Fig. 2.



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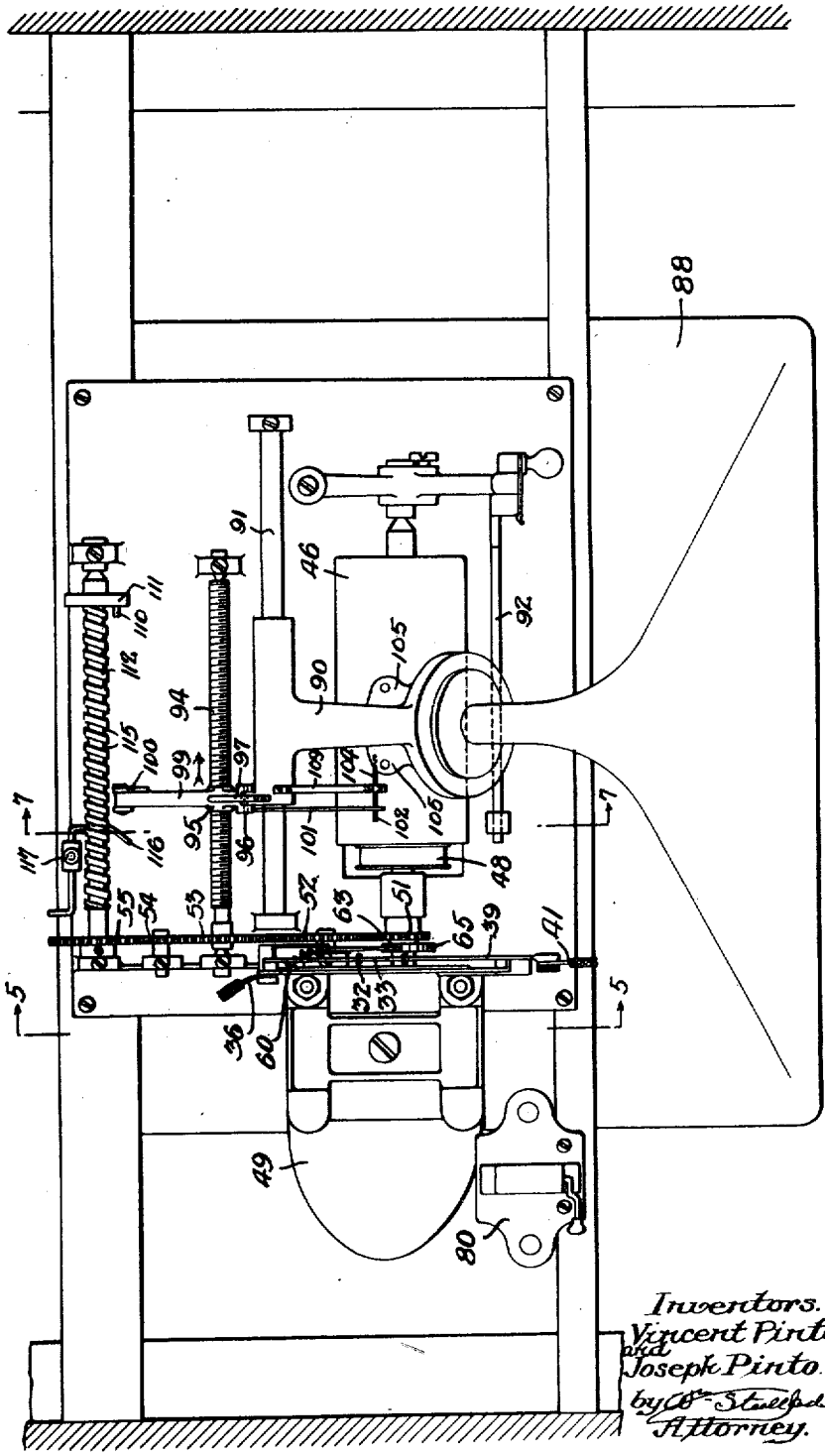
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5 SHEETS—SHEET 3.

Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 5.

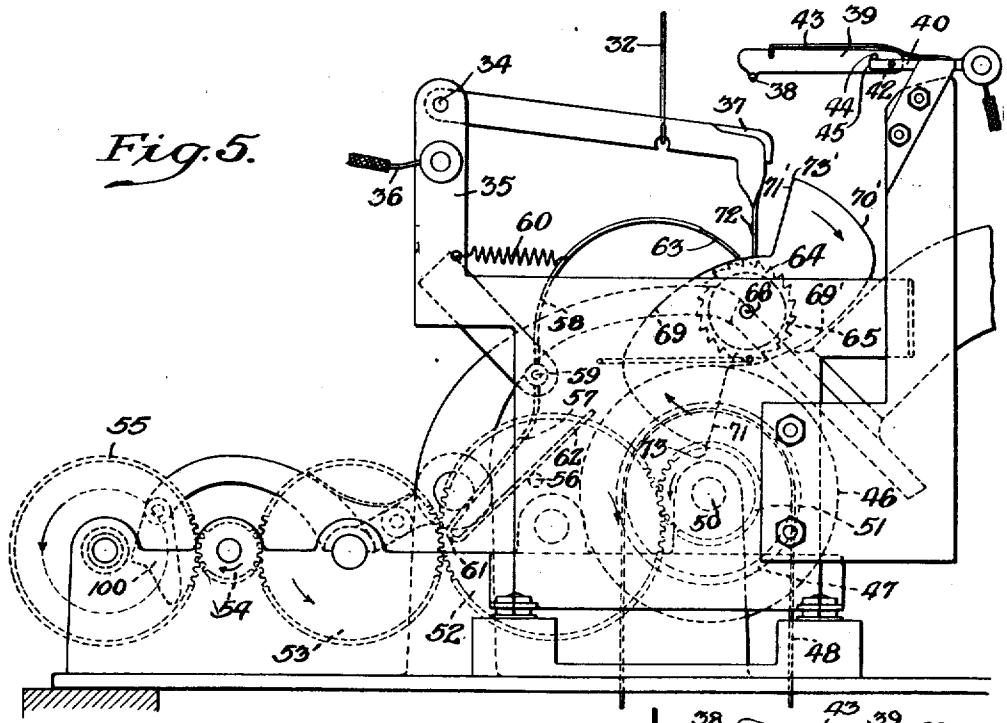
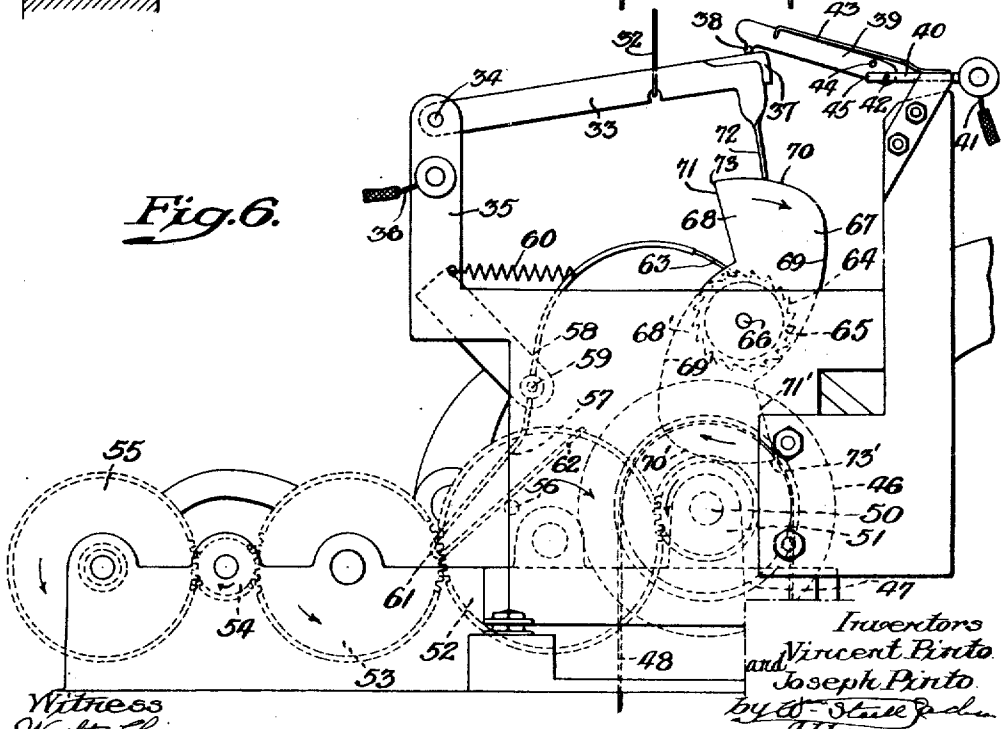


Fig. 6.



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5 SHEETS—SHEET 5.

Fig. 7.

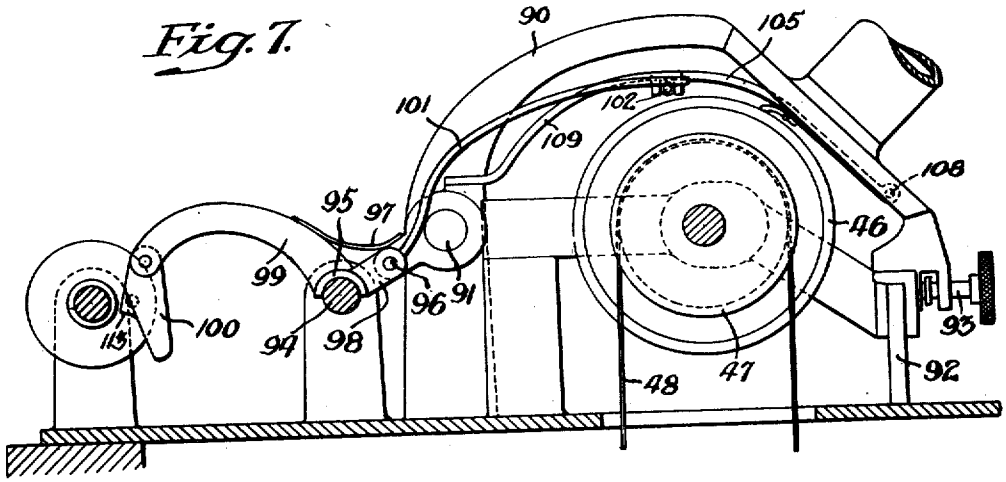


Fig. 10.

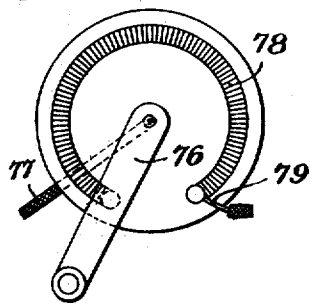
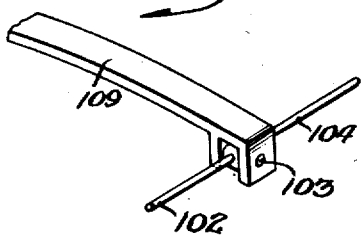


Fig. 11



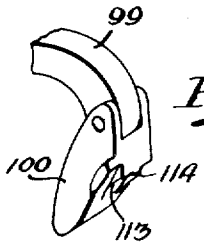


Fig. 12.

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UNITED STATES PATENT OFFICE.

VINCENT PINTO AND JOSEPH PINTO, OF PHILADELPHIA, PENNSYLVANIA.

SPEAKING CLOCK.

1,424,516. Specification of Letters Patent. Patented Aug. 1, 1922.

Application filed July 27, 1920. Serial No. 399,371.

To all whom it may concern:

Be it known that we, VINCENT PINTO and JOSEPH PINTO, subjects of the King of Italy, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Speaking Clock, of which the following is a specification.

Our invention relates to clock mechanisms which are interconnected with phonographs, so that the clock intermittently operates the phonograph.

The purpose of our invention is to make the connection between the clock and the phonograph more positive and reliable.

A further purpose is to cause or permit phonograph operation preferably by making electrical connections at predetermined times, maintaining the phonograph in operation positively during the intended time and stopping it quickly preferably by breaking the connections.

A further purpose is to support a phonograph operating switch or control by a cam, maintaining the switch or control in operative position thereby, while moving the cam in accord with the movement of the phonograph and opening the switch or control by withdrawing the cam support.

A further purpose is to simplify the connection of the phonograph with the clock.

A further purpose is to provide for automatic, quick and effective return of the phonograph stylus to operative position ready for another cycle of operations.

Further purposes will appear in the specification and in the claims.

We have preferred to illustrate our invention by but one form, selecting a form which is practical, efficient, reliable and inexpensive, and which at the same time well illustrates the principles of our invention.

Fig. 1 is a front elevation of a clock to which our mechanism is applied.

Fig. 2 is a section chiefly in rear elevation, showing the clock and phonograph in position.

Fig. 3 is a perspective view, showing the clock end of operative connections between the phonograph and clock.

Fig. 4 is a section of Fig. 2, taken upon lines 4—4.

Fig. 5 is a section taken upon Fig. 4 on lines 5—5.

Fig. 6 is a section corresponding to Fig. 5, showing the parts in different positions.

Fig. 7 is a section of Fig. 4, taken upon lines 7—7.

Fig. 8 is a diagrammatic figure showing the electrical connections.

Fig. 9 is a side elevation showing slightly different cam operation.

Fig. 10 is a side elevation of a rheostat seen in Fig. 8.

Fig. 11 is a perspective view of a joint used in raising the stylus.

Fig. 12 is a perspective view of the engaging finger for returning the stylus.

In the drawings similar numerals indicate like parts.

We appreciate that phonographs have previously been operated by clocks but have directed our attention particularly to insuring effective and continued control of phonograph operation during the proper time to deliver the intended message, quick and complete energy disconnection when the phonograph is to be stopped, automatic, complete and effective resetting of the phonograph parts when the complete record or any predetermined part of the record has been used and simplification and general improvement of the connecting parts for phonograph operation and control.

The clock 15 need have no special form, except that a shaft, here its main shaft 16 is intended to carry an arm or arms 17 upon which are mounted operating devices here shown as two in number 18 and 19, by which the phonograph mechanism is tripped. The two devices shown provide for half hour announcement of the time and they may be increased in number to announce the quarter hours, for example, if desired.

At intervals these devices 18 and 19 engage an arm 20 whose effective length is extended by an auxiliary arm 21 pivoted at 22 and restricted in its movement so that it can be turned to the left in Figure 3, to such an extent only as to make its length lie approximately in line with the arm 20.

The arm 20 is pivoted upon a shaft 23, is extended at 24 beyond the shaft and is bent at 25 to connect through a rod 26 with a rocked arm 27. This arm is pivoted about a shaft 28 so that the extension 29 conveniently turned at 30 (so as to more readily engage with the parts of the phonograph) will be lifted when the arm 20 and extension 21 are lifted. The parts are so weighted that the extension 29 and arm 20 fall by their own weight and the weight of the connected

parts when the devices 18 and 19 release from the arm 20. At the same time the extension 21 swings to the right from its extended position to the position seen in Figure 3.

The extension of the lever arm 20 is effected to give a greater length to arm 20 than would otherwise be permissible because of the nearness of the shaft 16 and (possibly) other clock mechanism, and a quick release.

As we are looking at Figure 3 from the back the shaft 16 and hand 31 move in counter-clockwise direction in this figure with the result that the arm 20 will be lifted twice and the arm 29 will correspondingly be twice lifted for each rotation of the shaft 16. It will be evident that the bends and turns of the arms as well as the relative locations of the arms and their pivotal shafts will be determined in large measure by the room available and by the particular clock mechanism selected as it affects this room.

The lifting of the arm 29 lifts a connection 32, by which the switch lever arm 33 is lifted about its pivot 34 in fixed frame member 35.

The electrical connections for the motor are closed from a conductor 36 secured to frame 35 through the pin 34, contact arm 33, contacts 37 and 38, arm 39 and connection 40 to a second conductor 41 so that the raising of the arm 33 by means of rod 32 closes the circuit by bringing the contacts 37 and 38 together. We insure a good rubbing contact between the parts by providing for some movement of the respective arms 33 and 39 after their contacts 37 and 38 come into engagement. We provide for the movement of arm 39 by pivoting it at 42 and spring-pressing it downwardly at 43. The limit of downward movement is taken care of by a pin 44 which engages the end 45 of a bracket which in this case forms the support for the arm 39 and also the electrical connection between this arm and the conductor 41.

Though the lifting of the arm 33 by clock actuation brings the contacts 37 and 38 together, it can not be depended upon to lift the arms to give rubbing engagement nor to hold them in engagement during an extended period of time. Even if this were relied upon it would not require operation for an exact number of turns of the phonograph record to insure complete delivery of the message and correct starting point for the next message.

In order therefore to relieve the clock of the strain of holding the arm 29 raised, to make it possible to raise it higher without requiring that this be done by the clock against the spring resistance of arm 39, in order to maintain the contact reliably during a predetermined period, measured by revolutions of the phonograph as distinguished from clock movement and to give a quicker break of the connections (free from clock retardation) when the electrical circuit is to be opened, we supplement the clock closing of the contacts by phonograph control of the contact. This is done through a cam which may be made to lift the lever 29 higher than it may be desired to lift it by the clock, releasing the extension of arm 20 by reason of lifting arm 20 and to hold arm 33 in lifted position during the extended period as measured by phonograph operation. During this period the clock support of lever 29 is withdrawn by disconnection of the devices 18 and 19 from the extension of the arm and the circuit may then be broken quickly and reliably by removing the cam support for arm 33 and allowing the arm to drop.

We have preferred to use the cylinder form of phonograph on account of the greater compactness of the construction secured by it and we show the phonograph cylinder at 46, mounted in any suitable bearings and operated through a pulley 47 and belt 48 from a motor 49 suitably mounted. The motor is energized by closing of the contacts 37 and 38 and immediately begins to operate, so as to cause rotation of the cylinder 46.

Movement of the cylinder operates a train of gearing through shaft 50 upon which the cylinder is mounted, including gears 51, 52, 54 and 55 in train therewith mounted upon appropriate shafts, suitably supported.

One of these gears, here shown as gear 52, carries a pin 56 which engages with one end 57 of a latch arm 58 pivoted at 59 and spring retracted at 60. To give additional resilience to the operation, the lower part of this arm is reversely bent at 61 to provide a spring contact portion 62 with which the pin 56 engages.

The latch end 63 of this latch arm engages with teeth 64 of a ratchet wheel 65 mounted upon any suitable shaft 66 and carrying a cam 67. This cam is provided with two ends 68 and 68′ which have sloping cam surfaces 69, 69′, rests or dwells 70, 70′, and abrupt terminal edges or falls 71 and 71′. The arm 33 is downwardly extended at its end at 72 to engage with the edge of the cam surfaces successively.

With the construction shown, as soon as the motor is energized by partial lifting of the lever 33, the cylinder 46 starts to deliver its message and, through rotation of gears 51 and 52 and operation of the latch arm, the cam begins to turn. The slope 69 or 69′ lifts the end of lever arm 33 so that the arm 20 is lifted. In the meantime, the device 18 or 19 is moved about to such a point that when the arm 20 has been sufficiently lifted (either before the end 72 engages with dwell 70 or 70′, or early in this engagement) the extension 21 will fall free from the device 18 or 19, relieving the clock of all further strain from the connecting mechanism and

allowing the shaft 16 and arm 17 to continue their travel without restraint until time for the next electrical contact.

The cam continues to operate lifting the nose 72, raising arms 33 and 39 and thereby ensuring good rubbing contact of 37 and 38; and this contact is ensured with maximum lifting of arms 33 and 39 by final engagement of nose 72 with the dwell 70 or 70'. This maintains operation of the motor until the nose drops off the edge of "fall" 73 or 73' of the cam, at which time the contacts 37 and 38 are interrupted and the motor stops, the parts named remaining in stationary position until the next connection of the contacts 37 and 38 through the clock mechanism.

The motor is operated by current from a battery 74 and the speed is controlled through a rheostat 75 as best seen in Figures 8 and 10. The rheostat arm 76 is shown as connected with one of the circuit conductors 77 and the end of the resistance element 78 is connected with the other at 79. A switch 80 is provided to open the circuit completely when desired.

A simple alternative construction for operating the ratchet wheel 65 is shown in Fig. 9 in which the gear 52 is provided with holes 81, affording different points of connection for a pivot pin 82 forming a crank pin for operation of a link 83. The link is pivoted at 84 to a pawl or latch 85 and to a guiding arm 86 swinging about shaft 66. The pawl is controlled with respect to the link 83 by a spring 83', which presses it in to a predetermined extent. Pin 85' prevents the pawl from falling forward completely. As a result, the pawl 85 engages with the ratchet teeth 64 during the time that the pin 82 is at the left hand part of its circle of movement and for different lengths of time according to the opening 81 in which the pin 82 is placed, thus giving an adjustment of the extent of operation of the ratchet wheel for each rotation of the gear 52. It will be evident that this may be made to give comparatively rapid rotation of the ratchet wheel and cams, corresponding to short messages upon the phonograph record.

It will be evident that the duplication of the cam surfaces is for the purpose merely of requiring less rotation of the ratchet wheel to accomplish the desired cam function, and that a single cam or any number of cams desired may be used, allowing discretion in design in this feature as in all other features of the constructions shown, and not restricting to the exact construction in view of the teaching of the invention herein.

The phonograph shown is a conventional one, having a sound box 87, horn 88 and any suitable governor 89. The sound box is carried by an arm 90, pivoted at 91 and is guided along a bar 92 upon which it is held by a latch 93. Movement of the stylus arm is controlled by a feed screw 94 and half-nut 95, by which, with normal operation of the machine, the gear 53 turns the thread 94 in a counter-clockwise direction in Fig. 6, so as to advance the nut, and hence the stylus, to the right in Fig. 4, reproducing the record which may be upon the cylinder.

The half-nut 95 is pivoted about a center at 96 and is held in place by a spring 97, upon any fixed support. The arm 98 carrying the half-nut is extended at 99 to the left in Fig. 7, terminating in a resetting latch 100. At the opposite side, arm 96 is rigidly connected with an arm 101, engaging the end 102 of a lever arm, operating as a rocker arm, which is pivoted at 103, and whose opposite end 104 is adapted to lift a plate 105 by which the stylus is supported at the left end Fig. 7, the stylus being pivoted at 108 in that figure. The pivot 103 is supported in the supporting bracket 109, movable with arm 90.

With movement of the stylus bodily in the direction of the arrow in Fig. 4 under the influence of the feed screw 94, with repeated announcements by the phonograph, the latch 100 is finally brought within the path of movement of a pin 110 upon a collar 111 carried by return screw 112 which is rotated in a counter-clockwise direction (Fig. 6) by the gear 55. This pin 110 engages beneath a shoulder 113 (Fig. 12) in the latch 100 lifting the latch and moving it toward the left in Fig. 7 (the right in Fig. 12) so that the rib 114 will engage with and, because of the shape of the parts and direction of the latch, will be held in contact with the threads 115 of screw 112. In the meantime the lifting of the latch has lifted the end of arm 99, lifting the half-nut 95 free from the feed screw 94 and the resultant downward movement of arm 101 has moved arm 102 downward and lifted arm 104, lifting the stylus and leaving the entire reproducing mechanism free to be reset by the return screw 112. This therefore causes reverse travel of all of the parts which are movable longitudinally of the record cylinder. The movement continues until an arm 116 wedges the latch 100 out from its engagement with the threads 115, permitting the half-nut to again engage the feed screw.

The arm 116 may be set adjustably in a support 117.

The reversal can be designed to take place in connection with one of the ordinary half hourly or quarter hourly announcements, where these are long, by cutting short the announcement or may take the place of the announcement, using the time of motor operation which would ordinarily be utilized for the announcement for the purpose of setting the parts for return movement and moving them in position to start again.

It is obvious that the regular clock actu-

ation to cause hourly, half hourly or quarterly announcements can be superseded by adjustable actuating mechanism for giving an alarm, utilizing the rest of our invention unchanged except as to the announcement or record to be given, and that the only changes required for such an alarm would be in the position or character of the actuating devices, forming part of the connection between the clock and the lifting mechanism. We therefore contemplate including herein all such features as are capable of use with actuation for alarm purpose, with equal application to interval announcements and alarms.

We desire to include within our claims all those forms of our invention which will suggest themselves to other designers in the same art in view of our disclosure herein and which come within the reasonable spirit and scope of our claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a speaking clock, a clock, a phonograph, a motor for operating the phonograph, contacts for closing the motor circuit, clock-operated means for closing the contacts and motor-operated means for maintaining the contacts in closed position independently of the clock-operated closing means.

2. In a speaking clock, a phonograph, a motor for operating the phonograph, contacts adapted to close and open the motor circuit, clock-operated means for initially closing the contacts and motor-operated means for independently holding the contacts closed and releasing the clock-operated closing means.

3. In a speaking clock, a clock, a phonograph, an electric motor for operating the phonograph, a pair of contacts in the electric motor circuit, clock-operated means for closing the contacts and motor-operated means for maintaining the contacts in closed position beyond the time that they are kept closed by the clock-operated means.

4. In a speaking clock, a clock mechanism including a rotatable shaft, an actuating device carried thereby, a lever lifted by the device, a pair of contacts, connections from the lever closing the contacts, a pivoted extension on the lever with which the device finally engages, an electric motor whose circuit is closed by closing the contacts, a phonograph operated by the motor and means operated by the motor for additionally lifting the lever to cause the extension to free from the device.

5. In a speaking clock, a clock mechanism including a rotatable shaft, an actuating device carried thereby, a lever moved by the device, a pair of contacts, connections from the lever closing the contacts, a pivoted extension on the lever with which the device finally engages, a motor-operated phonograph, and a cam and connections operated by the motor for lifting the lever to free it and the extension from engagement by the device.

6. In a speaking clock, a clock mechanism including a rotatable shaft, an actuating device carried thereby, a lever lifted by the device, a pair of contacts, connections from the lever whereby the contacts are closed, a pivoted extension on the lever with which the device finally engages, a phonograph, a motor therefor, a cam operated by the motor, and connections adapted to lift the lever and maintain the contacts in engagement while the extension falls free from the device.

7. In a speaking clock, a clock mechanism including a rotatable shaft, an actuating device carried thereby, an arm moved by the device, a pair of contacts, closing connections therefor from the arm, a pivoted extension on the arm with which the device finally engages, a phonograph operated by the motor and a cam and connections for lifting the arm until its extension is free from the device and to meantime maintain the connection between the contacts.

8. In a speaking clock, a clock mechanism including a rotatable shaft, an actuating device carried thereby, an arm lifted by the device, a pair of contacts closed by the arm, a pivoted extension on the arm with which the device finally engages, a phonograph operated by a motor and a cam and connections operated by the motor for lifting the arm, maintaining it in lifted position and the contacts in engagement until the device has passed beyond control of the arm and then allowing the arm to drop and the contacts to open.

9. In a speaking clock, a phonograph motor, a phonograph operated thereby, a pair of contacts adapted to close the circuit of the motor, clock-operated means for closing the contacts and a cam operated by the motor for maintaining the contacts in closed position during the intended operation of the phonograph.

10. In a speaking clock, an electric phonograph motor, a phonograph operated thereby, a pair of contacts adapted to close the circuit of the motor, clock-operated means for closing the contacts and a cam operated by the motor having a lifting surface, a dwell and a fall adapted to secure and maintain electrical connection and permit it to be abruptly broken by movement of the cam.

11. In a speaking clock, a clock, a rotatable shaft therein, an actuating device movable thereabout, an arm adapted to be moved by the device and a pivotal extension of said lifting arm adapted to swing free from the

device when the arm is moved beyond the device.

12. In a speaking clock, a phonograph, a clock, an electric motor for operating the phonograph, contacts adapted to close and open the motor circuit, a clock-operated arm, a pivoted extension thereof, a second arm controlling one of the contacts, connections for lifting the second arm when the first arm is lifted, closing the contacts and motor operated means for additionally lifting the second arm to maintain the contacts and releasing the extension from clock operation.

13. In a speaking clock, a phonograph, a clock, a motor for operating the phonograph, contacts adapted to close and open the motor circuit, a clock-operated arm, a second arm initially controlled thereby to close the contacts and a motor-operated cam having a surface adapted to lift the second arm to maintain the connections and subsequently release the same after the first arm is free from the clock device.

14. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock-operated means for shifting the arm and motor-operated means for maintaining the arm in position during intended operation of the phonograph independently of the clock-operated means.

15. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for shifting the arm and a cam operated by the motor, engaging with the arm to additionally shift and maintain the arm in shifted position independently of the clock.

16. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for moving the arm to close the contacts and a cam operative to maintain the arm in position and intermittent motor-operated connections for turning the cam in proportion to the rotations of the phonograph.

17. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for moving the arm to close the contacts and a cam having a surface adapted to additionally move said arm and a dwell to maintain it in position independently of the clock and having a receding surface to permit quick opening of the contacts.

18. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for lifting the arm, a cam adapted to engage the arm to maintain the contacts in closed position, a ratchet wheel connected with the cam, and intermittent motor-operated latch mechanism for moving the wheel.

19. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for lifting the arm, a cam having a surface adapted to lift the arm and maintain the contacts in closed position, a ratchet wheel for the cam, a spring-retracted pivoted latch having a reversely turned spring end and a motor-driven pin engaging said end to operate the ratchet wheel through the latch.

20. In a speaking clock, a phonograph, a motor for operating the phonograph, a pair of contacts for closing the motor circuit, an arm carrying one of said contacts, clock means for lifting the arm, a double cam having duplicate surfaces adapted to engage the arm and maintain it in raised position and motor driving mechanism for the cam adapted to turn it a half revolution for each intended announcement from the phonograph.

21. In a speaking clock, a phonograph, a motor operating the phonograph, a pair of contacts adapted to close the motor circuit, a pair of movable arms carrying the contacts, clock means for lifting one of the arms to bring the contacts into engagement, spring retarding means for the arm and motor-operated cam means for additionally lifting the clock-lifted arm and for maintaining it in lifted position during the announcement of the phonograph.

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