

Feb. 16, 1926.

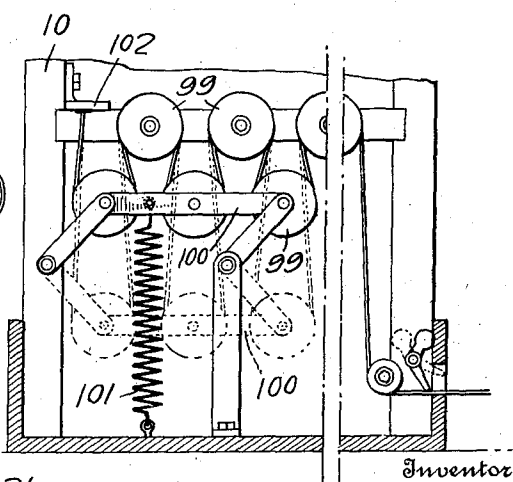
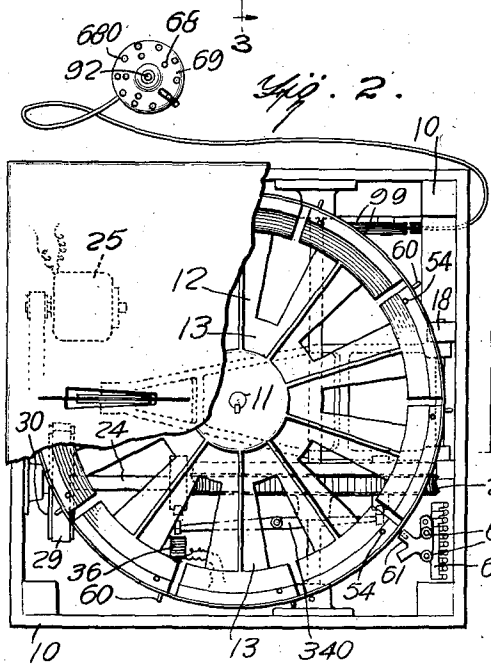
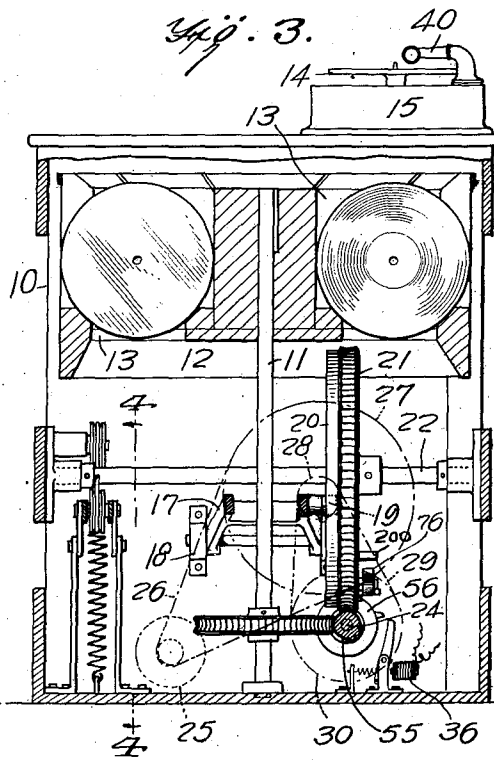
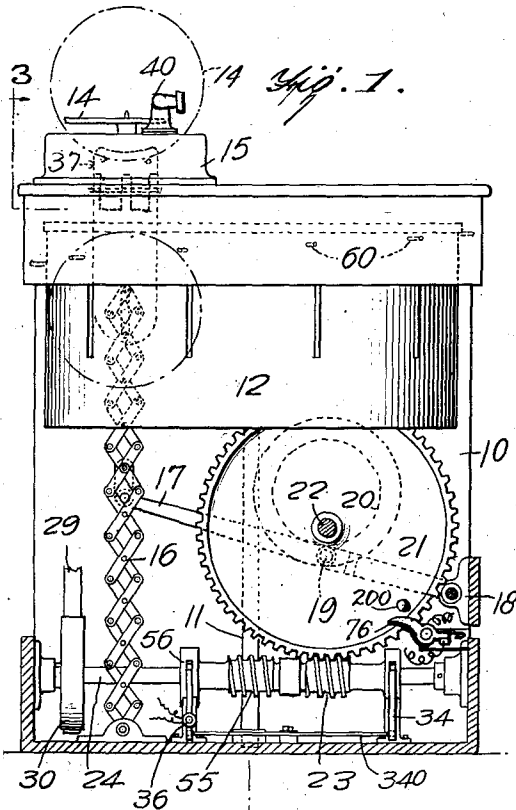
1,573,504

O. SMITH

AUTOMATIC PHONOGRAPH

Filed Dec. 29, 1921

3 Sheets-Sheet 1



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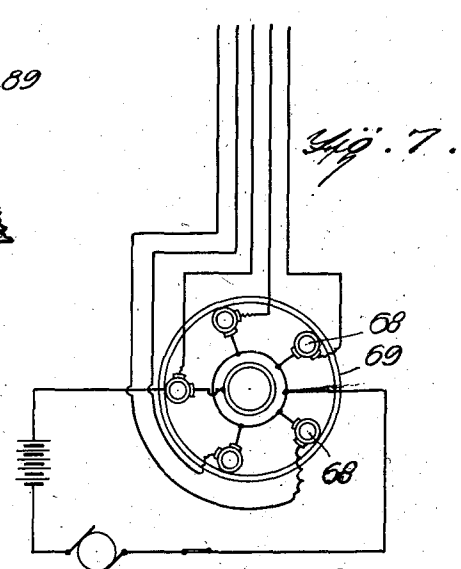
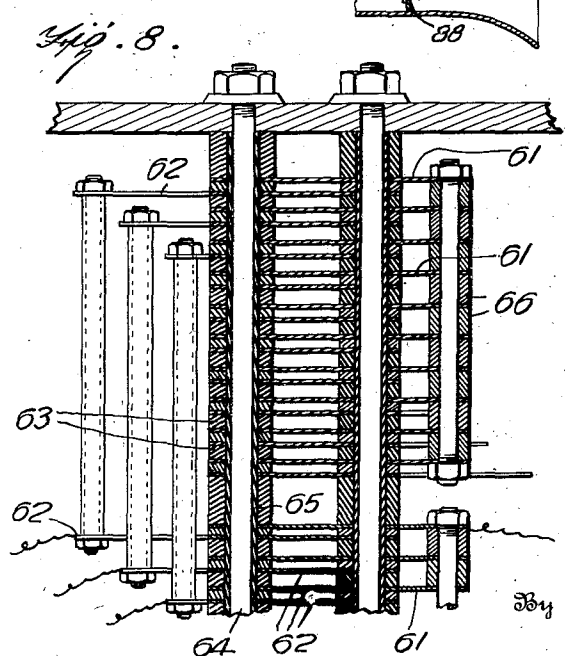
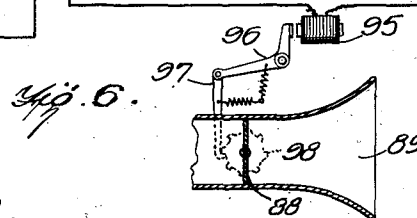
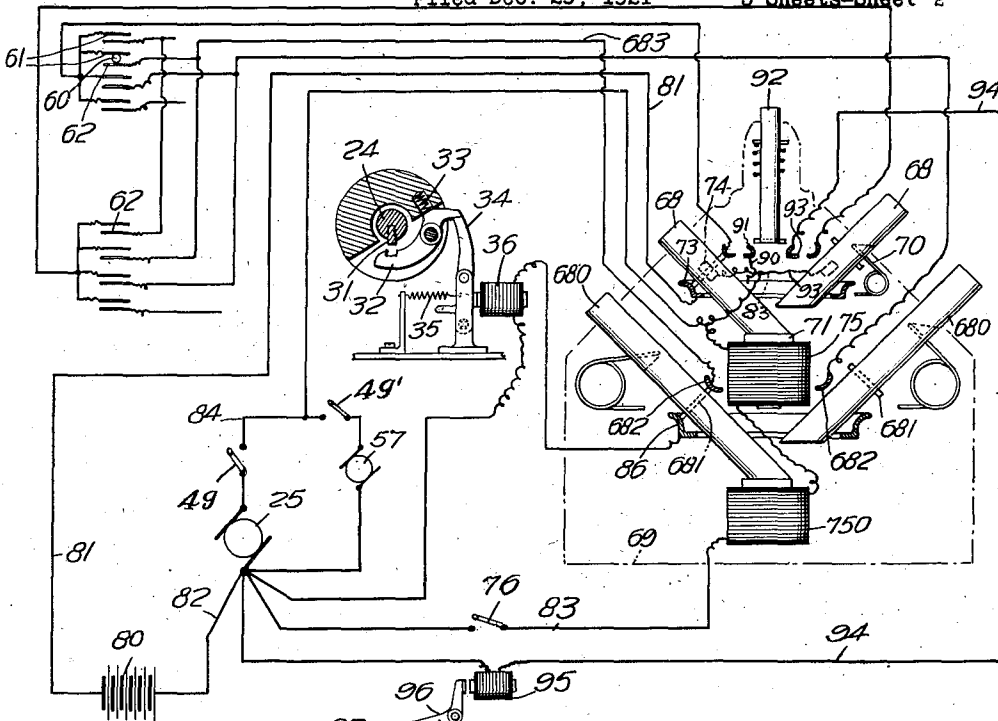
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3 Sheets-Sheet 2



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AUTOMATIC PHONOGRAPH

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3 Sheets-Sheet 3

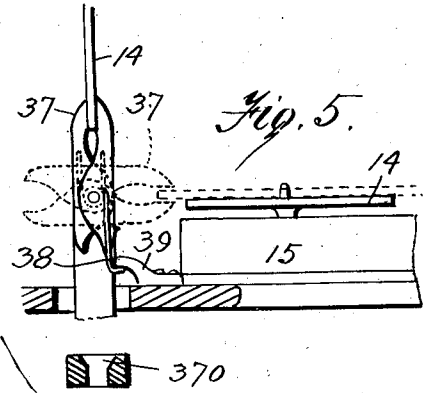
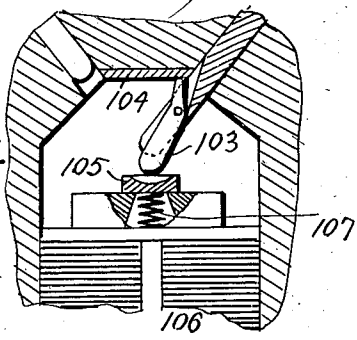
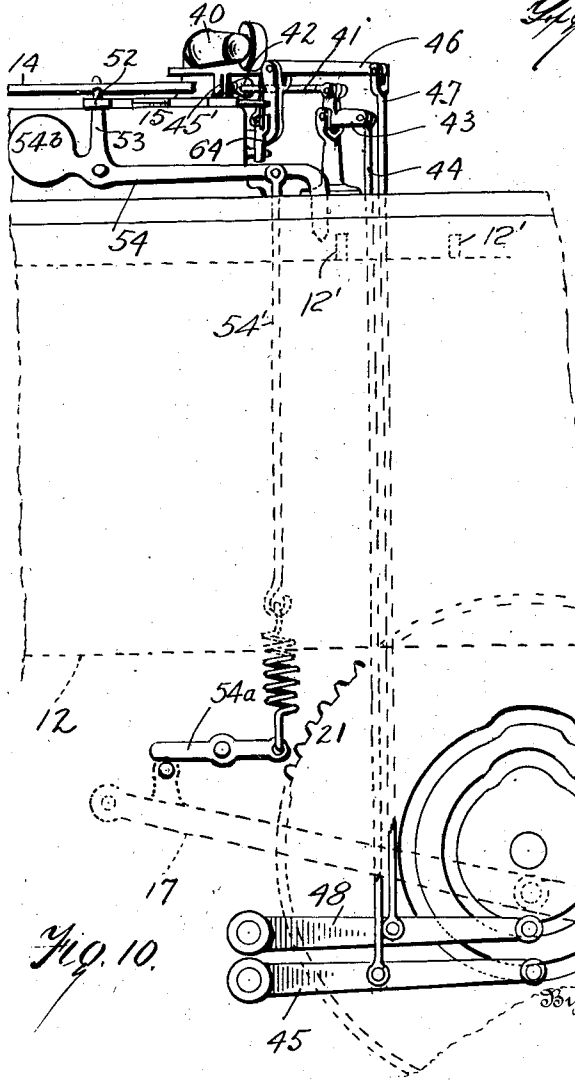
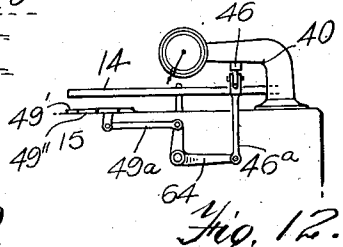
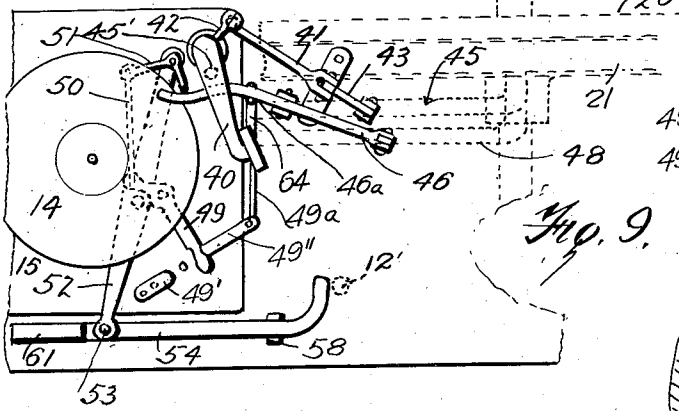


Fig. 10.

Fig. 9.

Fig. 12.

Fig. 11.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

OBERLIN SMITH, OF BRIDGETON, NEW JERSEY.

## AUTOMATIC PHONOGRAPH.

Application filed December 29, 1921. Serial No. 525,669.

*To all whom it may concern:*

Be it known that I, OBERLIN SMITH, residing at Bridgeton, in the county of Cumberland and State of New Jersey, a citizen of the United States, have invented certain new and useful Improvements in Automatic Phonographs, of which the following is a specification.

The main object of my invention is to reduce to the minimum the manual labor or effort required in the operation of phonographs and other instruments of entertainment presenting similar conditions in respect of applying and removing the operating member of the organization. Another object is to enable the application of the sound record or other operating member to and its removal from operating position by the manipulation of a controlling device, such as a keyboard, situated more or less remote from the instrument. A subsidiary but important object is to accomplish or achieve the other objects mentioned by mechanism that will be as simple as possible, having in view the operations to be performed. My invention consists in the mechanism having the characteristics of construction described by or included within the terms or scope of the appended claims.

I have embodied my invention in a phonograph of the disk-type, and the drawings will be found illustrating such an embodiment, but it is to be understood, unless the claims, by proper construction, restrict to or define such an embodiment, that the scope of my protection is not to be limited to the phonograph embodiment. Briefly described, the embodiment of my invention shown in the drawings comprises a phonograph using the disk-type record and, as usual, consisting of a turntable and a swinging tone-arm, a reservoir or magazine of turret form in which a large number of records are placed, power driven means for taking a record from the magazine, transporting it to and placing it upon the turntable and then removing it from the turntable and restoring it to its proper place in the magazine, and a keyboard comprising a collection of keys by whose manipulation the selection and removal of a desired record in the magazine is accomplished, the keyboard connection with the mechanism controlled thereby being electrical and thus the keyboard being

possible of location at any desired distance 55  
from the phonograph.

In the drawings—

Fig. 1 is a view in side elevation of an apparatus embodying my invention;

Fig. 2 is a top plan view, with parts broken away; 60

Fig. 3 is a vertical section on line 3—3, of Fig. 1;

Fig. 4 is a vertical section on line 4—4, of Fig. 3; 65

Fig. 5 is a detail view of the record transferring device, showing various positions thereof in a transfer operation;

Fig. 6 is a diagrammatic view illustrating the circuit arrangement, and a keyboard 70 mechanism that may be used;

Fig. 7 is a top plan view of the keyboard, diagrammatic in nature;

Fig. 8 is a detail view in vertical section of one of the switch groups; 75

Figs. 9 and 10 are detail views of the mechanism for governing the stopping of the turntable, and the mechanism for operating the tone-arm;

Fig. 11 is a detail view in section of a 80 different form of keyboard than is shown in the other figures.

Fig. 12 is a detail side view of a portion of the phonograph.

Referring to the drawings, a skeleton 85 framework, 10, is shown which may be made of wood and will preferably be enclosed by a cabinet of wood or other material within which on a vertical shaft, 11, is supported near the top of the framework a turret, 12, 90 which has a circular series of radially arranged compartments or stalls, 13, each adapted to contain and support a disk record that rests at its bottom edge upon ledges or racks at the bottom of the stall, a slot or 95 space being left between such supports for the entrance of the record transferring device by which a record is lifted out of the turret, placed upon the turntable, 14, of a phonograph, 15, and after the record has 100 been played returned to its proper stall.

The record transferring device which collectively I term the "lifter," comprises a pincer-like gripper mounted upon the upper end of a vertically sliding carrier, which 105 in its turn, is attached to a set of lazy-tongs, 16, attached to the bottom of the frame, 10, which at about mid-length is en-

gaged by the free end of a lever, 17, pivoted at its other end to a bracket, 18, attached to the frame so that it may swing vertically, and thus alternately open and close the lazy-tongs to lift and lower the gripper. Intermediate its end the lever, 17, has a roller, 19, that engages a path cam, 20, which cam may be simply a groove following an eccentric circle or other contour on the side of a disk attached to the worm wheel, 21, on a horizontal shaft, 22, driven by a worm, 23, on a horizontal main shaft, 24, that receives motion from a suitable motor, such as an electric motor, 25, which by suitable reduction gearing is geared to the main shaft, 24. As shown, the shaft of the motor, 25, has a pulley connected by a belt, 26, with a large pulley, 27, on a shaft, having a small pulley, 28, which in turn is connected by a belt, 29, with a large pulley, 30, on the main shaft, 24, but spur or worm or any other type of gearing may be used. The electric motor is in a circuit that includes a switch to control the running of the motor, and while the apparatus is in use the motor, and consequently the main shaft, are constantly running during the first and second sub-cycles of motion as explained later. The worm, 23, is loose on the main shaft, and is only revolved therewith when a clutch rotatably connects the worm and the main shaft. The clutch shown (Fig. 6) is of a type common in power presses and comprises a radial stud, 31, on shaft, 24, and a pawl, 32, pivoted in a flange at the end of the worm adjacent to the radial pin, 31, a spring, 33, acting upon the pawl, 32, normally to hold it in engagement with the pin, 31. A pivoted dog or catch, 34, is adapted to engage the tail of the pawl, 32, and disengage the pawl from the pin, 31, and thereby unclutch the worm from the main shaft, said catch being acted upon by a spring, 35, tending to move the catch away from and hold it in position out of the path of the tail of the pawl, 32, as the latter revolves with the worm. An electro-magnet, 36, acts upon the catch, 34, when the circuit including such magnet is closed to cause it to engage the pawl, 32, and release it from clutching engagement with the pin, 31. The worm, 23, is clutched to the main shaft, 24, to effect a revolution of the cam, 20, with the shaft, 22, a half revolution causing either the lifting or opening of the lazy-tongs or the lowering or contraction thereof, such movement of the lazy-tongs occurring, as has been explained, to place a given record upon the turntable, 14, and then, later on, to remove it therefrom.

The gripper comprises a pair of spring-closed jaws, 37, pivoted to each other and to the other end of the lazy-tongs, to one of which is attached a hook, 38, which as the grippers ascend gripping a record, at

its edge, engages a stationary projection, 39, with the result that the gripper is swung from the vertical position in which it first engages the record in its turret stall to a horizontal position to deposit the record on the turntable, 14, and then slightly opens the gripper jaws so that they will not have contact with the record as it revolves with the turntable, 14. When the playing of the record has finished and the lazy-tongs start to descend, the first effect is to free the hook, 38, from the projection, 39, and thus allow the gripper jaws to clamp the edge of the disk on the turntable, and the ensuing action is the reverse of that for depositing the record on the turntable. The gripper jaws are opened by the tails thereof entering a V-shaped opening, 370.

The phonograph tone-arm, 40, is mounted as usual so that it may swing horizontally to place the needle in contact with the record groove and allow the travel of the needle radially of the record, and to swing vertically to place the needle in the record groove and remove it therefrom. I effect the raising and lowering of the tone-arm and its lateral movement to place it in position for the needle to be dropped or lowered into engagement with the groove and lifted therefrom, by means of two devices that are actuated by appropriate cam grooves in the side of the worm wheel, 21. Referring to Figs. 9 and 10. The device for horizontally swinging the tone arm includes a link or rod, 41, at one end connected to a radial projection, 42, on the tone arm, and at its other end connected to one arm of a bell-crank lever, 43, whose other arm is connected to a link, 44, that extends to a lever, 45, which engages the proper cam in the side of the worm wheel, 21. The device that controls the lifting and lowering of the tone arm is a simple lever, 46, which at one end passes beneath the tone arm and at the other end is connected by a link, 47, with a lever, 48, that engages the appropriate cam in the side of the worm wheel, 21.

When the end of the record groove is reached and the piece on the record stops playing, I automatically stop the revolution of the phonograph turntable, and this I accomplish by a device that is actuated at the proper time by the turret, such proper time being that required for each record. As is well-known the stopping point of the playing grooves varies with different records, and hence the stopping of the turntable must be suited to the particular record being played. In the embodiment of my invention shown in the drawings, I use a stopping device that actuates a switch in the phonograph motor circuit and which is automatically adjustable to different positions so that it will actuate the switch device when the stylus or needle during the process

of playing, has reached the terminal of the record groove. The phonograph motor switch includes a lever, 49, pivoted beneath the turntable which by a light rod, 50, is connected to one arm of a bell crank lever, 51, pivoted to one extremity of a thin flat lever, 52, also pivoted beneath the turntable, and having its other extremity engaged by the finger, 53, of a lever, 54, pivoted to the side of the phonograph box so as to swing vertically. One end of the lever, 54, is adjacent the path of a series of pins, 12', on the top side of the turret, and when engaged by a pin, 12', the lever, 54, is rocked and thereby the end of the lever, 52, which carries the lever, 51, is moved to place the free arm of the lever, 51, nearer to or further from a projection, 45', carried by the tone arm. There is a pin, 12', for each record stall in the turret and the pins, 55, project from the turret a distance having a relation to the terminal point of the record groove of the record and the position to which the lever, 51, is shifted, by the movement of the lever, 52, depends upon the amount of projection of the pin, 12', above the turret. The pins, 12', are readily attached to and removed from the turret by providing the latter with holes into which the pins are inserted, and all the holes are of the same depth so that pins of different length will project different distances above the turret. The pins, 12', are of assorted lengths which, respectively, are equal to the distance radially between the outer turn of the record grooves and the innermost turn, and accordingly a pin having such length is placed in the hole in the turret at the stall having the record which suits the length of pin selected. Thus the free arm of the lever, 51, by the action of the pin appropriate to the record being played will be placed in a position relative to the tone arm projection, 45', that when the end of the record has been reached such projection, 45', will strike the lever, 51, and rock the same and thereby move the switch lever 49, to open the phonograph motor circuit. When the switch lever, 49, is thus moved to open the phonograph motor circuit, it also closes a circuit that includes a knife switch, 49', which controls the running of the main motor, 25, and the latter is thereby set in motion. The lever, 54, near its pin engaging end is connected by a yieldable connection, 54', consisting of a rod and a coil spring to one end of a lever, 54<sup>a</sup>, whose other end is in position to be engaged by the lifter lever, 17, or a part connected therewith when the lever, 17, is in record lifting position and thereby the end of the lever, 54, is placed and yieldingly held in position for engagement by a pin, 12'. The lever, 54, has a counterweight, 54<sup>b</sup>, that tends to lift the pin engaging end of the lever and thus ex-

cept when the lever, 54<sup>a</sup>, is engaged by the lifter lever, 17, no scraping action of the pins on the lever, 54, can take place. In place of the counterweight, a spring may be used for the same purpose.

At one side of the switch lever, 49, is an arm, 49'', which by a link, 49<sup>a</sup>, is connected with one arm of a bell crank lever, 64, pivoted to the side of the phonograph casing whose other arm is engaged by a push rod, 46<sup>a</sup>, on the underside of the tone arm lifting lever, 46, by the action of which parts the switch lever, 49, is caused to close the circuit through the main motor to start the same.

Power to rotate the turret is also taken from the driving shaft, 24, by a worm, 55, (Figs. 1 and 3) loose on the shaft, a clutch, 56, being provided to rotatably connect said worm with and disconnect it from the shaft similar to the clutch device for the cam driving worm, 23. When the magnet, 36, is energized by closing a switch in the circuit that includes such magnet, and thus releases the clutch, 56, the rotation of the turret will at once stop, but that does not occur until the stall containing the desired record is in position for such record to be engaged by the gripper of the record transferring device, whereupon the automatic closing of the circuit takes place and the magnet being energized, the catch of clutch, 56, is released and moved into the path of the clutch pawl and the latter is disengaged from the main shaft. The magnet, 36, is in a circuit which contains a normally open switch which includes a radial pin or stud, 60, on the periphery of the record carrying turret, and a pair of spaced spring blades, 61 and 62, insulated from one another between which said stud is forced by rotation of the turret, and thereby the circuit closed, the magnet energized, and the clutch, 56, disengaged. At the same time the turret rotating clutch is disengaged, the cam rotating clutch is engaged to start the lifter mechanism, this being accomplished by a lever connection 340, between the catch, 34, of the cam clutch, and the corresponding catch of clutch, 56. The switch consisting of the stud, 60, and a pair of blades, 61 and 62, is really a knife switch whose contacts are kept bright and in good conducting condition by rubbing together.

Should a lead wire be provided for each record, it will be seen that a great number of wires would be required, as many as fifty-one in an apparatus having fifty record stalls. To diminish greatly the number of wires I arrange the pairs of switch blades, 61 and 62, into groups, those of the same group being connected in parallel and thus having a common lead wire. Thus with fifty stalls it will be convenient to arrange the pairs of switch blades, 61 and 62, in

groups of ten. This group arrangement may be carried out as shown in the drawings (Figs. 6 and 8) by mounting the pair of blades, 61 and 62, properly insulated from each other by fibre washers, 63, in a vertical series upon a pair of vertical post-like supports, 64, said supports being insulated from the blades by a fibre tube or sleeve, 65. The studs, 60, are distributed vertically of the turret so that the studs will be properly positioned to engage the appropriate pair of blades, the result of this arrangement being that the studs, 60, extend in a spiral arrangement on the periphery of the turret. The circuit for each group of switch blades, 61, includes a manual switch, such as one of the push pin type, which controls the supply of the current to the circuit including the group and in addition to that switch, there is a switch for each set of lower blades, 62, which must manually be operated to supply current to a particular set of blades of each group so that in the operation of the apparatus, the proper group switch and the proper individual switch of that group must be operated to supply current only to that pair of blades which is related to the record that it is desired shall be taken from the turret and applied to the turntable. A suitable index card containing the names or titles of the records and the switch designations may be supplied with the apparatus by reference to which the proper keys to select a particular record for playing may be at once known. The upper blades, 61, of each group are spaced, but electrically connected by brass conducting washers, 66. The lower blades, 62, of each switch is connected by a brass conducting tube, 65, with the corresponding lower blade of each group so that if a push-button of the switches for the circuit that include the lower blades is depressed, it puts the lower switch blade of each switch group in a circuit containing the switch of that button. Thus it will be seen that pushing a button of the group of five buttons and one of the buttons of the other group would energize the two blades of only one switch, through which the current would pass when the proper pin or stud in the turret engaged such blades.

The keyboard may, as shown in Figs. 6 and 7, include a series of push-buttons, 68, (that constitute the group of five switches), slidably mounted each in a hole in a frame, 69, and yieldingly held outward in circuit breaking position by a coil spring, 70. Each key, 68, when pushed or depressed makes contact with the end of the core, 71, of an electro-magnet, 75, whose coils are in a circuit that includes a contact ring, 72, mounted on the key, 68, a stationary contact ring, 73, and a stationary clip, 74, connected by a wire, 83, with the magnet coil,

the magnet by the touching of said contacts when the key is pushed being energized, and the key is retained in its pushed or depressed position until the circuit is broken, which is done automatically as when the entire cycle is completed as explained hereafter. In order to prevent more than one key, 68, of a series being depressed at one time the inner ends of the keys pass through an imaginary center in the frame, 69, from which the key paths diverge, so that one depressed key will obstruct the movement of any of the other keys. The inner ends of the keys, 68, are beveled so that a key will have a flat surface in contact with the core, 71, of the electro-magnet, 75, when depressed or pushed in. Said keyboard also includes a series of push-buttons, 680, similar to the buttons, 68, that constitute the other group, that contact with the core of a magnet, 750, connected in series with the magnet, 75.

The electrical circuit may best be understood by referring to Fig. 6. The source of current taken into the machine is designated 80. From the source, 80, one wire, 81, is connected directly to the contact ring, 73, and the other wire, 82, runs to the motor, 25. In pushing a button, 68, the current is transmitted by means of the conducting ring, 72, on said button, and the clip, 74, touched by said ring, from which a wire leads to one of the groups of blades of the turret switches. At the same time current is transmitted by clip, 74, and wire, 83, that leads to the two magnets, 75 and 750, through switch, 76, controlled by cam, 20, and back to the source, 80, thus completing a circuit through the magnets causing said button, 68, to remain depressed by the action of the magnet, 75. Attached to wire, 83, and in parallel with magnets, 75, is a wire, 84, supplying current through tone-arm operated switch, 85, (which in its normal position is closed), to the motor, 25; and the motor circuit being energized and revolving shaft, 24, which, being normally clutched to the worm, 55, causes the turret, 12, to revolve. As before explained, in order to stop the turret, 12, at its proper position for a record it will be necessary for the clutch-magnet, 36, to be energized; thus causing the dog, of clutch, 56, to engage with the tail of the pawl thereof and disconnect the worm from the shaft.

Each of the push buttons, 680, has a ring-form contact, 681, which, when the button is pushed in, as shown in Fig. 6, will touch a contact ring, 86, from which a wire leads that includes the coil of the clutch-operating magnet, 36, and which also touches a clip, 682, from which a wire, 683, leads to the contact blades, 62, of one of the groups thereof. The push-button, 680, will be held in its depressed position by the attraction

of the magnet, 750, which is energized, because at the same time one of the push-buttons, 68, is in its depressed position. Under the conditions just set forth, when the turret 5 revolves until the appropriate stud or pin, 60, contacts with a pair of blades, 61 and 62, that are energized by reason of the depressed position of push-button, 68, and 680, the magnet, 36, will be energized, and the 10 clutch catch adjacent the magnet will be moved to operate the clutch, 56, to disconnect the turret from the driving shaft and thus stop the turret. It will be understood that when any two buttons, 68 and 680, are 15 pushed, the effect is to close the circuit through the motor so that it at once starts running and energizes both blades, 61 and 62, of a pair of the turret-controlled switch which represent the records selected to be 20 played.

The turret-clutch, 65 (Fig. 1), when disengaged, (being, as before explained, mechanically attached to the cam clutch), automatically causes the cam-clutch to clutch the 25 cam to the driving shaft, and thus operates the lifter to put the record on the turntable and place the tone-arm in position on the record thereby automatically closing the turntable motor switch, 49', and opening the 30 main motor switch, 49, thus stopping the motor, 25, (and incidentally the cam), and revolving the turntable, 14. It is to be remembered that at this time the cam clutch is still engaged, the turret clutch, 56, is disengaged, and the buttons, 68 and 680, are 35 depressed. The tone-arm, in being carried toward the center of the record when the record finishes playing, automatically closes the switch, 85, and opens the switch, 87, 40 thus starting the main motor, 25, which is controlled by the switch, 85, and stopping the phonograph motor, 57, which is controlled by the switch, 87.

By the action of the cam, 20, the tone-arm 45 is returned to its normal position and the lifter actuated to replace the record in its proper stall or compartment. At this time, by means of a projection, 200, on the cam, the switch, 76, is opened for an instant 50 breaking the circuits of the magnets, 75, and 750, which instantly allows the buttons, 68 and 680, to return to their normal position by their springs and break the entire circuit, allowing turret clutch, 56, to en- 55 gage and the cam clutch to disengage, putting them in their proper position for the next cycle. By its momentum, the cam, 20, passes the switch, 76, which immediately closes, thus putting the circuit at that point 60 in readiness for the next cycle. Should it be desired to repeat the last played record, instead of the turret making a complete revolution, it would not move. This is due to the fact that the acting radial pin, 60, on 65 the turret, 12, would be left between its

proper switch blades when the entire cycle was completed. As soon as the two buttons representing the record to be repeated are depressed, the circuit including the clutch magnet, 36, is closed, energizing the magnet and disengaging the turret clutch, 56, so that the turret remains in the position in which it was last used. In disengaging the turret clutch, the cam clutch is automatically 75 thrown in, clutching the worm, 23, to the cam and starting it on its regular cycle, just the same as if the turret had revolved until the pin representing the chosen record had come to place.

Current supplied the machine may be used 80 to operate a tone-damper, 88 (Fig. 6), contained in the horn, 89, by a suitable switch on the keyboard. Thus a wire, 90, may lead from the contact ring, 73, to a contact clip, 91, adapted to be engaged by a push 85 button, 92, that also engages a contact clip, 93, from which a wire, 94, leads to a magnet, 95, in a circuit completed through a connection on the motor, 25, to the source of current, 80. The magnet armature is a bell 90 crank lever, 96, that vibrates so that a pawl, 97, on said lever revolves one notch, a ratchet wheel, 98, attached to the damper, 88, and thus partially moves the latter and 95 so regulates the tone of the music. If the ratchet contained twelve notches it would be necessary to push the button only three times to entirely open or close the damper.

The conducting wires may be of the ordinary design having a cylindrical form and 100 containing the requisite number of insulated wires. If the relative positions of the machine and the keyboard are permanent, or reasonably so, this cable may be run beneath the floor or wall or may be run in any other 105 convenient way. If, however, it is desirable to have the keyboard portable so that it may be carried to another part of the room or to an adjoining room or to the side of a bed or a lounge, it is desirable to 110 have a flat, ribbon-like, very flexible cable with the wires running all side by side. Not only are these wires easier to connect and keep account of individually than in a round 115 cable, but the ribbon being very thin can lie against a wall or upon the floor or pass under a door without taking up too much room. It can furthermore be easily shortened or lengthened as the keyboard is carried from place to place without moving 120 the machine itself.

In Fig. 4 is shown such a flat cable running over several loosely running drums or idler pulleys, 99, placed in such a position 125 that some of them remain in a straight row while others are in another row, alternating in position, and mounted upon a movable bar, 100, to move up and down, (or sidewise if preferred). In this case said bar is 130 hinged like one edge of a parallel ruler and



pulled down by a spring, 101. The inner end of the cable is shown attached to a bracket, 102, holding the switches, etc., and the other end runs out from the machine through a slot and is controlled thereat against being pulled in again by a little friction pulley, or perhaps by the weight of the keyboard itself to keep it from slipping. This device therefore arranges for taking up the slack, so to speak, of several feet of cable, making it convenient to move the keyboard to various positions around the room, etc., without annoyance from slack.

The action of the machine may be divided into groups of sub-cycles, all of them together forming one grand cycle of the machine for its whole performance upon any one disk record.

The first of these sub-cycles selects and places in lifting position, by means of the turret, the disk in question. The second sub-cycle, without stopping the motor, lifts the disk and places it upon the turntable. The third sub-cycle, (the motor being stopped so as not to waste current and not to make any noise), performs the function of the phonograph proper. The fourth sub-cycle undoes the work of the second one, gripping, tipping, lowering and ungripping the record, leaving it in its proper stall and stopping the motor.

Assuming that this machine having a capacity for fifty records and running it at a conservatively low speed, the first cycle will require anywhere from one to fifty seconds of time according to how far the desired record is around the turret from the position in which the latter has happened to stop, which is the number of the previous record that happened to be played at that time. The second cycle will require sixty seconds, the third one from three to five minutes according to the amount of music or other sounds upon the particular record in play, while the fourth cycle will require sixty seconds. All of this is based on sixty revolutions per minute for the main clutch shaft. It is probable, however, that the machine may, to good advantage, be run at a much higher speed.

It will be understood that both in the organization of the apparatus as an entirety and in regard to the form or construction of the various elements or members, there may be departure or variations from what I have thus far described. Instead of having the push-key the armature of the magnet for holding the keys depressed, each key may, as shown in Fig. 11, have pivoted to it a latch, 103, which when the push-button is depressed swings into engagement with the underside of a plate, 104. In the path of each button as it is depressed is a plunger, 105, that forms the armature of the magnet, 106, which armature is pushed into the range of attraction of the magnet so that it is held

thereby against the upward force of a spring, 107, the magnet being energized when any push button is thus depressed. When the magnet circuit is broken temporarily as under the conditions hereinbefore described in connection with the other form of push-button holding means, the spring, 107, moves the plunger, 106, so that it strikes the tail of the latch 103, with enough force to release it from the latch plate and thus permit the depressed key to return to its normal position.

What I claim is:—

1. A machine of the kind described comprising player mechanism, a magazine for a collection of player devices, each device having its own appointed place in the magazine, a transfer device adapted to move a player device at a time from the magazine to the player mechanism and to return it to the magazine, a motor to move the magazine to present the player devices to the transfer device, and means including a member carried by the magazine for each player device that stops movement of the magazine with a selected player device at the point where the transfer device acts upon the player device.

2. In a machine of the kind described, the combination of a player mechanism that includes a turntable, a traveling magazine for a collection of player devices, a device to transfer selected player devices between magazine and player mechanism, to which the selected player device is presented by the traveling magazine, means under the control of the magazine which automatically causes it to stop with a selected player device at the transfer device, and automatic means for causing movement of the magazine and the transfer device.

3. In a machine of the kind described, the combination of a player mechanism that includes a turntable, a traveling magazine for a collection of player devices, a device to transfer selected player devices between magazine and player mechanism, to which the selected player device is presented by the traveling magazine, motor means operatively connected with the magazine and the transfer device, and hand-actuated means to set the motor means in operation, a circuit for each player device in the magazine that includes switch means adjacent the path of travel of the magazine and a device on the magazine for cooperating with each switch means, said magazine being a rotatable turret having radially arranged compartments to receive player devices.

4. In a machine of the kind described, the combination of a player mechanism that includes a turntable, a traveling magazine for a collection of player devices, a device to transfer selected player devices between magazine and player mechanism, to which

the selected player device is presented by the traveling magazine, motor means operatively connected with the magazine and the transfer device, hand-actuated means to set

5 the motor means in operation, and automatic means to stop the operation of the motor means comprising separate, alternately acting clutches for the magazine and the transfer device.

10 5. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of player devices, means to transfer selected devices one at a time between the magazine and the

15 player mechanism, and means under the control of the magazine to stop the travel thereof with reference to said transfer device, said magazine being a rotatable turret and said control means being projections

20 from the exterior of the turret.

6. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of player devices, electric means, including switches for

25 controlling the movement of said magazine, and means to transfer selected devices, one at a time, between the magazine and the player mechanism, said magazine being a rotatable turret that has projections that

30 constitute members of said switches.

7. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of player devices, electric means for controlling the

35 movement of said magazine including a switch that comprises a plurality of stationary members and a plurality of members to co-act therewith, carried by the magazine, and means to transfer selected devices,

40 one at a time, between the player mechanism and the magazine.

8. The combination of a player mechanism, a traveling magazine for a collection of player devices, consisting of a rotatable

45 turret having radial compartments for said devices, movable to present the respective devices at a point for removal, and automatic means to selectively stop said magazine at such point, to present a desired player

50 device thereat comprising a circuit for each player device in the magazine and a switch for each circuit adjacent the path of travel of the magazine, and a switch operating member on the magazine for each switch.

9. The combination of a player mechanism, a traveling magazine for a collection of player devices, consisting of a rotatable

55 turret having radial compartments for said devices, movable to present the respective devices at a point for removal, and automatic means to selectively stop said magazine at such point, to present a desired player

60 device thereat, said means being under the control of the magazine, and comprising a circuit for each player device including

switch members supported adjacent the periphery of the turret and radial pins on the periphery of the turret to coact with said switch members.

10. The combination of a player mechanism, a traveling magazine for a collection of player devices, consisting of a rotatable turret having radial compartments for said devices, movable to present the respective

70 devices at a point for removal, and automatic means to selectively stop said magazine at such point, to present a desired player device thereat, said means including series of switch contacts parallel with the turret axis and adjacent the periphery of the turret,

80 and radial projections on the periphery of the turret extending in a spiral direction around the turret.

11. In a machine of the kind described, the combination of player mechanism, a turret having separated holders for a collection of player devices, means to transfer one of

85 said devices at a time between player mechanism and turret, and automatic means to rotate the turret and selectively present desired player devices to said transfer mechanism.

12. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of

95 player devices, the magazine having containers for the respective player devices, each particular player device being removable from and returnable to its own place, a transfer device for moving a player device at a time between the magazine and the player mechanism, the movement of the magazine being to present the various

100 player devices to the transfer device, and automatic means to cause the stoppage of the magazine to present a selected player device to the transfer device comprising pins projecting from the magazine corresponding in number to the player devices

110 carried by the magazine and circuits having switches adjacent the path of travel of the magazine and engageable by said pins.

13. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of player

115 devices, the magazine having containers for the respective player devices, each particular player device being removable from and returnable to its own place, a transfer device for moving a player device at a time

120 between the magazine and the player mechanism, the movement of the magazine being to present the various player devices to the transfer device, and automatic means to cause the stoppage of the magazine to present a selected player device to the trans-

125 fer device, said automatic means comprising a motor to impart movement to the magazine and a motor stopping device on the magazine for each player device.

14. In a machine of the kind described, the combination of player mechanism, a traveling magazine for a collection of player devices, the magazine having containers for the respective player devices, each particular player device being removable from and returnable to its own place, a transfer device for moving a player device at a time between the magazine and the player mechanism, the movement of the magazine being to present the various player devices to the transfer device, and automatic means to cause the stoppage of the magazine to present a selected player device to the transfer device, said automatic means comprising an electric motor and switches to control the running of the motor that include for each player device a switch member carried by the magazine.
15. In a machine of the kind described, the combination of a player mechanism, a traveling magazine for a collection of player devices, a movable transfer device for moving selected player devices between the magazine and the player mechanism, motor means to move the magazine and to actuate the transfer device, and automatic means which prevent movement of the magazine when the transfer device is actuated and movement of the transfer device when the magazine is operated, said automatic means comprising control devices carried by the magazine and which are associated with the respective player devices.
16. In a machine of the kind described, the combination of a phonograph that includes a turntable and a movable tone arm, a traveling magazine for separately supporting a collection of records, a transfer device for carrying a record at a time between magazine and turntable, motor-operated means for moving the magazine, motor-operated means for actuating the transfer device, automatic means for causing movement of the magazine and actuation of the transfer device in alternation comprising members carried by the magazine for the respective records, and power operated means including cams and operative connections between the cams and the tone arm for moving the latter with reference to the turntable.
17. In a machine of the kind described, the combination of a phonograph that includes a turntable and a movable tone arm, a traveling magazine for separately supporting a collection of records, a transfer device for carrying a record at a time between magazine and turntable, motor operated means for moving the magazine, motor operated means for actuating the transfer device, automatic means for moving the magazine and actuating the transfer device in alternation comprising members carried by the magazine for the respective records, and power operated means including cams and operative connections between the cams and the tone arm for moving the latter with reference to the turntable, and record controlled means for simultaneously stopping the turntable and causing actuation of the transfer device.
18. The combination of a phonograph, a magazine of records, means to transfer records between magazine and phonograph, automatic means to stop the playing of the records actuated by respective records according to the length of the record, comprising projections on the magazine of a length related to the terminals of the respective records, and means to move the magazine.
19. The combination of a phonograph, a magazine of records, means to transfer records between magazine and phonograph, and automatic means to stop the playing of the records actuated by respective records according to the length of the record, comprising projections on the magazine of a length related to the terminals of the respective records, means to move the magazine, a tone arm projection and a movable member that is engaged by the tone arm projection, whose position for engagement is determined by said magazine projections.
20. The combination of a phonograph, a movable magazine of records, means to transfer a record at a time between phonograph and magazine, motor means that move the magazine and the transfer mechanism in timed alternation, and means whose action depends on the length of the sound-producing parts of the records to stop the phonograph and cause the motor means to actuate the transfer mechanism.
21. The combination of a phonograph, a movable magazine of records, means to transfer records between magazine and phonograph, motor means that move the magazine and the transfer mechanism, a keyboard that controls the delivery of power from the motor means, and automatic means that release set keys of the keyboard when the playing of a record on the phonograph ends.
22. The combination of player mechanism having a horizontal turntable, a traveling magazine having means to support a collection of player devices in vertical position in compartments that extend vertically through the magazine, and a vertically movable transfer device having a player device gripper movable between a vertical and a horizontal position and passing through a compartment when the latter aligns therewith.
23. The combination of player mechanism having a horizontal turntable, a traveling magazine having means to support a col-

lection of player devices in vertical position in compartments that extend vertically through the magazine, and a vertically movable transfer device having a player device gripper movable between a vertical and a horizontal position, and passing through a compartment when the latter aligns therewith, and means that open and close the gripper.

10 24. The combination of a player mechanism, a horizontally traveling magazine hav-

ing vertical spaces that respectively contain player devices, and having means to support such devices on edge in a vertical position, a transfer device that moves vertical through a space when alined therewith, and means to present such a space in alinement with the transfer device.

In testimony whereof I hereunto affix my signature.

OBERLIN SMITH.