

Nov. 22, 1949

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2,489,146

RECORD PLAYER WITH INCLINED TURNTABLE

Filed July 19, 1946

5 Sheets-Sheet 1

Fig. 1.

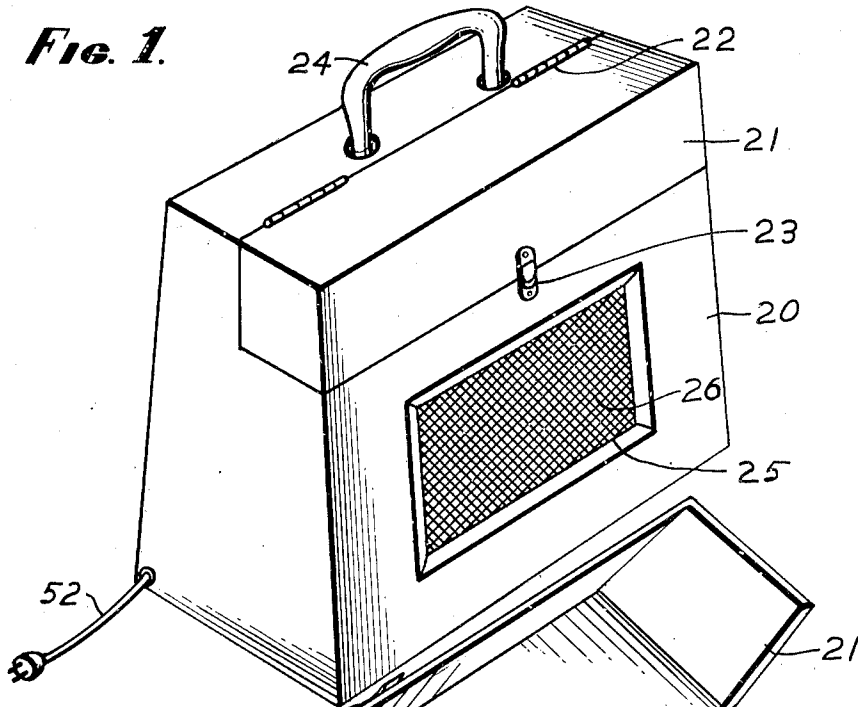
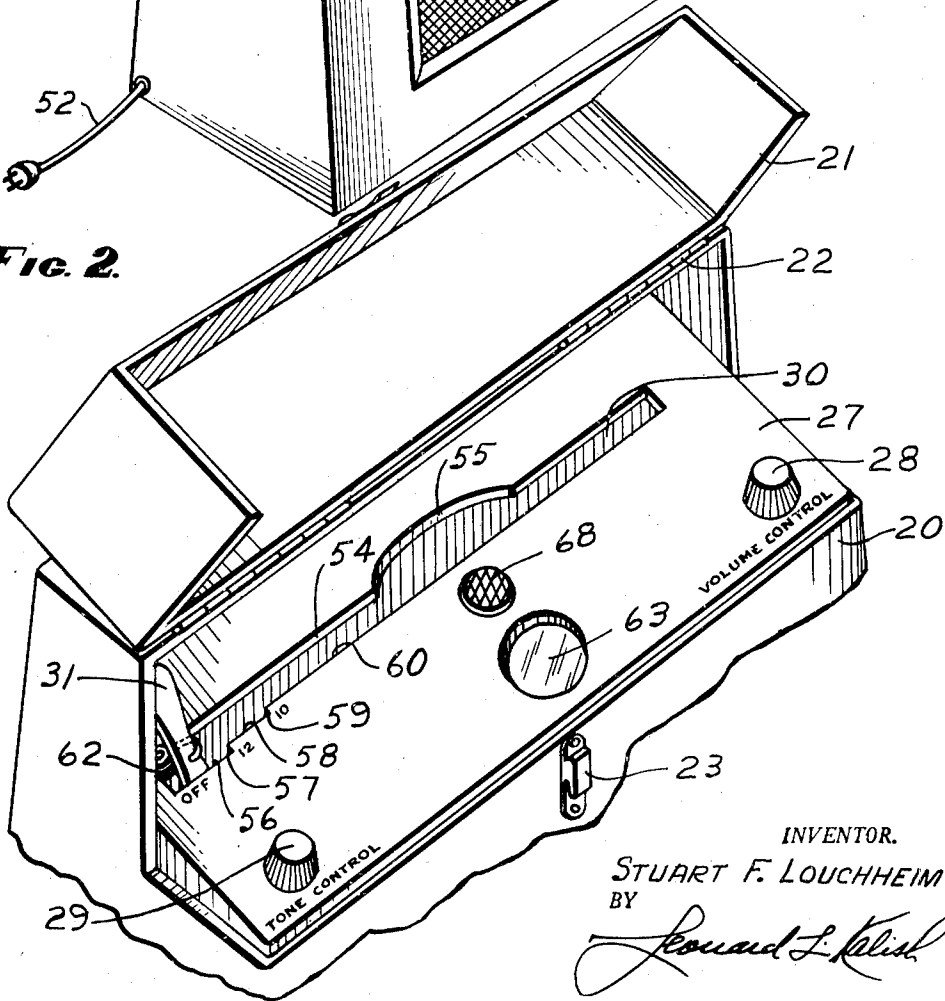


Fig. 2.



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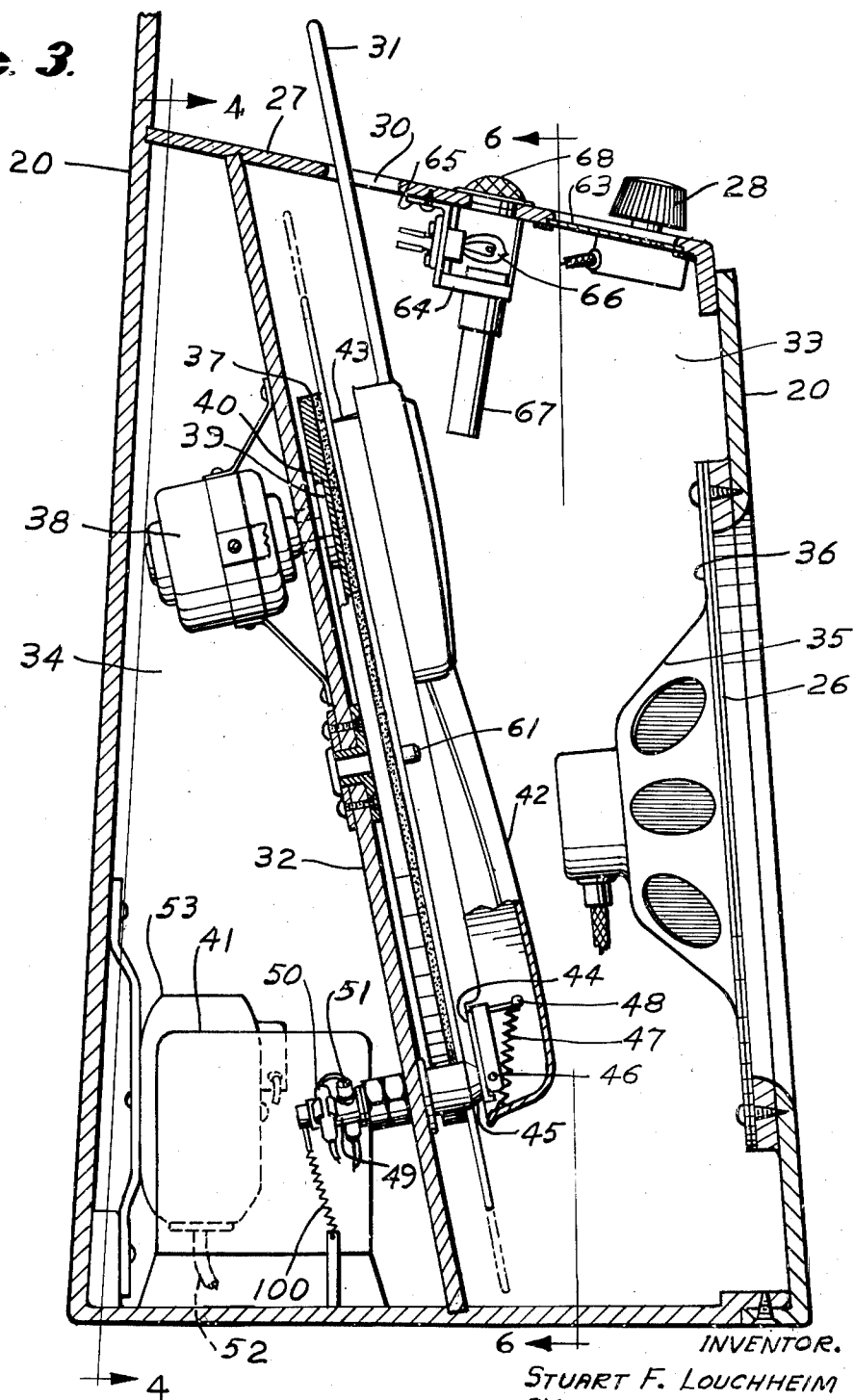
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FIG. 3.



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RECORD PLAYER WITH INCLINED TURNTABLE

Filed July 19, 1946

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FIG. 4.

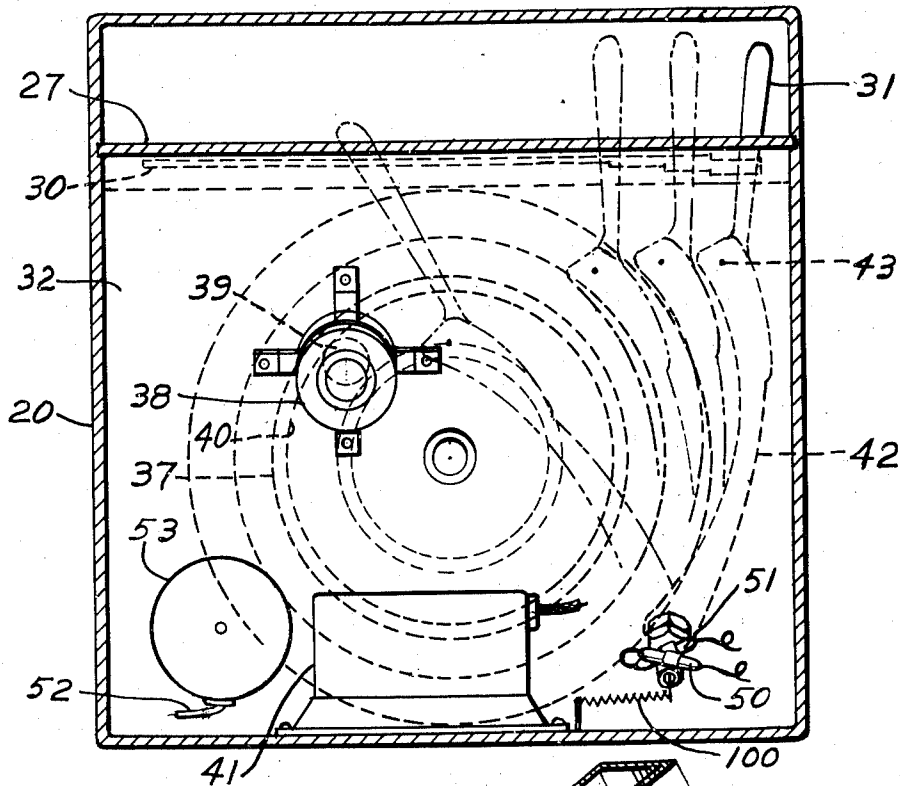
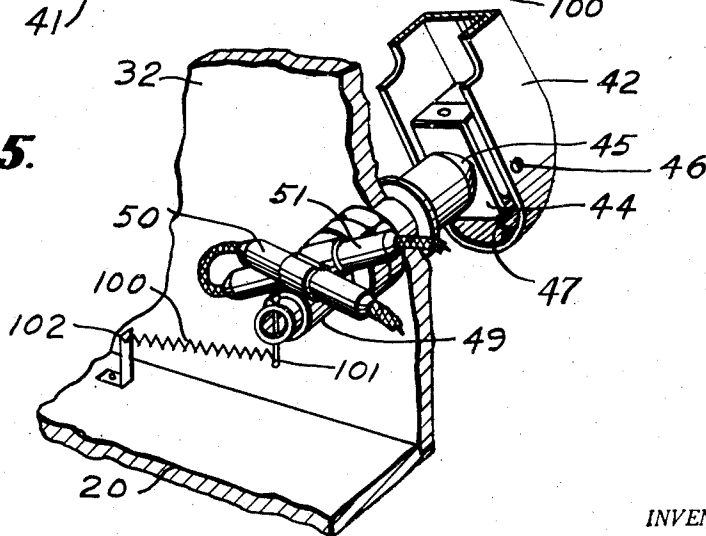


FIG. 5.



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Filed July 19, 1946

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FIG. 6.

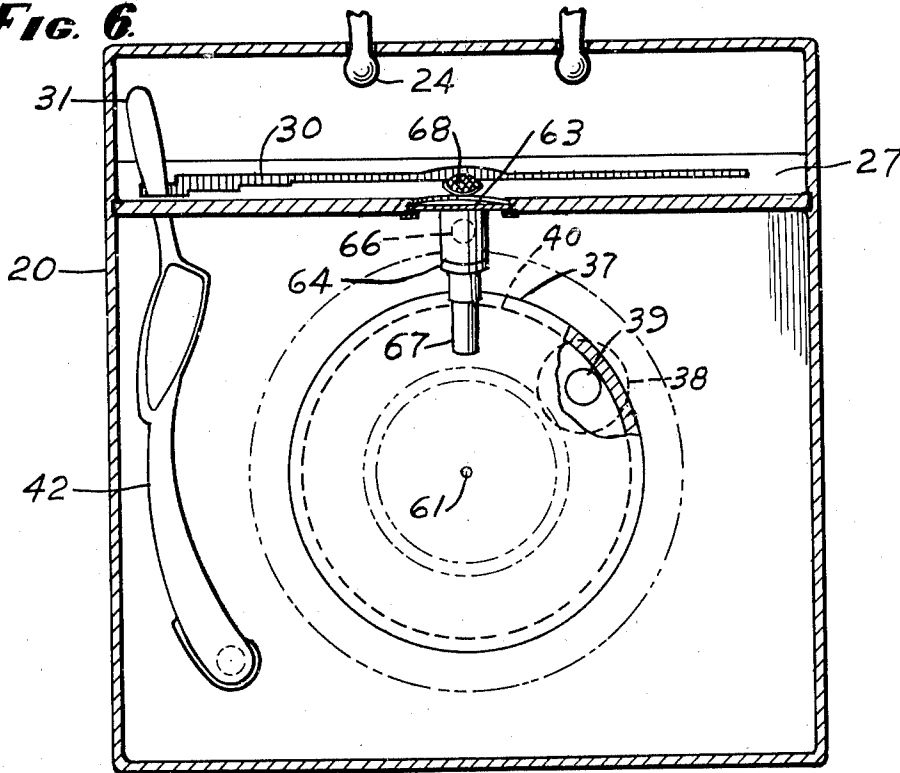
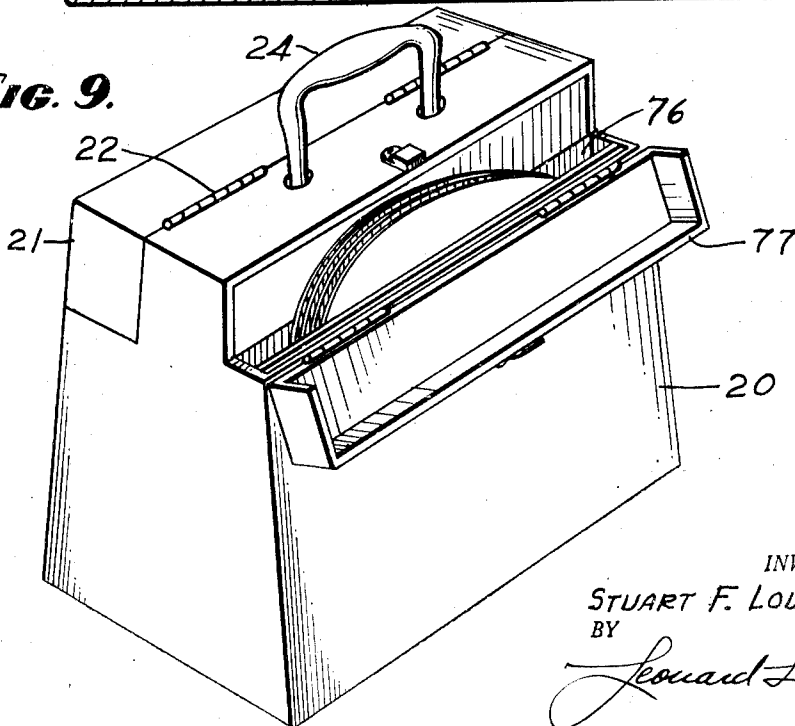


FIG. 9.



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RECORD PLAYER WITH INCLINED TURNTABLE

Filed July 19, 1946

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FIG. 7.

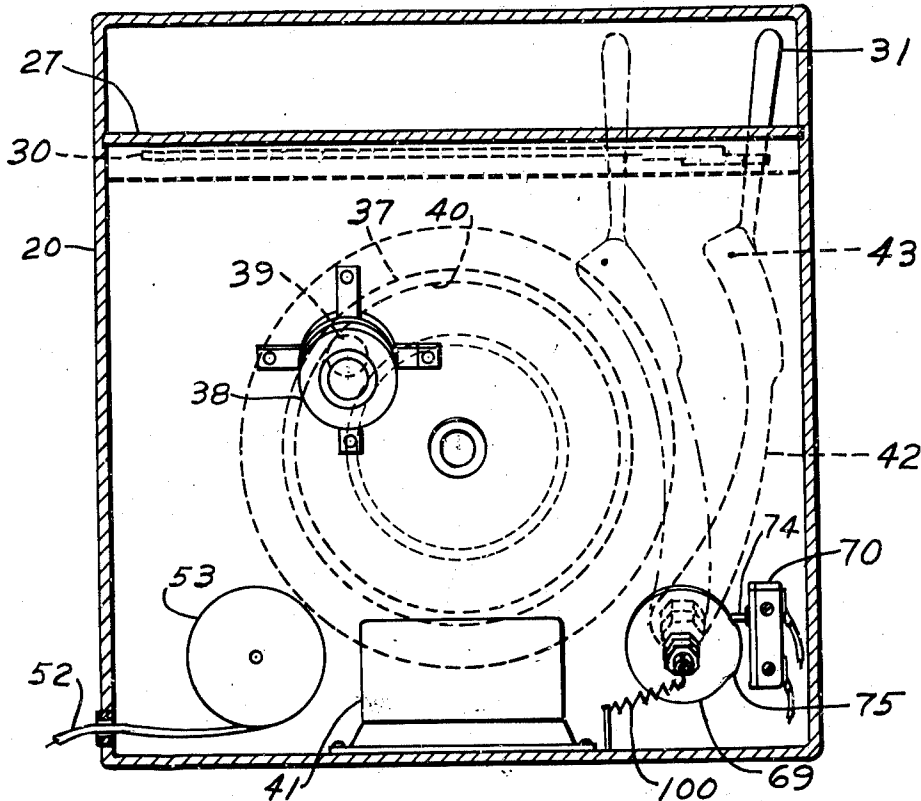
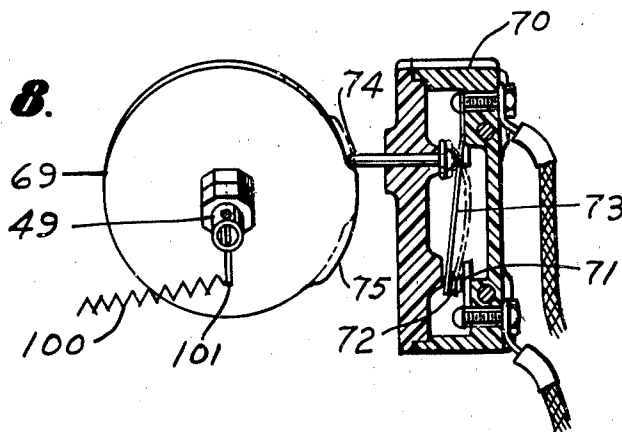


FIG. 8.



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UNITED STATES PATENT OFFICE

2,489,146

RECORD PLAYER WITH INCLINED
TURNTABLE

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Application July 19, 1946, Serial No. 684,922

5 Claims. (Cl. 274—2)

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The present invention relates to sound-producing instruments and it relates more particularly to electric phonographs or record-players or the like.

An object of the present invention is to provide a new and useful construction for sound-producing devices, phonographs, record-players and the like. Another object of the present invention is to provide an electrical record-player or the like which gives accurate and faithful reproduction, with a minimum of wear upon the records.

Still another object of the present invention is to provide an electrical record-player wherein the conventional flat disc-type records are disposed in generally vertical, slightly inclined position during play. A further object of the present invention is to provide an electrical record-player having new and improved construction whereby the turntable motor is shut off automatically when the play is completed and whereby the motor is turned on automatically when the pickup arm is moved to position to play either 10-inch or 12-inch records.

An additional object of the present invention is to provide a portable electric record-player or the like wherein conventional disc-type records are played in a generally upright manner whereby the pickup arm rests with only a minimum of weight upon the record so as to reduce record wear.

Still another object of the present invention is to provide a portable electric record-player or the like which is adapted to be carried by means of a handle on top and which is adapted to be used, during the playing of records, in generally the same upright position wherein it is carried.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

For the purpose of illustrating the invention, there are shown in the accompanying drawings forms thereof which are at present preferred, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Referring to the accompanying drawings in which like reference characters indicate like parts throughout:

Figure 1 represents a perspective view of one embodiment of the present invention as it appears with the lid closed.

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Figure 2 represents a fragmentary perspective view, on an enlarged scale, of the embodiment of Figure 1 but showing the lid open.

Figure 3 represents a vertical cross-sectional view of the embodiment of Figures 1 and 2.

Figure 4 represents a vertical cross-sectional view generally along the line 4—4 of Figure 3.

Figure 5 represents a perspective view, on an enlarged scale, of the automatic On-Off switch mechanism forming part of the embodiment of Figures 1-4.

Figure 6 represents a view looking generally along the line 6—6 of Figure 3.

Figure 7 represents a view generally similar to that of Figure 4 but showing another embodiment of the present invention.

Figure 8 represents an enlarged view of the cam-and-microswitch arrangement of Figure 7.

Figure 9 represents a fragmentary rear perspective view of still another embodiment of the present invention.

In one embodiment of the present invention, shown in Figure 1, I may provide a portable electric record-player or the like including a case or housing 20 having an upper lid or cover 21 hinged to the case 20 as at 22 and adapted to be locked in closed position by a snap-lock or clasp 23.

The case 20 may have a generally upwardly tapered contour. For example, the front-to-rear dimension at the bottom of the case may be of the order of 8½ inches while that at the top of the case may be of the order of 7 inches. By way of further example, the transverse dimension of the case may be 14½ inches while its height may be approximately 13 inches.

A carrying handle 24 is provided upon the top of the case 20; the handle 24 being hingedly connected to the case 20 or being adapted to recede within the case 20 (for example, by having its vertical end portions extend downward into the case) or being otherwise fastened so as not to interfere with the opening of the lid 21.

An opening 25 may be provided in the front wall of the case 20; a speaker grille 26 being mounted within the opening 25.

As shown particularly in Figure 2, a control panel 27 is mounted within the case or housing 20 adjacent the upper end thereof; the panel 27 sloping slightly upwardly from front to back.

Suitable controls are provided on the panel 27; as, for example, a volume control knob 28 and a tone control knob 29.

The panel 27 is provided with an elongated generally transversely extending slot, indicated generally by the reference character 30.

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An operating handle 31, to be described in detail hereinbelow, protrudes upwardly through the slot 30 from within the case 20.

As shown particularly in Figure 3, a partition wall 32 is disposed within the case 20, beneath the panel 27; the partition wall being tapered slightly rearwardly from bottom to top. For example, the partition wall 32 may be disposed at an angle of 70 degrees from the horizontal.

The partition wall 32 separates the inside of the case or housing 20 into a front compartment 33 and a back compartment 34; the front compartment tapering from top to bottom and the rear compartment tapering from bottom to top, as indicated in Figure 3.

A loud speaker 35 is mounted within the front compartment 33; the speaker 35 being provided with a peripheral baffle panel 36 which is adapted to be removably fastened to the front wall of the case 20 so that the speaker 35 is directly behind the grille 26.

A turntable 37 is mounted upon the wall 32, within the front compartment 33. The turntable 37 may be at generally the same angle as the partition wall 32. That is, the turntable may be inclined rearwardly at an angle of approximately 70 degrees from the horizontal.

A constant-speed motor 38 is mounted upon the opposite side of the partition wall 32 within the back compartment 34; the motor 38 being adapted to drive the turntable 37 through a conventional speed-reduction drive (not shown) and a conventional friction-drive wheel 39 which is spring-pressed against the inner periphery of the flange 40 of the turntable 37.

Mounted at the bottom of the back compartment 34 is a conventional electronic amplifying unit 41 which is adapted to receive and amplify the impulses from the tone-arm (to be herein-after described) and to transmit the so-amplified impulses to the speaker 35 in generally conventional manner.

A tone or pick-up arm 42 having a generally conventional crystal pick-up cartridge (not shown) and a needle 43 mounted at its free end, is pivotally mounted upon a base 44 which passes through and is fastened to the partition wall 32 somewhat below and off to the side of the turntable 37.

In addition to pivoting upon the axis 45, the tone-arm is tiltably mounted so that it is free to swing toward and away from the turntable 37 about the axis 46.

As indicated particularly in Figure 3, the tone-arm 42 generally parallels the turntable 37 (the free end of the tone-arm being above and slightly to the rear of its other end); the force of gravity tending to urge the free end of the tone-arm 42 toward the turntable 37 with only a slight force (due to the fact that the tone-arm 42 is inclined only slightly from the vertical).

In order to augment the force of gravity, a coil spring 47 may be connected intermediate the bottom end of the tone-arm 42 and a lug 48; the spring 47 tending to urge the free end of the tone-arm 42 in the direction of the turntable 37, as indicated particularly in Figure 3.

A shaft 49 extends through the base 44 and is adapted to rotate with the tone-arm 42.

As indicated particularly in Figures 4 and 5, a pair of mercury switches 50 and 51 are mounted upon the protruding portion of the shaft 49.

The mercury switches 50 and 51 are oppositely inclined relative to each other and are connected in series within the power circuit for the motor

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38; the switches 50 and 51 serving as an automatic "On-Off" control for the motor, as will be described hereinbelow.

An electric cord 52 extends from the case 20 and is adapted to be connected to any source of electric current so as to provide power for the motor 38 as well as for the amplifying unit 41.

The electric cord 52 may be provided with a conventional reel mechanism 53 disposed within the back compartment 34 to provide for extension and automatic spring-actuated retraction of the cord 52.

As shown particularly in Figures 3 and 6, the operating handle 31 is fastened rigidly to the free end of the tone-arm 42 and extends generally upward therefrom and, as stated above, protrudes through the slot 30.

It is obvious, therefore, that if the protruding portion of the operating handle 31 is manually moved from side to side relative to the slot 30, the tone-arm 42 will also be correspondingly moved. It is also apparent that, if the protruding portion of the operating handle 31 is moved from the front edge to the rear edge of the slot 30, the tone-arm 42 and its needle 43 will be moved toward the turntable 37 and vice versa.

The slot 30 includes back wall 54 which is slightly more than 12 inches in length so as to permit the insertion of 12-inch or 10-inch records through said slot. The back wall 54 is generally plane except for a central cut-out portion 55 which permits the fingers of the hand of the user to be inserted as an aid in inserting and removing records.

The back wall 54 may be formed at generally the same angle as the turntable 37, as shown particularly in Figure 3, so as to aid in guiding the record into proper position upon the turntable, as will be more fully described hereinbelow.

The front of the slot 30 is formed as a series of step-like walls which serve to guide the operating handle 31 in a manner to be hereinafter described.

Thus, the front of the left hand end of the slot 30 is formed as a short generally transverse wall 56. A shoulder 57 extends rearwardly generally at right angles from the wall 56 and terminates in a second transverse wall 58. A second shoulder 59 extends rearwardly generally at right angles from the other end of the wall 58 and terminates in a long transverse wall 60 which extends to the right hand end of the slot 30.

The first shoulder 57 is so positioned relative to the turntable 37 that, when the operating handle 31 is in contact with it, the needle 43 is in position to engage the peripheral starting edge of a 12-inch record. The second shoulder 59 is one inch to the right of the first shoulder 57, so that, when the operating handle 31 is against the shoulder 59, the needle 43 is in position to engage the peripheral starting edge of a 10-inch record.

Assuming that a record R has been inserted through the slot 30 so that its center hole fits over the spindle 61 of the turntable 37, it is apparent that if the operating handle 31 is moved to the right from its extreme left hand "rest" position shown in Figure 2 to the first shoulder 57 and if the handle 31 is then moved to the rear along and beyond the shoulder 57, the needle 43 will engage the starting edge of a 12-inch record.

If, instead, the record is a 10-inch one, it is apparent that a movement of the operating han-

dle 31, first to the right along the wall 56, then rearward along the shoulder 57, then to the right along the wall 58 and finally rearward along and beyond the shoulder 59 will cause the needle 43 to engage the starting edge of the 10-inch record.

In either case, the force of gravity and the spring 47 will maintain the tone-arm in the record-engaging position shown in Figure 3; the tone-arm moving on a generally vertical, slightly inclined arc during the playing of the record.

When the playing of the record has been completed, the operating handle 31 is moved forwardly until it strikes the transverse wall 60 (in which position, the needle 43 has been lifted from the record), whereupon the handle 31 is moved to the right along the walls 60, 59, 58, 57 and 56 to return it to its original or "rest" position.

In this rest position of the operating handle 31, the tone-arm 42 is maintained in forward position (away from the turntable 37) by a forwardly-positioned transverse wall 62 formed at the left hand end of the back wall 54.

It is also possible to provide any suitable friction catch or lock to prevent accidental dislodgement of the operating handle from its extreme left hand rest position.

While it is possible to provide for manually-controlled starting and stopping of the motor 38, it is preferred to provide means for automatically starting the motor (so as to rotate the turntable 37 and the record R) automatically upon movement of the operating handle 31 either to the 12-inch starting position or to the 10-inch starting position and to provide means for automatically shutting off the motor 38 when the play of the record has been completed.

This automatic "On-Off" mechanism includes the mercury switches 50 and 51 referred to hereinabove which are mounted upon the protruding portion of the shaft 39.

The series-connected mercury switches 50 and 51 are inclined slightly relative to each other, as shown particularly in Figures 4 and 5, and are so disposed that during the playing range of the tone-arm 42 (that is, the range from the starting position of a 12-inch record to just short of the end-of-play position) both switches will be sufficiently nearly horizontal to close the circuits between their end-electrodes in a manner well known in the art so that the electrical circuit to the motor 38 will be closed and the motor energized.

When, however, the tone-arm 42 is out of the normal playing range (that is, when it is either in the "rest" position or in the "end-of-play" position), one of the switches 50 and 51 will be tilted sufficiently from the horizontal to cause its mercury bead to shift so as to open the switch and to break the circuit to motor 38.

That is, when the tone-arm is in the "rest" position, the mercury switch 50 is tilted sufficiently to cause it to open so as to break the circuit to the motor 38. When, on the other hand, the tone-arm is in the "end-of-play" position, the other switch 51 is tilted sufficiently to open and to break the circuit to the motor 38.

It is apparent, therefore, that when the operating handle is in its left hand "rest" position, the motor 38 is stopped due to the fact that the switch 50 is open. When the handle 31 is moved to the first shoulder 57, the switch 50 is closed and the motor is started to begin rotation of the turntable 37. This same closing of the switch 50 occurs when the handle 31 is moved to the second shoulder 59, in the case of a 10-inch record.

During the play of the 10-inch or 12-inch record, both switches 50 and 51 remain closed so that the motor continues in operation. When, however, the "end-of-play" position is reached, the switch 51 is opened to stop the motor.

Thus, the motor shuts off automatically when the record is completed and thereby prevents injury to the record and to the needle due to continued operation after the record has been played.

When the handle 31 is manually lifted at its "end-of-play" position and the handle 31 is manually moved to the left to its initial "rest" position, the motor 38 is momentarily re-energized as both switches 50 and 51 are closed. This momentary re-energizing does not interfere with the resetting of the tone-arm, since during this operation, the needle 43 is raised free from the record R.

When the tone-arm 31 reaches its left hand "rest" position, the switch 50 is again opened so as again automatically to stop the motor 38.

As is evident from Figures 4 and 6, the tone-arm extends more nearly vertically (in the plane of its playing-arc) when it is at the "start-of-play" position than when it is in the end-of-play position. Thus, as the play of a record progresses, there is a progressive increase in the gravitational effect upon the tone-arm, tending to urge the tone-arm downwardly and inwardly across the playing surface of the record.

This tendency may, in some cases, become excessive as the playing arm approaches the end-of-play position. That is, the gravitational effect upon the tone-arm, when the latter is near the end-of-play position, may become sufficiently great to cause the needle to jump out of the playing groove and thereby to permit the tone-arm and the needle to move freely across the record so as to scratch the record and, perhaps, also to injure the needle and the tone-arm.

Moreover, should this gravitational effect become too great, there may be excessive wear upon that portion of the playing groove adjacent the end-of-play position and, in addition, there may be distortion of the tone due to excessive and uneven pressure on the playing groove.

Thus, it may be preferred to provide the tone-arm with spring-means adapted to exert a progressively greater pull upon the tone-arm so as to counteract the excessive gravitational effect at the end-of-play position.

As shown particularly in Figures 4 and 5, this spring-means may consist of a relatively weak coil spring 100 fastened at one end to the tone-arm shaft 39 as at 101 and anchored at its other end as at 102.

It is obvious that the spring 100 will exert little or no restraining force upon the tone-arm when the latter is adjacent its start-of-play position and that the restraining force will thereafter gradually increase as the tone-arm moves along its playing arc. By suitably adjusting the strength and spring 100 it is possible to regulate the restraining force so as just to counteract the increased gravitational effect and thereby to eliminate the undesirable results referred to above.

In order to aid in inserting a record, the present invention includes means permitting the user to observe the position of the spindle 61 of the turntable 37 so that the center hole of the record can be aligned with the spindle.

Thus, as shown particularly in Figures 3 and 6, the panel 27 is provided with a transparent win-

dow 63 which is so placed that the spindle 61 is visible therethrough.

In order to aid in the observation of the spindle and to indicate the spindle's position even when it is obscured by the lower portion of the record during insertion of said record, the present invention comprehends the inclusion of novel directional lighting means.

The lighting means includes a socket 64 which is fastened to the underside of the panel 27 by a bracket 65. Within the socket 64 is disposed a small electric light bulb 66 which is operatively connected to the volume control knob 28 so that it is turned on and off simultaneously with the amplifying unit 41.

Extending downward from the lower end of the socket 64 is an elongated rod 67 formed of a material which is adapted for edge-lighting upon the principle of total interior reflection. Among the materials having this property of conducting light upon the principle of total interior reflection are the synthetic plastics which are commercially available.

The ends of the rod 67 are polished so that light from the bulb 67 enters the upper end of said rod and is conducted internally therealong and emerges therefrom through the lower end, in the form of a beam which can readily be identified through the window 63.

At least the lower portion of the rod 67 is pointed toward the spindle 61 so that the beam of light forms a visible continuation from the lower end of the rod 67 to the tip of the spindle 61.

While, in Figures 3 and 6 the rod 67 is shown as being straight throughout, it is possible to provide one or more bends in said rod, if this is desirable for better observation of the spindle 61 through the window 63. That is, the materials which are capable of edge lighting upon the principle of total interior reflection, as aforesaid, are also capable of transmitting light around bends, in a manner well known in the art. Thus, light entering the upper end of the rod 67 will be substantially completely transmitted to the lower end of said rod, regardless of whether or not the rod contains one or more bends intermediate its ends.

While, as indicated above, substantially all of the light entering the upper end of the rod 67 emerges through the lower end of said rod with little transverse loss of light through the cylindrical surface of said rod, it is possible further to minimize such loss of light by coating the cylindrical surface of said rod 67 with an opaque material. In some instances it is preferred to employ as the opaque coating material, a substance capable of reflecting light; as, for example, a mirror-coating of silver.

In order to indicate when the light bulb 66 is on, a reflector "jewel" of colored facet-cut glass 68 is mounted within the panel 27; the jewel 68 being directly above and in line with the socket 64 so that it is illuminated by the bulb 66 through the upper open end of said socket 64.

During insertion of a record through the slot 30 the beam of light from the rod 67 is visible through the window 63, even when the spindle is covered by the lower portion of the rod. Thus, the user simply moves the record until its center hole comes into line with the beam of light at which time it will automatically align with the spindle 61 and drop into playing position upon the turntable 37.

Generally speaking, the present invention contemplates the provision of a turntable which is

generally upright (as compared to the conventional horizontal turntables heretofore employed) and which is inclined preferably at an angle greater than 45 degrees and less than 90 degrees. Preferably, the turntable of the present invention is inclined at an angle of about 60 to 80 degrees from the horizontal and, most preferably, at an angle of about 70 degrees from the horizontal.

As indicated above, it has been found that the provision of a generally upright turntable having a relatively small inclination from the vertical, along with a similarly inclined playing-position of the tone-arm, results in better reproduction and less wear upon the records; than is the case with conventional horizontal turntables.

In Figure 7 there is shown another embodiment of the present invention which generally resembles that described hereinabove except for the provision of a different-type automatic switch mechanism for the motor 38.

That is, in the embodiment of Figure 7, the mercury switches 50 and 51 are replaced by a cam-and-microswitch mechanism to be hereinafter described.

Thus, the shaft 49 which rotates with the tone-arm 42 as described above, is provided with a cam 69 and a microswitch 70 is disposed in operative juxtaposition to said cam 69.

The microswitch 70 is of conventional construction and includes a fixed contact 71 and a movable contact 72 carried at the free end of spring-arm 73 which is tensioned so as normally to retain the switch in open position and to maintain the slidably-mounted plunger in extended position.

The free end of the plunger 74 is in line with the cam 69 and is so disposed that it will be forced inward by the high-point 75 of the cam 69 during rotation of said cam so as to move the contact 72 against the contact 71 and thereby to close the microswitch 70 (which is connected in the power circuit of the motor 38) to energize the motor.

The cam 69 and the microswitch 70 are so arranged that, when the tone-arm 42 and the operating handle 31 are in the "rest" position: described above, the high-point 75 of the cam will be out of line with the plunger 74 so that the plunger will be in extended position wherein the switch is open.

When the operating handle is moved sufficiently to bring the tone-arm into position to play either a 12-inch record or a 10-inch record, the cam 69 is rotated so as to move its high-point 75 into line with the plunger 74 so as to force the plunger in and close the switch 70 and energize the motor. During movement of the tone-arm throughout the playing range of the record, the high-point 75 of the cam 69 remains in line with the plunger 74 so that the switch remains closed and the motor continues running. When, however, the tone-arm reaches the "end-of-play" position, the high-point 75 moves out of line with the plunger 74 whereby the switch 70 automatically opens to stop the motor 38.

When the operating handle 31 is manually lifted and moved toward the left for re-play, the switch 70 is momentarily closed and the motor 38 is momentarily re-started. However, when the operating handle reaches its "rest" position during this manual return, the switch again automatically opens so that the motor is stopped and does not re-start until the tone-arm is again

moved to position to start play of a 10-inch or 12-inch record.

It is apparent, therefore, that the microswitch 70 automatically closes the circuit to the motor 38 whenever the tone-arm 42 is in the record-playing range and automatically opens the circuit whenever the tone-arm is moved short of or beyond the record-playing range.

In Figure 9 there is shown another embodiment of the present invention, wherein a record-storage compartment 76 is provided adjacent the rear wall of the case 20. The compartment 76 is provided with an upper hinged lid 77 which can be opened to permit insertion and removal of records.

Inasmuch as the case 20 is always carried and played in the upright position, it is apparent that the stored records will always be maintained upright so as to minimize the danger of breaking or falling out.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described the present invention, I claim as new and desire to protect by Letters Patent:

1. In a portable record-player or the like, a generally upright housing having a supporting base-portion upon which the record-player is adapted to lie when in an operating position, a control panel formed adjacent the top of said housing, said panel having an elongated transverse slot formed therein, a rotatable turntable fully enclosed within said housing, said turntable being generally upright and being inclined at an angle of more than 45 degrees and less than 90 degrees to said supporting base-portion, and a movable tone-arm mounted within said housing in operative juxtaposition to said turntable, said elongated slot being disposed generally in alignment with said turntable whereby a disc-type record can be inserted through said slot and upon said turntable, said tone-arm being fully enclosed within said housing and being provided with an operating handle rigidly attached thereto and extending upward therefrom through said slot, for manual regulation of said tone-arm.

2. In a portable record-player or the like, a generally upright housing having a supporting base-portion upon which the record-player is adapted to lie when in an operating position, a control panel formed adjacent the top of said housing, said panel having an elongated transverse slot formed therein, a rotatable turntable fully enclosed within said housing, said turntable being generally upright and being inclined at an angle of more than 45 degrees and less than 90 degrees to said supporting base-portion, and a movable tone-arm mounted within said housing in operative juxtaposition to said turntable, said elongated slot being disposed generally in alignment with said turntable whereby a disc-type record can be inserted through said slot and upon said turntable, said tone-arm being fully enclosed within said housing and being provided with an operating handle rigidly attached thereto and extending upward therefrom through said slot, for manual regulation of said tone-arm, said slot being provided with a shoulder against which said operating handle is adapted to be moved so

as to position said tone-arm in start-of-play position.

3. In a portable record-player or the like, a generally upright housing having a supporting base-portion upon which the record-player is adapted to lie when in an operating position, a control panel formed adjacent the top of said housing, said panel having an elongated transverse slot formed therein, a rotatable turntable fully enclosed within said housing, said turntable being generally upright and being inclined at an angle of more than 45 degrees and less than 90 degrees to said supporting base-portion, and a movable tone-arm mounted within said housing in operative juxtaposition to said turntable, said elongated slot being disposed generally in alignment with said turntable whereby a disc-type record can be inserted through said slot and upon said turntable, said tone-arm being fully enclosed within said housing and being provided with an operating handle rigidly attached thereto and extending upward therefrom through said slot, for manual regulation of said tone-arm, said slot being provided with a plurality of spaced shoulders against which said operating handle can be moved so as to position said tone-arm in the start-of-play positions corresponding to different-size records.

4. In a portable record-player or the like, a generally upright housing having a supporting base-portion upon which the record-player is adapted to lie when in an operating position, a control panel formed adjacent the top of said housing, said panel having an elongated transverse slot formed therein, a rotatable turntable fully enclosed within said housing, said turntable being generally upright and being inclined at an angle of more than 45 degrees and less than 90 degrees to said supporting base-portion, a movable tone-arm mounted within said housing in operative juxtaposition to said turntable, said elongated slot being disposed generally in alignment with said turntable whereby a disc-type record can be inserted through said slot and upon said turntable, said operating panel being provided with a sight-opening, and a source of illumination mounted within the upper part of said housing and adapted to direct a beam of light upon said spindle, whereby said beam of light and said spindle can be observed through said sight-opening to aid in insertion of records.

5. In a portable record-player or the like, a generally upright housing having a supporting base-portion upon which the record-player is adapted to lie when in an operating position, a control panel formed adjacent the top of said housing, said panel having an elongated transverse slot formed therein, a rotatable turntable fully enclosed within said housing, said turntable being generally upright and being inclined at an angle of more than 45 degrees and less than 90 degrees to said supporting base-portion, a movable tone-arm mounted within said housing in operative juxtaposition to said turntable, said elongated slot being disposed generally in alignment with said turntable whereby a disc-type record can be inserted through said slot and upon said turntable, said operating panel being provided with a sight-opening, and a source of illumination mounted within the upper part of said housing and adapted to direct a beam of light upon said spindle, whereby said beam of light and said spindle can be observed through said sight-opening to aid in insertion of records, said source of illumination including a generally

enclosed electric light bulb and an elongated rod of synthetic plastic material capable of transmitting light upon the principle of total internal reflection, said rod having one of its ends disposed adjacent said bulb so as to receive light therefrom and having its other end pointing toward said spindle whereby light emerging therefrom is directed in a more or less compact beam upon said spindle.

STUART F. LOUCHHEIM.

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