R. A. BOSWELL.

CABINET TALKING MACHINE.

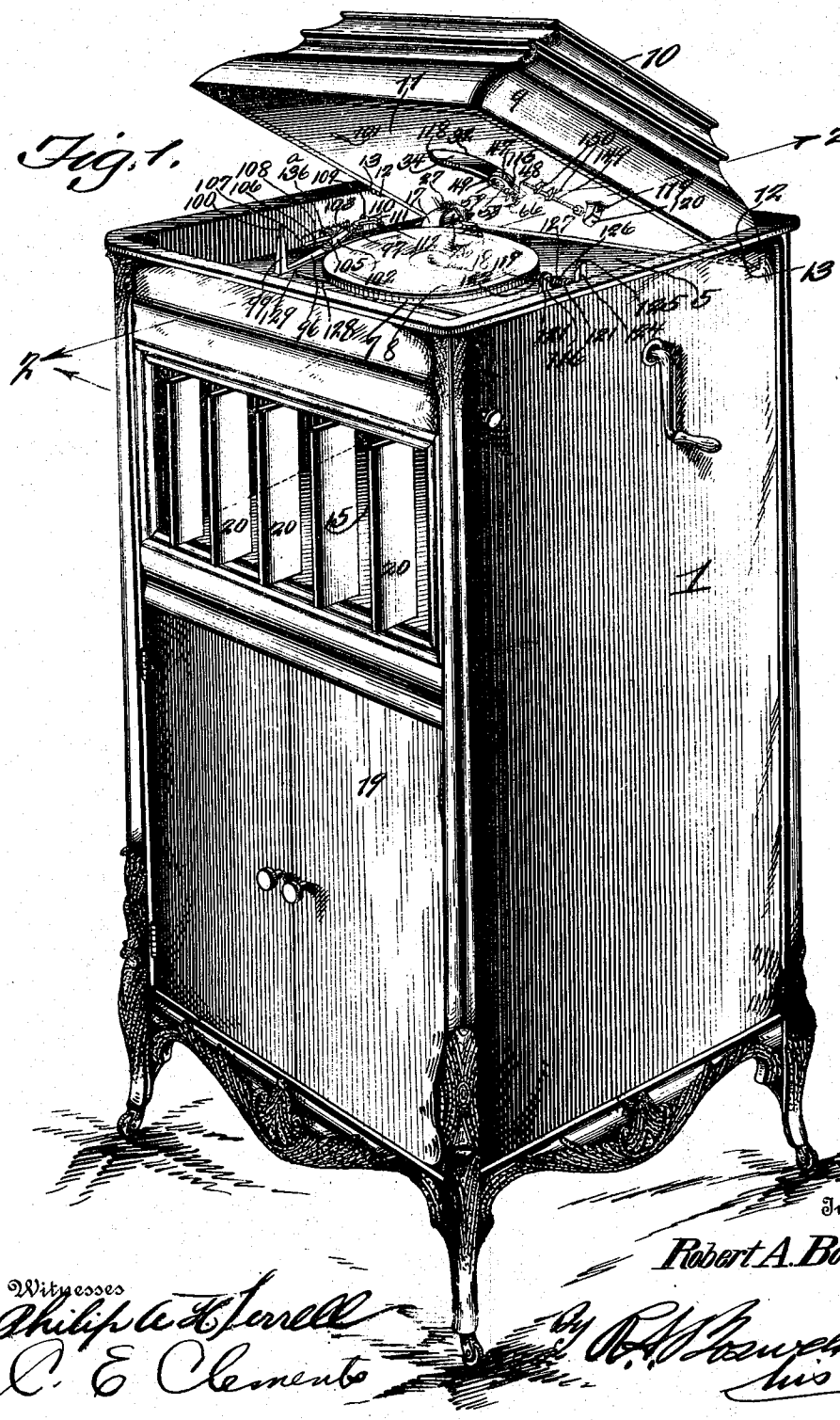
APPLICATION FILED SEPT. 4, 1917.

1,429,839.

Patented Sept. 19, 1922.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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5 SHEETS—SHEET 2.

Fig. 13.

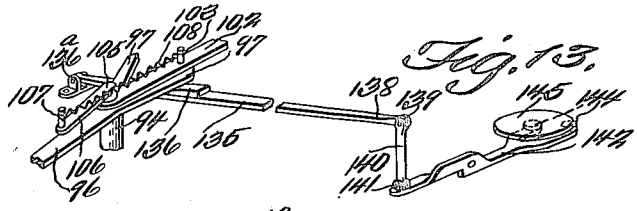
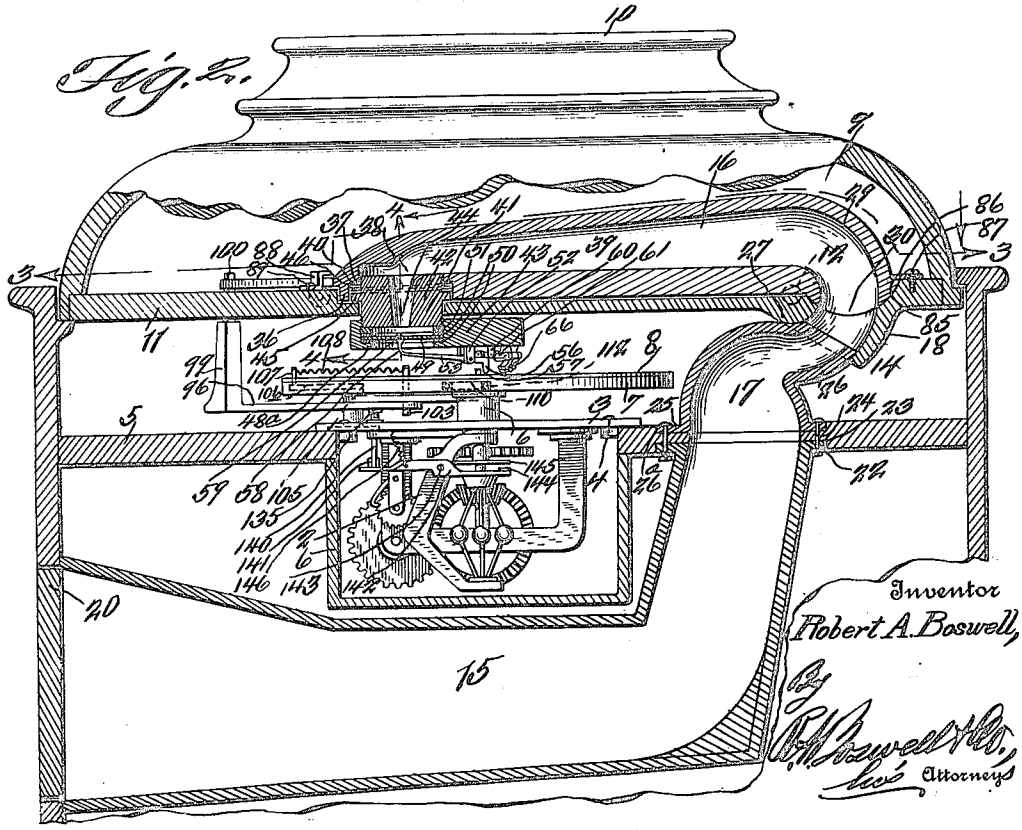


Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 3.

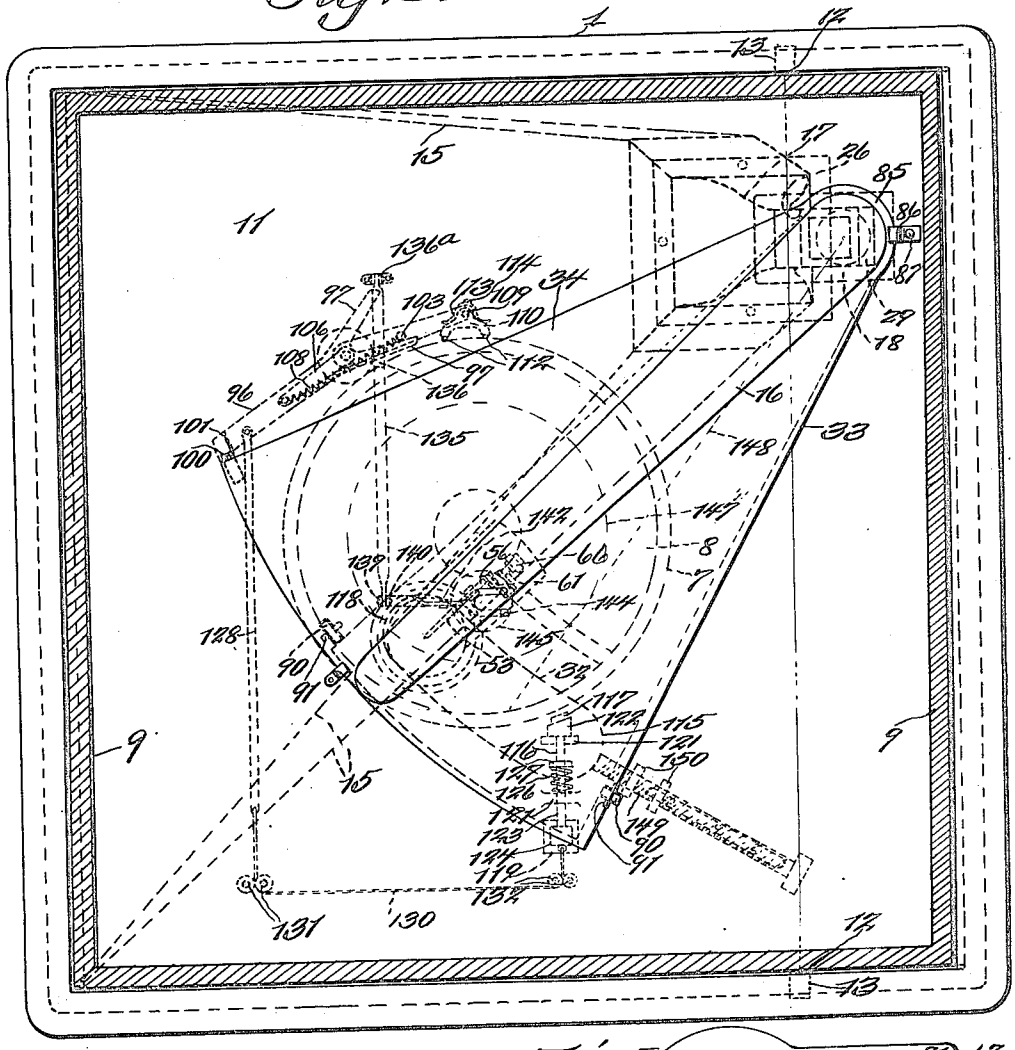


Fig. 4.

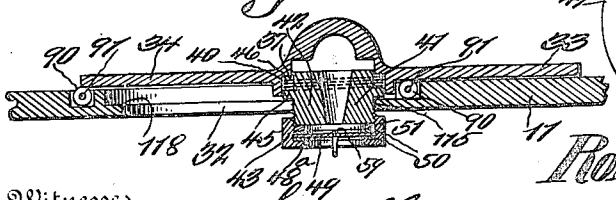
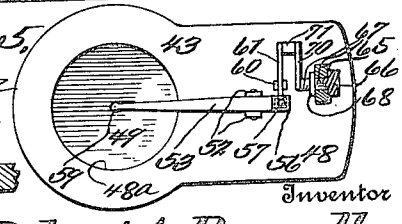


Fig. 5.



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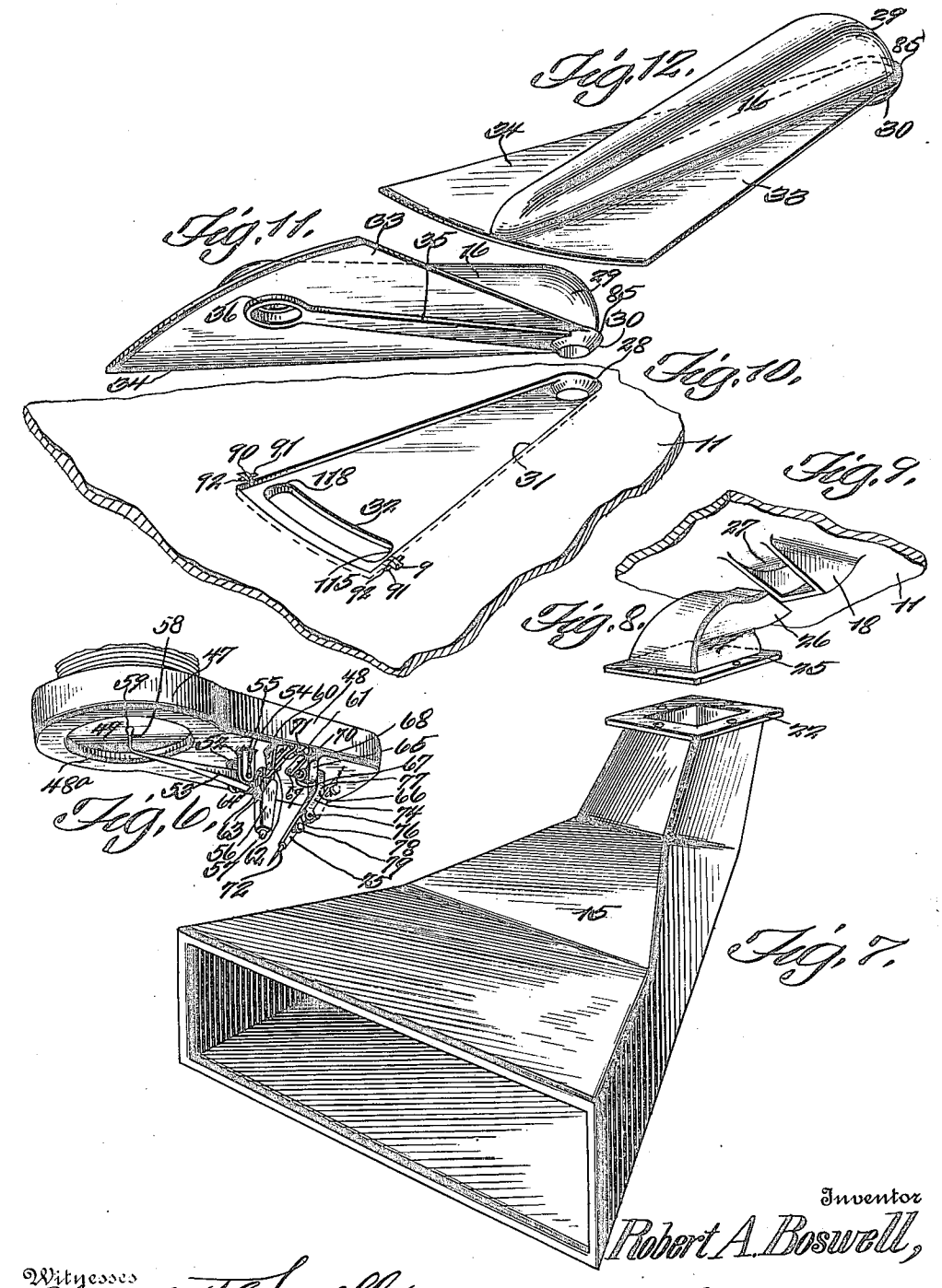
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

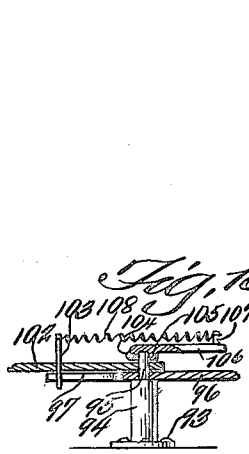


Fig. 15.

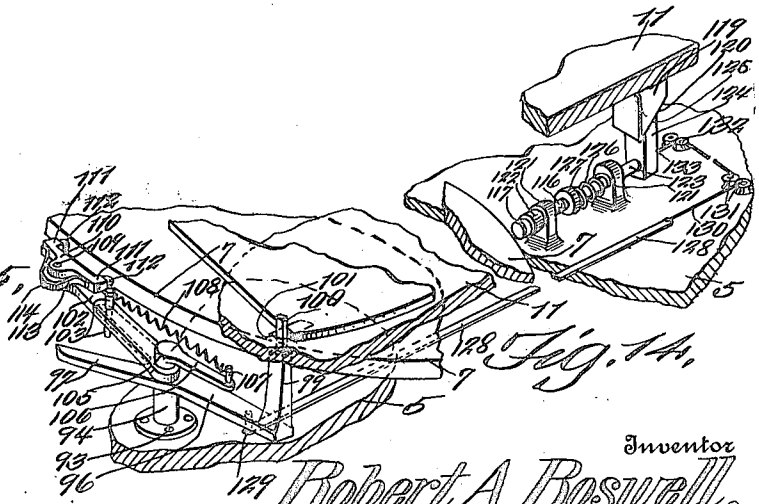


Fig. 14.

Witnesses

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Patented Sept. 19, 1922. 1,429,839

UNITED STATES PATENT OFFICE.

ROBERT A. BOSWELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

CABINET TALKING MACHINE.

Application filed September 4, 1917. Serial No. 189,565.

To all whom it may concern:

Be it known that ROBERT A. BOSWELL, a citizen of the United States of America, residing at Washington city, District of Columbia, has invented a new and useful Cabinet Talking Machine, of which the following is a specification.

In the art of accoustics, there are talking machines known as the cabinet machines, and in such machines the horn or the amplifier, which has also become called the bell end, is encased in the cabinet. However, in this style of machine the tone-arm (which is also called the reproducer arm) remains in full view, and is, without a doubt, the source of many inconveniences and disadvantages.

For example, the tone-arm, after having raised the cover, is required to be lifted and placed to one side of the disc or record, when having finished playing said record, the table having been stopped. It has been found the tone-arm, in being lifted, has been allowed to drop accidentally, marring or scarring the record, damaging the needle or stylus, and also very apt to injure the diaphragm of the sound box or reproducer. Furthermore, in moving or placing the tone-arm to one side, the record or disc is more or less very apt to become scratched, blunting the needle or stylus, owing to the same dragging across the record loosening or otherwise affecting the bearings or trunnions of the stylus holder, and also acting to injure the diaphragm of the sound box by tending to dish it.

After placing the arm to one side, the record must be removed, a new record placed on the table, the tone-arm replaced in starting position, the turn table released and allowed to start, and the cover lowered.

Consequently, this invention relates to an improved cabinet talking machine, in which both the arm and the horn or amplifier are entirely housed, the former in the cover of the cabinet and the latter in the cabinet.

Therefore, it is clearly obvious that this invention's basic objects involve overcoming or eliminating of the aforesaid many inconveniences and disadvantages.

Close observation has disclosed the fact that persons do not, as a rule, allow the cover of a talking machine cabinet to drop, they generally grasp the cover firmly, which, it has been discovered is not the case in grasping the old style tone-arm (which is in full view), since the tone-arm and its sound box are delicately constructed and require very careful handling. It is an established fact, the careful handling of any object or implement, results in its dropping more readily than if handled roughly or firmly.

It is obvious since the tone-arm is encased, the cover may be handled firmly as well as very quickly, and without any apprehension of injury to any part of the machine.

The tone-arm is lifted by the cover, consequently it is relieved of direct handling.

A further object of the invention is to provide an enclosed tone-arm, which is restored to starting position by gravitation and controlled by the cover.

As a further object of the invention it is found, since the tone arm is lifted by the cover, consequently restored to starting position by gravitation, said tone-arm is relieved of the possibility of its being dropped, or dragged across the record or disc.

A further object of the invention is the provision of a cover carrying tone-arm, and means to be engaged and operated by a part of the tone-arm, whereby the turn-table may be stopped at the completion of the music of said record, said stopping means having connections with means to actuate the usual governor brake mechanism to also stop the turn table.

A further object of the invention is the production of tensioned means controlled by the cover, and released, when the cover is raised, to restore the stopping mechanism, which releases the turn-table, and which tensioned means is adapted to engage and hold the turn-table at rest, while the cover is in a raised position, and when the cover is lowered said tensioned means is actuated to release the turn table allowing it to rotate.

A further object of the invention is the provision of a cover removing and resetting tone-arm.

A further object of the invention is to provide a cabinet, a hollow hinged cover therefor, and an amplifier or horn carried in the cabinet and the tone-arm carried and encased in the cover, both being hinged or piv-

oted concentrically with the hinge of the cover, whereby the sound from the sound box (which operates through an opening in the bottom of the cover) will pass through the amplifier and emanate from the bell-end thereof.

A further object of the invention is the provision of means for returning the tone-arm to its starting position.

A further object of the invention is to provide an amplifier or horn and a tone arm constructed of any suitable material, preferably thoroughly seasoned wood, such as maple, pine-bellies or spruce-backs, such as is used in constructing violin bodies. Since the passage from the sound-box to the terminus of the bell-end is constructed entirely of wood, the sound as it passes through the tone-arm and the horn is amplified.

In commercial fields there are records called "Diamond" disc records, which have the sound waves on the bottom of the sound groove, whereas there are other disc records, which have the sound waves on the side walls of the sound grooves, hence requiring two different kinds of sound boxes, one whose diaphragm vibrates vertically and another whose diaphragm vibrates laterally.

Consequently, the further object of the invention is the provision of a sound box having a pair of needles, one to respond to the bottom sound wave, the other to respond to side walls sound waves, whereby a single vertically vibrating diaphragm sound box may be employed, so that various makes of records may be reproduced without changing the sound box.

The invention is disclosed in such structures, which, at present are deemed the most preferably, practicable and efficient, but which are not to be restricted. In practice various changes and alterations, may be necessary, consequently the right to such changes and alterations that may be required, is claimed, provided they fall within the limits of the appended claims.

The invention comprises further features and combination of parts to be hereinafter set forth, shown in the drawings and claimed.

In the drawings:—

Figure 1 is a view of a talking machine of the cabinet type, showing the cover constructed hollow, with the tone-arm pivotally mounted therein, and the other features of the invention applied.

Figure 2 is a sectional view on line 2—2 of Figure 1.

Figure 3 is a sectional view on line 3—3 of Figure 2.

Figure 4 is a sectional view on line 4—4 of Figure 2.

Figure 5 is a bottom plan view of the improved double stylus sound box, showing parts of the stylus holder in section.

Figure 6 is a perspective view of the double stylus sound box or reproducer.

Figure 7 is an enlarged detail perspective view of the bell-end of the amplifier.

Figure 8 is a detail perspective view of a coupling member between the amplifier or horn and the bottom of the cover of the cabinet.

Figure 9 is a detail perspective view of a portion of the bottom of the cover, showing the bottom constructed with an integral coupling part.

Figure 10 is a detail perspective view of a portion of the bottom of the cover, showing the upper face thereof, showing an impression therein in which a portion of the tone-arm plays, and over which a part of the tone-arm moves.

Figure 11 is a detail perspective view of the tone-arm, showing it in a position ready to be assembled in connection with the bottom of the cover.

Figure 12 is a detail perspective view of the tone-arm showing its upper part.

Figure 13 is an enlarged detail perspective view of the means to co-operate with the brake mechanism of the turn table for stopping the same.

Figure 14 is an enlarged detail perspective view of the means for stopping the turn-table and the means for releasing the first means when the cover is raised, and when raised the second means is designed to stop and hold the turn table.

Figure 15 is a sectional view through the turn table stopping means shown in Figure 14.

Referring more especially to the drawings, 1 designates a talking machine as a whole, and which may have its cabinet constructed in any conventional manner, and in whose cabinet a conventional form of motor 2 is encased. However, this motor is suspended from a plate 3, which is secured at 4 to a partition 5 of the cabinet. A separate casing 6 also encloses the motor. Mounted upon the motor shaft 6 is the usual form of turn-table 7, designed to support any conventional record or disc 8, either the bottom or the side walls of the sound grooves thereof, may contain the sound waves. The partition 5 is spaced below the upper edge of the walls of the cabinet, and 9 denotes the cover. This cover is constructed hollow and is provided with any suitable top as shown at 10, and a bottom 11. Near the rear part of the cover on its opposite sides suitable pintles 12 are provided, which are mounted in bearings 13 of the sides of the cabinet near its upper marginal edge thereof, thereby pivotally mounting the cover, as shown clearly in Figures 1 and 2 of the drawings.

As is the aim of this invention the amplifier 14 as a whole is entirely encased, and

as is usual the rule it consists of what is known as the bell-end 15, the tone-arm 16 and the uniting couplings 17 and 18. The bell-end of the amplifier is encased in the cabinet below the partition 5 and above the record compartment 19, and its terminus is provided with the usual pivoted closures 20, which may be operated in any conventional manner. The bell-end of the amplifier is preferably constructed as shown in Figures 1, 2 and 7, and the smaller end thereof has a marginal flange 22, which is secured in a depression 23 of the lower face of the partition by means of the rivets or bolts 24. The coupling member 17 which may be any suitable shape preferably as shown in Figures 1, 2 and 8 has its lower part constructed with a marginal flange 25 which is secured in a depression 26ª by the rivets or bolts 24. The coupling member 18 forms an integral part of the bottom of the cover 9, and is preferably rectangular in cross section, corresponding to the rectangular shape of the curved extension 26 of the coupling member 17. As shown in Figures 1, 2, 8 and 9 the coupling members 17 and 18 are curved concentric with the pivots 12 of the cover, whereby the extension 26 may telescope the coupling member 18. The coupling member 17 and 18 are hollow and the portion 27 of the interior of the coupling member 18 is curved concentric with the pivots 12, whereby as the cover is raised, the member 18 will readily telescope the extension 26 of the coupling member 17. The upper face of the bottom of the cover adjacent where the coupling member 18 merges from the bottom is provided with a spherical depression 28, and the elbow end 29 of the tone-arm terminates in a spherical enlargement 30, which seats and operates in the depression 28, whereby the tone-arm may oscillate laterally. Furthermore, the elbow end 29 of the tone-arm constructed concentrically with the pivots 12 of the cover, and in this manner it will be seen that the passage through the amplifier is unobstructed, hence the sound emanating from the sound box will have a clear and smooth passage, until it leaves the terminus of the bell-end. Radiating from the depression 28 of the bottom 11 of the cover is a segment shaped depression 31. The bottom of the cover adjacent the end of the depression 31 is provided with a segment slot 32 curved concentrically with the center of the depression 28. The tone-arm 16 is provided with laterally extending segment shaped extension plates 33 and 34, which move over the depression 31 when the tone-arm oscillates laterally in one direction or the other. Merging radially from the spherical enlargement 30 of the elbow end of the tone-arm is a rib 35, which operates in the depression 31, and the end of this rib terminates in an annular flange 36, which surrounds the marginal edge of the opening 37 of the terminus or smaller end 38 of the sound passage 39 of the tone-arm. Where this flange 36 is constructed an annular shoulder 40 is provided. A conventional form of sound box 41, preferably comprising the body part 42 and the diaphragm and stylus carrying part 43, is provided. The body part is provided with a tapering opening 44, which taper is a continuation of the taper of the passage 39. The body part 42 is cylindrical, and is mounted and movable in the segment slot 32, and has an annular flange 45, which engages on the upper face of the depression 31 near the marginal edges of the slot 32. A very light spring 46 is interposed between the shoulder and the flange 45, acting to hold the flange normally in contact with the upper surface of the depression 31. The stylus carrying part of the sound box comprises an annular portion 47 and a tail piece 48, and the lower part of the opening through the annular part 47 has a flange 38. The usual diphragm 49 constructed preferably of mica is supported in the opening of the annular part 47 by the fiber rings 50 and the holding ring 51, which is threaded on the interior of the opening of said annular part 47. It is to be noted that the fiber rings and the diaphragm are arranged in the order shown, between the flange 48 and the holding ring 51, while the body part 42 of the sound box is threaded into the opening of said annular part 47 of the sound box, further holding the diaphragm firmly in place. The lower face of the tail piece 48 is provided with spaced lugs 52, between which a stylus holder 53 is arranged. The stylus holder 53 is provided with laterally extending pintles 54, which are mounted in bearings 55 of said lugs. The stylus holder is angular in construction, and its shorter arm 56 (which is nearer the pivots 54) carries a stylus 57, while its longer arm gradually tapers and terminates in a very thin lateral extension 58, which is secured in the usual manner as at 59 to the diaphragm. It is to be observed that the shorter arm extends downwardly toward the record 8 which may be carried on the turn-table, whereby the stylus 57 may accommodate itself to the bottom sound waves of the grooves of the record. In fact this form of stylus is particularly used on those records classified as the "Diamond" disc records. The under face of the tail piece 48 carries additional spaced lugs 60, which are positioned at right angles to the lugs 52, and pivoted between said lugs 60 is an oscillating lever or link 61, said pivots 62 consisting of pintles carried by the link 61. However, the pivots 62 and 54 may be screws, or of such construction as to avoid any loose movements of the pivoted parts. The upper edge of the stylus holder

near the short arm 56 is provided with spaced lugs 63, between which on the pivots 64 the short end of the link or lever 61 is pivoted. A lug 65 is formed integral with the underface of the tail piece 48 and is spaced from the lugs 60. A second stylus holder 66 is provided with a laterally extending threaded projection 67, which is mounted rockably in a bearing of the lug 65. A collar 68 is threaded on the projection 67, and is adapted to be set up, so as to draw the stylus holder 66 in contact with the lug 65, sufficiently to prevent any loss movement. Furthermore, the projection 67 is designed to be mounted in its bearing in order to prevent any looseness of play. Said projection 67 is provided with a reduced extension 69 rectangular in cross section, and secured firmly on this extension is an arm 70. The projection 67 is mounted to rock axially with the pivots 62 of the link 61. The long end of the link 61 and the free end of the arm 70 are connected by the cross connection 71. This cross connection should be rigid, so that the arm 70 and the link 61 would move as though they were as one body. The pivots 65 and all of the connections between the two stylus holders should be positive and such as to avoid any looseness of play, so that the stylus 72 when accommodating itself to the side wall sound waves, the movements would be transferred from the stylus holder 66 to the holder 63, and consequently to the diaphragm 49, thereby reproducing the various notes of the record. The stylus holder 66 consists of two parts 74 and 75, which are connected together pivotally by means of a rule joint 76, and from the point 77, said stylus holder 66 is disposed on an inclination, as shown in the drawings particularly Figure 6. By means of the shoulders 78 of the rule joint the two parts of the stylus holder are held in alignment, and the part 75 receives the stylus 72, which is held in place by means of the set screw 79. When it is desired to utilize the stylus 72, the part 75 of the holder is moved from its dotted line position to its full line position, so that the point of the stylus may follow the sound groove of the record. When the part 75 of the holder is in its dotted line position the stylus 57 may be used to travel in the sound groove of the record, in order to respond to the bottom sound waves of the groove. It is to be observed that by this improved sound box, different types of records may be played, by merely shifting the stylus holder, the holder 56 for a "Diamond" disc record, and the holder 66 may be employed to accommodate itself to the lateral sound waves, say for instance the sound groove of a "Victor" or a "Columbia" record.

The elbow end of the tone-arm 16, where it is formed with the spherical enlargement 30 has an annular shoulder 85, which is engaged by a plate or clamp 86, which is secured in place on the partition 11 by means of the screw 87, thereby retaining the enlargement 30 in its spherical bearing adjacent the coupling member 18. Holding plates 88 are secured at 89 to the partition 11 and are angular in cross section, designed to overhang the extension plates 33 and 34, thereby preventing upward movement of the tone-arm, as it plays over the depression 31. By means of the spring 46 either one of the needles of the sound box is held in constant contact with the sound groove, the sound box being held yieldably in place. Adjacent the extreme outer end of the side walls of the depression 31 anti-frictional rollers 90 have their pintles 91 mounted in bearings 92 of the bottom 11 of the cover. The extension plates 33 and 34 of the tone-arm engage on these anti-friction rollers 90, thereby allowing the tone-arm to freely move as the stylus or needle follows the sound groove of the record, the anti-friction rollers 90 acting to prevent retardation of the tone-arm.

Secured at 93 on the partition 5 of the cabinet is a standard or post 94 provided with a reduced extension 95, on which a lever 96 is rockably mounted, that is to rock horizontally. This lever 96 is provided with forks 97, and its arm 98 is provided with an upstanding extension 99, a reduced part 100 of which extends through an opening 101 of the bottom 11 of the cover, and in the path of the extension plate 34. Also mounted upon the post or standard is a lever 102, which also rocks. A pin 103 is mounted vertically in said lever, and the lower end of the pin is designed to play between the forks 97 of the lever 96. Secured by a set screw 104 to the extension 95 is the hub end 105 of the arm 106, the end portion of which has an upstanding lug 107. A spring 108 has one end connected to the lug 107, and its other end to the upper end of the pin 103, and is designed to contract on either side of the post or standard 95, in order to hold the lever 102 from or toward the turn-table. Pivoted at 109 on an enlarged end of the lever 102 is a member 110 provided with lateral arms or projections 111. These arms or projections 111 are provided with brake shoes 112, designed to bear frictionally against the peripheral edge of the turn-table. A spring 113 is secured at 114 to the enlarged end of the lever 102 and has its end portions bearing against the end parts of the member 110, in order to hold the brake shoes against the peripheral edge of the turn-table with equal pressure. The spring 113 is also designed to retain the member 110 in its proper position, whereby the brake shoes may engage the edge of the turn-table.

When a record is placed upon the turn-table, and the cover of the cabinet is closed, the tone-arm having moved, whereby the body part of the sound box is positioned in the end 115 of the slot or opening in the bottom 11, the lever 102 is held from adjacent the edge of the turn-table by means of the spring 108, it having contracted on the outside of the post or standard 94. When the cover of the cabinet is closed, the sliding member 116 is actuated, whereby its brake shoe 117 is withdrawn from contact with the edge of the turn-table, allowing it to rotate. One or the other of the needles of the sound box will then follow the sound groove of the record, until the sound box reaches the other end 118 of the slot or opening in the bottom 11 of the cover, in which case the edge of the extension plate 34 will contact with the reduced extension 100 of the upstanding arm 99, thereby oscillating the lever 96, causing one of its forks to bear against the lower portion of the pin 103. The lever 96 is rocked sufficiently, and until the spring 108 contracts on the other side of the standard or post 94 as shown in Figure 3, throwing the lever 102, whereby the brakes shoes 112 of the member 110 will frictionally contact with the marginal edge of the turn-table, and consequently stop the same. The bottom of the cover is provided with an integral lug 119 which is supplied with an angular or inclined surface 120. The member 116 is slidably mounted in the spaced lug 121, and its enlarged end 122 carries the brake shoe 117. The other end 123 of the member 116 has a right angled extending arm 124, the upper end of which is beveled or inclined as shown at 125, adapted to be engaged by the bevelled or inclined surface 120 or the lug 119, that is when the cover is closed. When these two inclined surfaces contact as the cover reaches its closed position the member 116 is moved axially in its bearings and tangentially from the edge of the turn-table, against the action of the spring 126, which is interposed between the collar 127 (which is threaded upon the member 116) and one of the lugs 121. A suitable steel tape or the like 128 is secured at 129 to the lever 96 at one end and has a wire 130 connected to its other end. This wire 130 passes between the rollers or pulleys 131 and 132, arranged in pairs, as shown clearly in Figures 3 and 14. The wire 130 is in turn connected at 133 to the upstanding arm 124 of the member 116. Consequently it will be seen that when the cover of the cabinet is raised or elevated on its hinge, thereby separating the inclined surfaces of the parts 119 and 124, the spring 126 will actuate its member 116, whereby its brake shoe 117 will engage the marginal edge of the turn table. Since the member 116 is capable of axial movement by the action of the spring 126, the tape 128 is given a pull which will oscillate the lever 96. For instance the end of the lever 96 having the upstanding arm 99 will move toward the turn-table, and the fork of the lever 96 nearest the turn table will bear against the pin 103, and oscillate the lever 102 away from the turn-table, sufficiently until the spring 108 again contracts on the outer portion or outside of the post or standard 94, thereby disengaging the brake shoes 112 from the edge of the turn-table. When the brake shoes 112 are disengaged from the edge of the turn-table, the brake shoe 117 is brought into contact with the opposite edge of the turn-table, in order to hold it at rest temporarily while the cover is raised. However, when the cover is raised, the marginal edge of the extension plate 34 is disengaged from the extension 100, and the tone-arm 16 is automatically restored to its starting position, for instance until the body of the sound box reaches the end 115 of the slot or opening in the bottom 11 of the cover. A lever 135 is pivoted at 136 to the upper face of the partition 5 of the cabinet, and carried upon said lever is a cam member 137. The end portion 138 of said lever 135 is pivoted at 139 to the upstanding link 140, which is pivoted at 141 to the usual governor brake lever 142 of the motor 2. This brake lever 142 is pivoted at 143 to the frame of the motor, and its brake shoes 144 are designed to engage the usual frictional disc 145 of the governor mechanism of said motor, when the tension of the spring 146 is overcome. The overcoming of the tension of the spring 146 is accomplished, when one of the forks of the lever 96 rides upon the cam 136, which depresses the lever 135, and rocks the governor brake lever 142, bringing the brake shoes 144 frictionally in contact with the disc 145, thereby stopping the motor. By stopping the motor in this manner, the turntable is likewise stopped, and consequently it will be seen that both of these mechanisms are operated simultaneously. The dotted line 147 indicates where the marginal edge of a nine inch record would become positioned, and the dotted line 148 indicates where the axis of the tone-arm would become positioned, when playing a nine inch record, and in order to stop or limit the tone-arm in its resetting position, a screw 149 is threaded in the spaced lugs 150 of the under face of the bottom of the cover, whereby the extremity of said screw may contact with the peripheral edge of the sound box, whereby the tone arm may be limited in its position to play either a nine or twelve inch record. The screw 149 is provided with calibrations, so that it can be adjusted for a nine or a twelve inch record, or for a six

inch record. By mounting the tone-arm in its spherical bearing to one side of the center of the cover of the cabinet, it will return to its initial position by gravitation, when the cover is in the act of being raised.

The present invention involves improvements over the patents issued July 2, 1907; March 15, 1910; July 11, 1911; and August 8, 1911, Patent Nos. respectively, 859,165; 951,998; 997,265; and 999,954.

The invention having been set forth what is claimed as new and useful is:

1. In a talking machine, a cabinet, a hinged cover therefor, a tone-arm carried in said cover and pivoted concentrically with the hinge of the cover.

2. In a talking machine, a cabinet, a hollow cover hinged thereon, and a tone-arm carried within the hollow of the cover and pivoted concentrically with the hinge of the cover, the bottom of the cover having a segment opening, and a sound box carried by the tone-arm playing through said opening.

3. In a talking machine, a hinged cover, a tubular tone-arm carried by the cover and pivoted with the hinge of the cover, whereby the arm is restored to starting position by gravitation.

4. In a talking machine, a cabinet, a hinged hollow cover therefor, an amplifier comprising a bell-end mounted in the cabinet, and a tone-arm mounted in said cover and pivotally carried concentrically with the hinge of the cover, and means whereby the restoration of said arm to starting position is effected by gravitation.

5. In a talking machine, a cabinet, a hinged hollow cover therefor provided with a bottom, an amplifier comprising a bell-end mounted in the cabinet, and a tone-arm mounted in said cover and pivotally carried concentrically with the hinge of the cover, and means whereby the restoration of said arm to starting position is effected by gravitation, the arm being operable through the bottom of the cover.

6. In a talking machine, a cabinet, a cover therefor, a tone arm, means for supporting the tone-arm within the cover, a reproducing mechanism operatively and yieldably mounted between the end of the tone arm and the supporting means.

7. In a talking machine, a cabinet, a hinged hollow cover therefor, an amplifier comprising a bell-end mounted in the cabinet, and a tone-arm mounted in said cover and pivotally carried concentrically with the hinge of the cover and to one side of the center thereof, whereby said arm is restored to starting position by gravitation.

8. In a talking machine, a cabinet having a countersunk top, a hollow cover hingedly mounted upon the sides of the cabinet and adapted to swing partially into the cabinet and spaced from said top, an amplifier consisting of a bell-end terminus mounted in the cabinet, a tone-arm mounted in the cover pivotally to one side of the center of the cover and concentric with the hinge thereof, and telescoping couplings concentric with the hinge connection of the cover between the bell-end terminus and the tone-arm.

9. In a talking machine, a cabinet, a hollow cover hinged thereon, a tone-arm pivoted in the cover concentric with the hinge thereof, an amplifier in the cabinet, the bottom of the cover having a coupling member concentric with the rear end of the tone-arm, a second coupling member connected to and being a continuation of the amplifier and telescoping the first coupling member concentric with the said hinge.

10. In a talking machine, a cabinet, a hinged cover thereon, a tone arm having a rear elbow end having a spherical member and socket connections in the bottom of the cover, said elbow being concentric with the hinge of the cover, the bottom of the cover having a coupling member, and an amplifier in the cabinet provided with a telescoping coupling connection with said coupling member.

11. In a talking machine, a cabinet having a terminus amplifier therein, a hollow cover hinged on the cabinet, the bottom of the cover having a segment slot, a tone-arm pivoted in the hollow cover, its pivot being concentric with said slot and concentric to and to one side of the hinge of the cover, the bottom of the cover having coupling connections with said amplifier, a sound box movable in the slot and having yieldable telescoping connections with the free end of the tone-arm, said tone-arm having means to cover either end of the slot during the movement of the arm.

12. A talking machine cabinet, a horn therein, a cover pivoted to the cabinet, a tone-arm housed in the cover and coupled to the horn concentrically with the pivot of the cover.

13. A talking machine cabinet, an amplifier housed therein, a cover hinged to the cabinet, a tone-arm housed in the cover and coupled to the amplifier concentrically with the hinge of the cover and being mounted to one side of the center of the cover.

14. A talking machine cabinet, an amplifier housed therein, a cover hinged to the cabinet, a tone-arm housed in the cover and pivoted to one side of the center of the cover, said tone-arm having coupled connections with the amplifier concentrically with the hinge of the cover.

15. A talking machine cabinet, an amplifier housed therein, a cover hinged to the cabinet, a tone-arm housed in the cover and pivoted to one side of the center of the cover, said tone-arm having coupled connections with the amplifier concentrically with the

hinge of the cover, the bottom of the cover having an opening therein, said tone-arm having means protruding through the opening provided with a sound-box and a stylus to play on a record when the cover is closed.

16. A talking machine cabinet, a horn therein, a cover pivoted to the cabinet, a tone-arm housed in the cover and coupled to the horn concentrically with the pivot of the cover, the bottom of the cover having an opening concentric with the mounting of the tone-arm, said tone-arm extending through the opening and having a sound-box and stylus means to play on the record. Since the passage from the sound-box to the terminus of the bell-end is constructed entirely of wood, the sound as it passes through the tone-arm and the horn is amplified.

17. A talking machine cabinet, a horn therein, a cover removed and returned tubular sound-conducting tone-arm, and means for coupling the arm to the horn, whereby a passage of communication through one to the other is effected.

18. A talking machine cabinet, a horn therein, a hollow cover, a tubular sound-conducting tone-arm entirely housed in and carried by the cover, and means for coupling the cover to the cabinet, whereby a passage of communication is effected through the tone-arm and the horn.

19. A talking machine cabinet, a horn therein, a hollow cover, a tubular sound-conducting tone-arm entirely housed in and carried by the cover, means for coupling the cover to the cabinet, whereby a passage of communication is effected through the tone-arm and the horn, and means carried by the cover cooperatively functioning with the tone-arm to cause the return of said arm to starting position.

20. A talking machine cabinet, a horn housed therein, a hollow cover, a tubular sound-conducting tone-arm entirely housed in the cover and carried thereby, and means for coupling the arm to the horn.

21. A talking machine cabinet, a horn housed therein, a hollow cover, a tubular sound-conducting tone-arm entirely housed in the cover and carried thereby, means for coupling the arm to the horn, and means for coupling the cover to the cabinet concentrically with the arm, whereby the arm and the cover move together.

22. In a talking machine, a cabinet, a horn housed therein, a tubular sound-conducting tone-arm, a hollow cover hinged to the cabinet and entirely housing said arm, the bottom of the cover carrying means for coupling the arm to the horn.

23. In a talking machine, a cabinet, a horn housed therein, a tubular sound-conducting tone-arm, a hollow cover hinged to the cabinet and entirely housing said arm, the bottom of the cover carrying means for coupling the arm to the horn, and means carried by the cover and adapted to be functioned cooperatively with the tone-arm to cause the return of said arm to starting position.

24. A cabinet-housed amplifier, a cover-removed and returned tone-arm, and a communicative connection coupling them.

25. A cabinet-housed amplifier, of a movable member, sound-reproducing and conveying means housed and controlled by said member and having a communicative connection with said amplifier.

26. A cabinet-housed amplifier, a sound-reproducing and conveying means, a housing member therefore having a support for said means, and a communicative connection between said amplifier and the means through the support.

27. A cabinet-housed amplifier, a hollow cover, a tone-arm housed therein, said cover having a support adapted to be actuated by the cover, whereby a force is available to return the arm to starting position, said arm being a communicative connection with said amplifier.

28. In a talking machine, a cabinet, a moving record support, a cover for the cabinet, a tone arm in the cover, a support for the tone arm carried by the cover, a reproducing device loosely supported by and movable relatively to the support and having a loosely yieldable connection with the tone arm, whereby the reproducing mechanism may accommodate itself to the irregularities of the record on the record support.

29. A cabinet-housed amplifier, a tone-arm communicating therewith, a hollow cover housing said arm and provided with a bottom to lift the arm from the record and to form an inclined guide when the cover is raised to return the arm to starting position.

30. A cabinet-housed amplifier, a gravity-restored tone-arm in communicative connection therewith, and a cover controlling said arm.

31. The combination with a cabinet, of a record reproducing mechanism thereon, including a tone arm means controlling the starting and stopping of the record, and means controlling the first means, and adapted to be actuated to render a force available, thereby effecting the return of the tone-arm.

32. In a cabinet talking machine, a cabinet, a record table to rotate thereon, a movable element, a reproducing mechanism including a tone-arm carried in said element, means carried and actuated by said element to render a force available for returning said arm to starting position, means being operated by said arm for detaining

the table, and means allowed to operate, when the element is moved, for holding said table and restoring the second means to its normal condition.

33. The combination with a cabinet, of a record table to rotate thereon, a reproducing mechanism for the record, means actuated by the tone-arm of the mechanism to detain the table, a movable element adapted to be actuated, whereby a force is available to return said arm to its starting position, and means adapted to be released by said element to engage the table and release the first means from engagement with the table, whereby the first means is restored to its normal condition.

34. The combination with a cabinet, of a record table to rotate thereon, a reproducing mechanism for the record, means actuated by the tone-arm of the mechanism to detain the table, a movable element having a part forming an inclined guide when the element is raised, whereby under the influence of gravitation the tone-arm is returned to its starting position, and means adapted to be released by said element to engage the table and release the first means from engagement with the table, whereby the first means is restored to its normal condition.

35. The combination with a cabinet, of a record table to rotate thereon, a reproducing mechanism for the record, a pair of movable elements, one being controlled by the other for returning it to a starting position through an available force and carrying said mechanisim, a pair of mechanisms, one controlling the other, and both being cooperatively controlled by said elements respectively for detaining the table and releasing said table when one of said elements is raised and lowered.

36. A cabinet-housed amplifier, a gravity-restored tone-arm in communicative connection therewith, a cover controlling said arm, means engaged by the arm to detain the record table, and means allowed to operate by the raising of the cover and being connected with the first means to release it and restore it to normal condition.

37. In combination with a housed amplifier, a tone-arm in communicative connection therewith, a hollow cover in which said arm is pivoted, and means carried by the cover cooperatively functioning with the arm, whereby a force is available to return said arm to starting position.

38. In combination with a cabinet-housed amplifier, of a tone-arm in communicative connection therewith, a hinged hollow cover in which said arm is carried pivotally with the hinge of the cover, and means carried by the cover cooperatively functioning with the arm, whereby an operating medium is available, to return said arm to starting position.

39. In combination with a cabinet-housed amplifier, of a tone-arm in communicative connection therewith, a hinged hollow cover provided with a bottom, and in which cover said arm is carried pivotally with the hinge of the cover, whereby the bottom will lift the arm when the cover is raised.

40. In a talking machine, a cabinet, a movable record support operatively mounted on the cabinet, a cover, a tone arm therein, means for operatively supporting the tone arm in the cover, a reproducing mechanism movably connecting with said means and being in turn loosely and yieldably connected to the tone arm, whereby the reproducing mechanism may be played across the record when the cover is closed.

41. A cabinet, a record table thereon, an amplifier in the cabinet, a cover, a tone-arm therein and in movable communicative connection with the amplifier, and a sound-reproducing mechanism carried by the end of the arm and being yieldable with respect to the cover and the arm.

42. A cabinet, an amplifier therein, a movable cover, means movably coupling the cover and the amplifier, and a cover-removed and returned tone-arm in the cover and in communicative connection with said coupling means.

43. A cabinet, an amplifier therein, a cover, a telescopical couple connecting between them, a cover-removed and returned tone-arm in the cover, and in communicative connection with said couple.

44. A cabinet-housed amplifier, a cover, a telescopical couple connecting between them, a cover-removed and returned tone-arm in the cover, said arm being pivoted communicatively with said couple.

45. A cabinet, an amplifier therein, a movable cover hingedly connected to the cabinet, a couple connecting the cover and amplifier, a cover-removed and returned tone-arm in the cover and in communicative connection with said couple, a sound-reproducing device, and yieldable means interposed between said device and the end of said arm, thereby mounting said device yieldably movable with respect to the bottom of the cover.

46. A cabinet-housed amplifier, a tone-arm in pivotal communicative connection therewith, a cover provided with means for lifting said arm and allowing it to be returned by gravity to initial position.

47. In a sound reproducing machine, the combination with a rotatable support for a sound record, of a sound arm movable on axes permitting it to swing toward and from and also across the record support, sound-reproducing mechanism carried by the sound arm, a cover movable toward and from the record support, and a guide carried by the cover and adapted, as the cover is raised and lowered, to lift the sound arm, allow it to

slide along the guide, and position it to effect the engagement of the sound-reproducing mechanism with the record at a predetermined point.

48. In a sound reproducing machine, the combination with a rotatable support for a sound record, of a sound arm movable on axes permitting it to swing across and also toward and from the record, sound-reproducing mechanism carried by the sound arm adapted to engage a record on said support, a member reciprocable successively away from and toward the sound record support, and a guide carried by and in fixed relation with said reciprocable member and adapted, as said member is moved successively away from and toward the record support, to lift the sound arm, allow it to slide along the guide, and position it to effect the engagement of the sound-reproducing mechanism with the record at a predetermined point.

49. A cabinet, a cover pivotally mounted thereon, an amplifier housed in the cabinet, a tone-arm pivotally mounted on the cover, a communicative connection between the arm and the amplifier, and means on the cover to cause the arm to be actuated by gravitation to a position, whereby, when the cover is lowered, the arm is returned to an initial position.

50. In a sound reproducing machine, the combination with a cabinet having a rotatable record support thereon, of an oscillatory cover movable vertically toward and from the record, a tone-arm in the cover and movable correspondingly therewith and also laterally with respect to the cover, sound reproducing mechanism on the arm, and a guide carried on the cover and on which said arm is pivoted and adapted, as the cover is raised and lowered, to lift said arm, allow it to slide along the guide, to effect the engagement of the sound reproducing mechanism with the record at a predetermined point.

51. In a sound reproducing mechanism, the combination with a cabinet having a rotatable record support thereon, of an oscillating cover movable vertically toward and from the record, a tone-arm pivoted on the cover movable correspondingly therewith and also laterally with respect thereto, sound reproducing mechanism on the arm, an amplifier housed in the cabinet, an element intermediate the arm and the amplifier and having means communicatively and pivotally connecting said arm and the amplifier respectively, said element having a guide adapted, as the cover is raised and lowered, to lift said arm, allow it to slide along the guide, and position it to effect the engagement of the sound reproducing mechanism with the record at a pre-determined point.

52. In a sound reproducing machine, a cover therefor, a moving record support, stop mechanism therefor, and a cover controlled and returned sound arm actuating said mechanism.

53. In a sound reproducing machine, a moving record support, a sound arm movable thereacross, means causing to be produced an available force by which said sound arm is returned to initial position, and means operatively connecting with the first said means for arresting the movement of said support during the interval of return of the sound arm.

54. In a talking machine, a cabinet, a movable record support thereon, a cover on the cabinet provided with a bottom having an arcuate opening, a tone arm operatively mounted within the cover on the bottom, a reproducing device engaging through the arcuate opening and guided therein and being loosely connected to the tone arm and adapted to cooperate with the record, and a yieldable connection between the reproducing device and the tone arm, thereby mounting the reproducing device yieldably with respect to the bottom of the cover.

55. A sound reproducing machine having a movable cover and embodying a record support, an amplifier, a sound arm operatively connecting with the amplifier, and means carried by the cover and engaging the sound arm to change the position of the latter relative to the record support.

56. A sound reproducing machine having a movable cover and embodying a record support, an amplifier, a sound arm operatively connecting with the amplifier, and means carried by the cover and engaging the sound arm, whereby a relative change in positions is effected by gravity between the sound arm and record support upon movement of the cover.

57. In a sound reproducing machine, a moving record support, means for stopping the same, a sound arm, and a cover operatively connecting with the sound arm and with said means, whereby the latter is actuated and the sound arm returned toward starting position upon movement of the cover.

58. In a sound reproducing machine, a cover therefor, a moving record support, means for stopping the same, a sound arm, and a member reciprocable to and from the record support and operatively connecting with the sound arm and with said means, whereby the latter is actuated and the sound arm returned toward starting position upon movement of the cover.

59. In a sound reproducing machine, a moving record support, a device for stopping the same, a sound arm, and common means for actuating said device and posi-

tioning the sound arm at a predetermined point with reference to the record support.

60. A sound reproducing machine embodying an amplifier, a sound arm operatively connecting therewith, a movable cover having means to engage and shift the sound arm to starting position, and means cooperating with the last said means to vary the starting position of said arm.

61. In a sound reproducing machine, the combination with a rotatable support for a sound record, of a sound arm movable on axes permitting it to swing toward and from and also across the record support, sound reproducing mechanism carried by the sound arm, a cover movable toward and from the record support, a guide carried by the cover extending under the sound arm, said guide and cover being mounted concentric with the arm, whereby as the cover is raised and lowered, the arm is lifted and allowed to slide along the guide, and thereby position it to effect the engagement of the sound reproducing mechanism with a record at a predetermined point.

62. The combination with a cabinet-housed amplifier, of sound-reproducing and conveying means, movable means housing the first means and having a communicative connection with said amplifier.

63. An attachment for talking machines having a cabinet and a cover, including a tone-arm and reproducing mechanism controlling means, and operating means therefor operable by the cabinet cover.

64. In a cabinet talking machine, a moving record support, a stop mechanism therefor, a tone-arm controlling said mechanism to arrest the support, a cover operatively connecting with the arm and controlling its replacement to initial position, said mechanism operatively connecting with the cover and controlled thereby, to hold the support at rest and to release it when the cover is lifted and lowered.

65. An attachment for talking machines comprising means adapted to be actuated to render a force available to shift the sound conductor of the machine laterally and cause vertical movements thereof to and from the operative position.

66. An attachment for talking machines having a cabinet and a cover, including a sound conductor controlling means, and operating means therefor operable by the cabinet cover.

67. An attachment for talking machines having a cabinet and a cover, including a sound conductor controlling means, stop means for the turntable of the machine, and means operable by the raising and lowering of the cover of the machine to actuate the first two mentioned means.

68. An attachment for talking machines having a cabinet and a cover, comprising a cover-removed and cover-returned sound conductor, and means actuated by the sound conductor and the cover of the machine for starting and stopping the machine.

69. An attachment for talking machines having a cabinet and a cover, comprising means adapted to be actuated to render a force available to shift the sound conductor of the machine laterally and cause vertical movements thereof to and from the operative position, and means actuated by the conductor and the cover of the machine for starting and stopping the same.

In witness whereof, in the presence of two witnesses, the inventor's signature is hereunto affixed.

ROBERT A. BOSWELL.

Witnesses:
A. L. HOUGH,
FRANCES H. HOYT.