

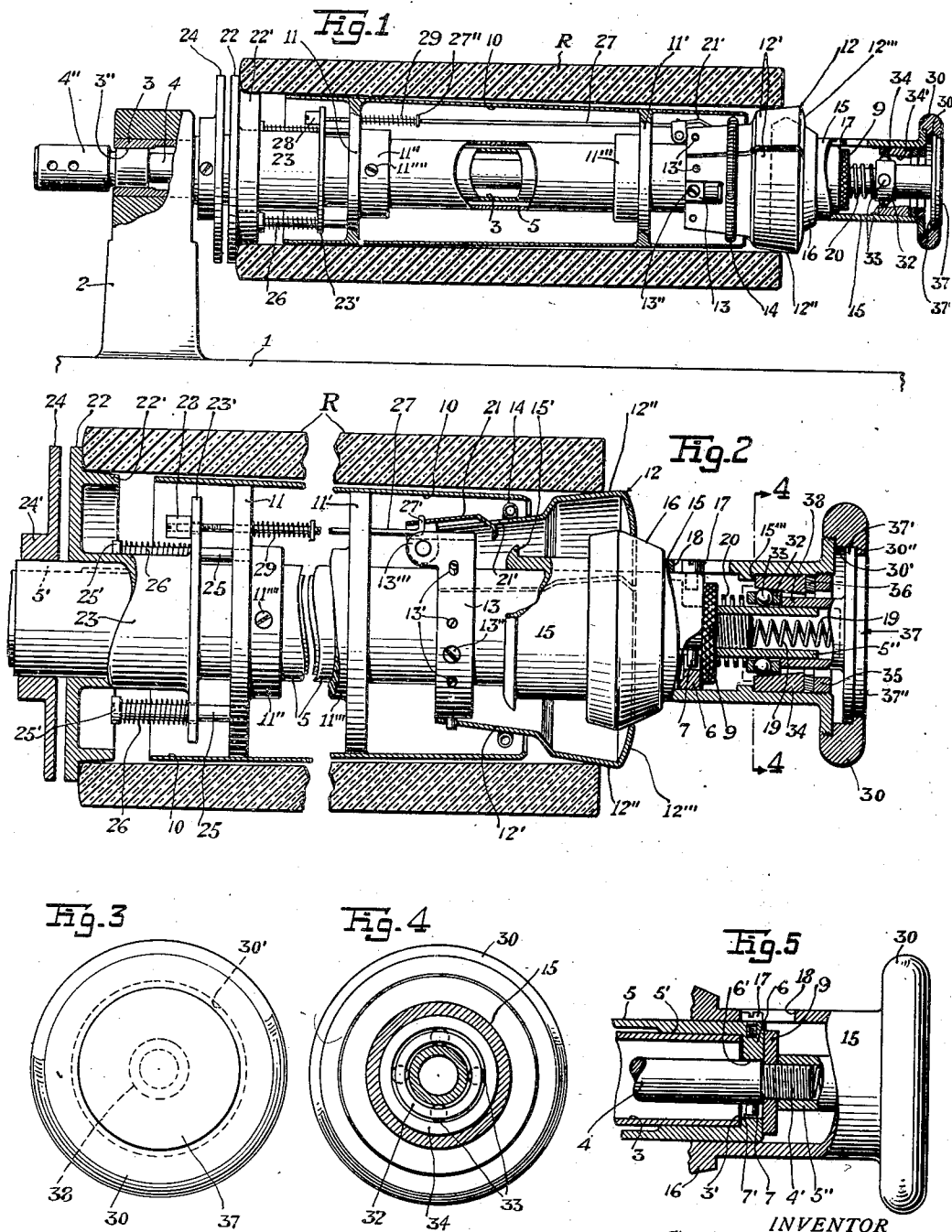
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PHONOGRAPH

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PHONOGRAPH

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This invention relates to phonographs, and more particularly to improvements in record supports therefor. While not in all aspects limited thereto, the invention contemplates particularly supports for cylindrical records, such as are commonly employed in the recordation and reproduction of dictation and the like.

From certain improved record supports a record is automatically ejected upon suitable actuation of an appropriate control member; and in some cases this ejection is effected substantially simultaneously with a releasing or freeing of the record by the support, which releasing action occurs upon actuation of the control member. An unintended ejection of the record from such a support, resulting as from accidental actuation of the control member, will cause not merely inconvenience to the operator but usually positive damage to the record, because of then existing engagement with the record or proximity thereto, of operating parts of the phonograph. Even in record supports which do not provide an automatic ejecting action, the unintended releasing of the record by the support will cause inconvenience and frequently will also result in record damage.

It is an important object of our invention to provide a construction whereby such unintended ejection of the record from its support is prevented.

It is a further object to provide a construction whereby unintended release of the record by the support is prevented, whether or not such release is accompanied by record ejection.

It is a still further object to provide in phonographic apparatus means which, although normally operative to prevent record release and/or ejection, may readily be rendered inoperative when the removal of a record from the support is desired.

Other and allied objects and additional features of our invention will more fully appear from the following description and the appended claims.

In connection with the following description of our invention, reference is had to the accompanying drawing, in which:—

Figure 1 is a front elevational view, partly in section, of a record support to which one embodiment of our invention is applied;

Figure 2 is an enlarged view, similar to Figure 1, but with parts broken away;

Figure 3 is an end elevational view of the knob at the right-hand extremity of the record support as shown in Figure 2;

Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 2; and

Figure 5 is a detailed view, partly in elevation and partly in section, of the knob and certain of the parts associated therewith.

In the description of our invention, reference is first directed to the general structural features of the record support as shown in Figures 1, 2 and 5. The numeral 1 designates a base on which is provided a standard 2. Rigidly secured in this standard and extending therefrom and rightwardly thereof is a sleeve 3, the right-hand end of this sleeve being indicated at 3' in Figure 5. A shaft 4 extends longitudinally within and axially of the sleeve 3, being journaled in a bearing 3'' formed at the left-hand end portion of the sleeve. A hollow shaft 5 surrounds the sleeve 3, extending rightwardly from adjacent the standard 2, and this hollow shaft is provided with terminal bearing portions journaled on the sleeve 3, the right-hand such bearing portion being shown at 5' in Figure 5. The right-hand end of shaft 5 is closed by a part or member 6 having a central hole 6' through which passes the shaft 4. The hole 6' is provided with a key-way 7' and the shaft 4 has a pin or key 7 which engages such key-way, the shafts 4 and 5 being thereby rendered rotatively secure with respect to each other. The shaft 4 has a threaded end portion 4' which extends to the right beyond the part or member 6. Shifting of shaft 4 to the right is prevented by its enlarged end portion 4'' disposed immediately to the left of standard 2, and shifting of this shaft to the left is prevented by a knurled nut 9 screwed onto the threaded end portion 4' and disposed immediately to the right of the end member 6. The nut 9 also prevents rightward movement of the hollow shaft 5, leftward movement of which is prevented by the right hand end of sleeve 3.

It will be understood that the shaft 4 is intended to be rotated by means suitably connected therewith to the left of standard 2, which means it is not necessary to illustrate herein. It will further be understood that the hollow shaft 5, by virtue of the structure above described, is rotated coincidentally with the shaft 4, essentially as though integral therewith.

In Figures 1 and 2 will be seen a hollow, generally cylindrical but rightward slightly tapered shell 10 concentrically surrounding the shaft 5 over most of the length of the latter. The shell 10 is supported on the shaft 5 by annular collars 11, 11' internally carried by the shell and respectively provided with hubs 11'' and 11''' fit-

ting about the shaft 5, the hub 11' being secured to that shaft by a screw 11'''. The shell 10 serves as means for guiding a cylindrical record R in its application to or ejection from the record support, but does not itself form the record supporting means, being slightly under the size of a shell capable of performing such supporting function. The record supporting means proper are provided adjacent the two ends of the shell, and will next be described.

The record supporting means adjacent the right-hand end of shell 10 comprises a hollow sectional conical chuck 12 which may be held either in a contracted condition to permit the passage thereof of a record during the application of the latter to or the ejection thereof from the record support, or in an expanded condition wherein it engages and supports the right-hand end of an applied record. The chuck 12 is supported on a collar 13 which embraces the shaft 5 within the shell 10 and is rigidly secured to that shaft as by a screw 13''. Secured to and extending outwardly from collar 13 is a series of annularly spaced pins 13'. The chuck 12 comprises three chuck members or jaws 12', near the left-hand extremities of which are provided enlarged apertures adapted to be respectively loosely engaged by the pins 13'. From the pins 13' the jaws 12' extend rightward for some distance, and are then abruptly shouldered to provide leftward convergent conical surfaces 12''. From the right-hand extremities of the surfaces 12'' the jaws are folded inwardly to provide flanges 12'''. A contracting urge is imparted to the chuck 12 by a coiled spring 14 encircling the jaws 12'.

The means for controlling the chuck 12 comprise a control cylinder 15 slidable within limits along the shaft 5 and biased to the right, such cylinder being provided with a truncated, rightward convergent, conical shoulder 16 which engages the inner edges of the flanges 12''' and is adapted upon movement of the control cylinder to the right to force the jaws 12' outwardly and thus expand the chuck 12. Movement of the control cylinder along shaft 5 is limited by the engagement of a screw 17 secured to the end member 6 with a longitudinal slot 18 provided in the control cylinder. The means for biasing the control cylinder to the right—i. e., to chuck expanding position—is a compression spring 19, hereinafter mentioned. For maintaining the control cylinder in a leftward position, so that the chuck may remain contracted for record application or other purposes, there is formed at the left-hand extremity of the control cylinder an annular lip 15' which is adapted to be engaged by a retaining pawl 21 when the control cylinder is in such leftward position. This pawl is pivoted to a lug 13'' formed on the collar 13, passes through a suitable aperture 21' provided in the adjacent clutch jaw 12', and is controlled in manner hereinafter set forth.

The record supporting means adjacent the left-hand end of shell 10 comprises a supporting and ejecting annular disc 22 having secured thereto or formed integrally therewith a rightward extending hub 23, this hub being slidably mounted on the shaft 5. Disc 22 has a short, rightward extending and slightly tapered annular portion or flange 22' adapted to fit the larger end of the bore of a record R. Leftward movement of the disc 22 along the shaft 5 is limited by impingement thereof against an annular disc 24 having a hub 24' extending leftward therefrom and secured to the shaft. Rightward movement of disc

22 is limited by impingement of the right-hand extremity of its hub 23 against the shell-supporting collar 11. A constant rightward urge is imparted to disc 22. For this purpose three leftward extending studs 25 are secured to the shell supporting collar 11, each stud 25 being provided with a head 25'; an outwardly extending flange 23' is provided at the right-hand extremity of hub 23 and is suitably apertured to pass freely about each stud 25 between the associated stud head 25' and the flange 23'.

The means for controlling the retaining pawl 21 comprise a horizontal rod 27 having at its right-hand extremity a hook 27' engaging the pawl. The rod 27 passes slidably through the shell-supporting collars 11 and 11' and loosely through the hub flange 23', and at its left-hand extremity is provided with an adjustable nut 28. Rod 27 is urged rightward by an expansion spring 29 disposed thereabout between the collar 11 and a pin 27'' secured to the rod 27. When responsive to its rightward bias the rod 27 urges pawl 21 clockwise about its pivot—i. e., to lip-engaging position. Nut 28, however, is so adjusted that as the supporting and ejecting disc 22 in its leftward movement approaches disc 24, the flange 23' will engage the nut so as to move the rod 27 leftward against its bias and thereby turn the pawl 21 to lip-releasing position.

Briefly the operation of the record support as above described may be outlined as follows: When no record R is positioned on the support it is intended that the control cylinder 15 by the engagement of its lip 15' by pawl 21, be maintained in its leftward position; that the chuck 12, under the action of spring 14, be held in a contracted condition; and that the supporting and ejecting disc 22, in response to the urge of springs 26, occupy its most rightward position. Cylindrical records employed for recording and reproducing dictation are usually provided with tapered bores, and in applying such a record R to the record support when the latter is conditioned as just described, that end of the record where the bore is largest is slipped leftward over the contracted chuck 12 and the shell 10, and into engagement with the disc 22 and its flange 22'. Further leftward movement of the record moves disc 22 with its hub 23 leftward, and as this disc approaches disc 24 pawl 21 is moved as above described, to release the lip 15'. Thereupon the control cylinder 15 moves rightward in response to the urge of spring 19 and the chuck 12 is expanded by the truncated conical shoulder 16. The then expanded chuck supports the record at its right-hand extremity, and by virtue of the leftward convergence of its conical surfaces 12'' prevents rightward movement of the record and hence of the supporting and ejecting disc 22. In this condition of the apparatus the record is supported coaxially with the shaft 5 and wholly clear of the shell 10.

The disc 24 is preferably vividly colored to provide an indicator of the completion of a record applying or mounting operation, it being understood that this operation is completed upon expansion of the chuck occurring when the left-hand record extremity has been brought to a predetermined distance from this indicating disc.

To release and eject the record from its support the control cylinder 15, with its truncated conical shoulder 16, is moved leftward. The chuck 12 thereupon immediately contracts under the action of the spring 14 encircling the jaws 12',

and the record is freed. The springs 26, having been compressed during the above-mentioned leftward movement of disc 22 and thus having stored energy, will now promptly release that energy by expanding, thereby moving the disc 22 rightward to its limit of such movement and ejecting or moving rightward the record R. In order that the chuck 12 may not re-expand before ejection or removal of the record, the leftward movement of the control cylinder 15 is desirably sufficient to move the lip 15' into position permitting its engagement by the pawl 21, and the arrangement is such that this engagement will occur in the earliest portion of the rightward or ejecting movement of disc 22. Upon such engagement the apparatus will be restored to the condition assumed at the beginning of this outline of its operation.

A record support having essentially the structure and mode of operation just described is disclosed in Patent No. 2,010,717 to Heinrich F. Max Gramann, dated August 6, 1935. In that patent the control means shown herein as the cylinder 15, is illustrated as terminating in a simple knob which comprises the portion of the control means intended for manual manipulation by the operator of the phonograph. According to the present invention the control cylinder may likewise terminate in a knob, which is herein designated by reference character 30. It is to be noted, however, that we provide this knob with a central cylindrical recess 30', the diameter of the right-hand portion of which is reduced to form the internal shoulder 30''.

To obviate the possibility of accidental leftward movement of the control cylinder 15 and consequent unintended chuck contraction and record ejection, we provide locking means for preventing such movement of the control cylinder, and means carried by the knob 30 and operative to release the locking means only when moved with respect to the knob. The releasing means is located centrally of the end of the knob, so that it will not be operated by accidental impacts against the knob assembly from most directions; while at the same time this location permits ready access of the fingers to the releasing means when operation thereof is deliberately intended.

The control cylinder locking means which we have illustrated herein comprises a ball-bearing lock interposed between the control cylinder and a shaft portion 5'' forming an extension of shaft 5. This shaft portion is most conveniently secured to the threaded portion 4' of the shaft 4, which as above noted, is operatively essentially integral with the shaft 5. Accordingly this shaft portion 5'' is shown as internally threaded and screwed onto the threaded shaft portion 4' and into engagement with the knurled nut 9, for which it may act as a lock nut. Internally carried by the control cylinder 15 and spacedly surrounding the right-hand portion of the shaft extension 5'', is an annular bearing 34 which may be termed a cone bearing by virtue of the truncated, rightward convergent, conical form of its interior surface 34'. The support of the cone bearing 34 on the control cylinder is preferably slightly loose; this bearing being longitudinally retained against appreciable leftward movement relative to the cylinder by a shoulder 15''' provided internally of the latter, and against rightward movement by a threaded washer 35 screwed into the end of the cylinder and the spacing washer 36 loosely fitting between the bearing and the washer 35. Disposed in the tapering annular recess formed be-

tween the shaft portion 5'' and the interior bearing surface 34' is an annular ball retaining member 32, in which are retained, preferably at equal angular spacings, three or more balls 33. Four such balls 33 are provided in the construction shown in the drawing. The balls are of a diameter intermediate the minimum and maximum radial distances between the shaft portion 5'' and the bearing surface 34'. The retaining member 32 is biased rightward by an expansion spring 20 surrounding the shaft portion 5'' and terminally engaging the nut 9 and the retaining member, and the rightward bias thus provided normally forces each of the balls 33 into contact with both the shaft portion 5'' and the bearing surface 34'—i. e., causes the balls to wedge lightly between such shaft portion and bearing surface. The locking action of this structure will be obvious: the control cylinder cannot move leftward without similar movement of the bearing 34, and the latter movement is balked by the wedging effect of the balls 33.

The means for releasing the control cylinder locking means at will comprises a button 37 carried within the knob 30. The button 37 is provided with an annular flange 37' which is adapted to engage against the internal knob shoulder 30''. When the flange 37' does engage shoulder 30'' the right-hand smaller face 37'' of the button is approximately flush with the outer end face of knob 30. The button 37 is formed with a releasing sleeve 38 which extends leftward from the center of the inner face of the button into the annular recess between shaft portion 5'' and bearing surface 34' and substantially into contact with the ball retaining member 32 if the latter has then fully responded to its rightward bias. The button 37 and releasing sleeve 38 will be prevented from appreciable leftward movement, in the absence of leftward pressure on the button, by virtue of the rightward bias on the ball retaining member 32. It is desirable, however, to dispose the expansion spring 19 between the outer end of the shaft portion 4' and the left-hand face of the button 37, as this effects a positive rightward bias of the button shoulder 37' against the knob shoulder 30'' and a resulting rightward bias on the control cylinder 15.

It will be apparent that if button 37 is moved leftward relative to the knob 30—i. e., inwardly of the knob—the releasing sleeve 38 will move the ball retaining member 32 leftward and thus displace the balls 33 from wedging position. So long as the button 37 is maintained slightly leftward of its normal position relative to the knob, the balls 33 will be maintained sufficiently displaced with respect to the bearing 34 to prevent their wedging locking action; and the knob may then be freely moved leftward for chuck contraction and record ejection. It is almost instinctive in the operation of moving the knob leftward to place one or more fingers centrally of the knob, and thus in the case of the construction illustrated, against the button surface 37''. It is accordingly very convenient to effect and maintain the required slight displacement of the button relative to the knob during deliberate knob manipulation.

The term "record" as used in this specification and in the appended claims, is intended to apply to a sound record tablet regardless of whether the same is blank or is provided with sound record grooves.

It will be understood that while we have illustrated and described our invention in a particular

form, and as applied to a particular record support, we wish to imply thereby no unnecessary limitation, and intend to express the scope of our invention in the following claims.

5 We claim:

1. The combination with a rotatable record support having record ejecting means applied thereto and rotatable therewith, of movable control means for said support carried thereby, said
10 ejecting means being responsive, when a record is carried by said support, to a predetermined movement of said control means; and means carried by the rotatable record support and associated with said control means for releasably locking the latter
15 against said predetermined movement thereof.

2. In combination in a record support: record ejecting means; movable control means, said ejecting means being responsive, when a record is carried by said support, to a predetermined movement of said control means; means for locking
20 said control means against said predetermined movement thereof; a knob for manipulating said control means; and means carried by said knob and movable relative thereto to release said
25 locking means.

3. The combination with a rotatable unitary structure adapted selectively to support and to eject a record, of movable control means therefor applied thereto and biased to maintain the same
30 in record supporting condition and arranged for movement at will to produce record ejecting action, and means carried by said rotatable structure and associated with said control means for releasably locking the latter against such movement thereof.
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4. The combination with a structure adapted selectively to support and to eject a record, of movable control means therefor biased to maintain the same in record supporting condition and arranged for movement at will to produce record
40 ejecting action, means associated with said control means for locking the same against such movement thereof, a knob for actuating said control means, and means carried by said knob and
45 movable relative thereto to release said locking means.

5. The combination with a rotatable unitary supporting structure for cylindrical records having record engaging means adapted for contraction and expansion, movable means biased to a position in which the same is operable to maintain said engaging means in expanded condition
50 and means operative to impart ejecting movement to a supported record in response to contraction of said engaging means; of means carried by said rotatable structure for releasably locking said movable means in the said biased position thereof whereby to prevent accidental operation of said
55 ejecting means.

6. In combination in a support for cylindrical records: record engaging means adapted for contraction and expansion; means operative to eject a supported record in response to contraction of said engaging means, a movable control knob
60 connected with said engaging means and arranged for movement at will to effect contraction thereof; means for locking said knob against such movement thereof, and means carried by said knob and movable relative thereto to release said
65 locking means.

7. In combination in a support for cylindrical records: a rotatable shaft; a chuck carried by said shaft and expansible and contractible to and from record supporting position, a member movable axially of said shaft to effect expansion and
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contraction of said chuck, and means interposed between said member and a portion of said shaft for releasably locking said member against chuck contracting movement.

8. In combination in a support for cylindrical records: a rotatable shaft, a chuck carried by said shaft and expansible and contractible to and from record supporting position, a member movable axially of said shaft to effect expansion and contraction of said chuck, means interposed between said member and a portion of said shaft for locking said member against chuck contracting movement, a knob for actuating said member, and means carried by said knob and movable relative thereto to release said locking means.
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9. In a support for cylindrical records, a shaft, a structure carried thereby and selectively adapted for record engagement and ejection, control means for said structure including a member movable longitudinally of said shaft, and means for securing said member against accidental movement in one direction comprising a releasable ball-bearing lock interposed between said member and a portion of said shaft.
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10. In a support for cylindrical records, a shaft, a structure carried thereby and selectively adapted for record engagement and ejection, control means for said structure including a member movable longitudinally of said shaft, means for securing said member against accidental movement in one direction comprising a lock interposed between said member and a portion of said shaft, a knob for actuating said member, a releasing button carried by said knob and arranged for movement relative thereto at will, and means for releasing said lock in response to such movement of said button.
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11. In a support for cylindrical records, a shaft, a structure carried thereby and selectively adapted for record engagement and ejection, control means for said structure including a member movable longitudinally of said shaft, a conical bearing carried by said member and forming with a portion of said shaft a tapered annular recess, a plurality of balls, biasing means normally wedging said balls into said tapering recess, and means operable at will to displace said balls from wedging position.
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12. In a support for cylindrical records, a shaft, a structure carried thereby and selectively adapted for record engagement and ejection, control means for said structure including a member movable longitudinally of said shaft, a knob for actuating said member, a conical bearing carried by said member and forming with a portion of said shaft a tapered annular recess, a plurality of balls, biasing means normally wedging said balls into said tapering annular recess, a releasing button carried by said knob and arranged for movement relative thereto at will, and means operable in response to such movement of said button to displace said balls from wedging position.
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13. In a support for cylindrical records, a shaft, a structure carried thereby and selectively adapted for record engagement and ejection, control means for said structure including a cylindrical member surrounding one end portion of said shaft and movable longitudinally thereof, a knob forming an extremity of said member, a conical bearing internally carried by said member and forming with a portion of said shaft an annular recess tapering toward said knob, a plurality of balls, biasing means normally wedging said balls into said tapering recess, a releasing button carried by said knob and arranged for movement in-
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wardly thereof at will, and means operable by said button and extending into said annular recess for displacing said balls from wedging position in response to such movement of said button.

5 14. The combination with a structure adapted selectively to support and to eject a record; a movable control means therefor biased to maintain the same in record supporting condition; a knob
10 for actuating said control means, said means being arranged for movement, in response to pres-

sure on said knob, to produce record ejecting action of said structure; releasable means for locking said control means against such movement thereof; a button centrally carried by said knob and arranged for movement inwardly thereof at will; and means responsive to such inward button movement, for releasing said locking means. 5

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