May 9, 1933. O. J. P. CRICK 1,907,501

TALKING MACHINE

Filed May 10, 1930 2 Sheets-Sheet 1

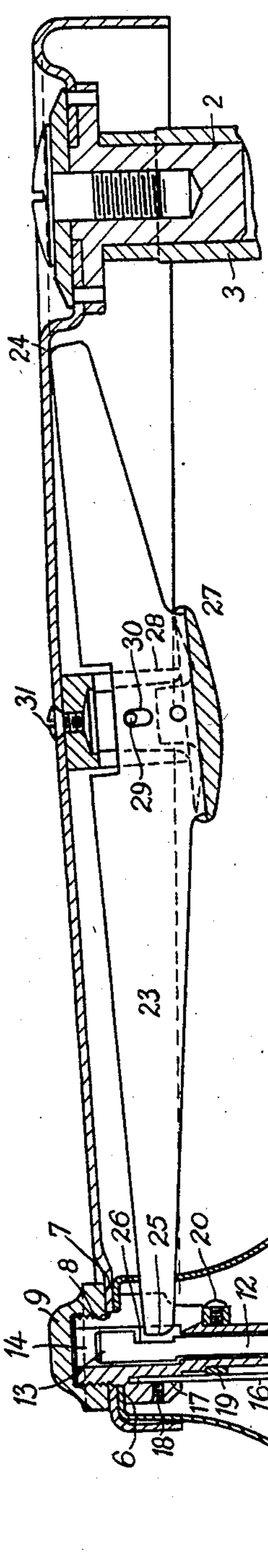

Fig. 1.

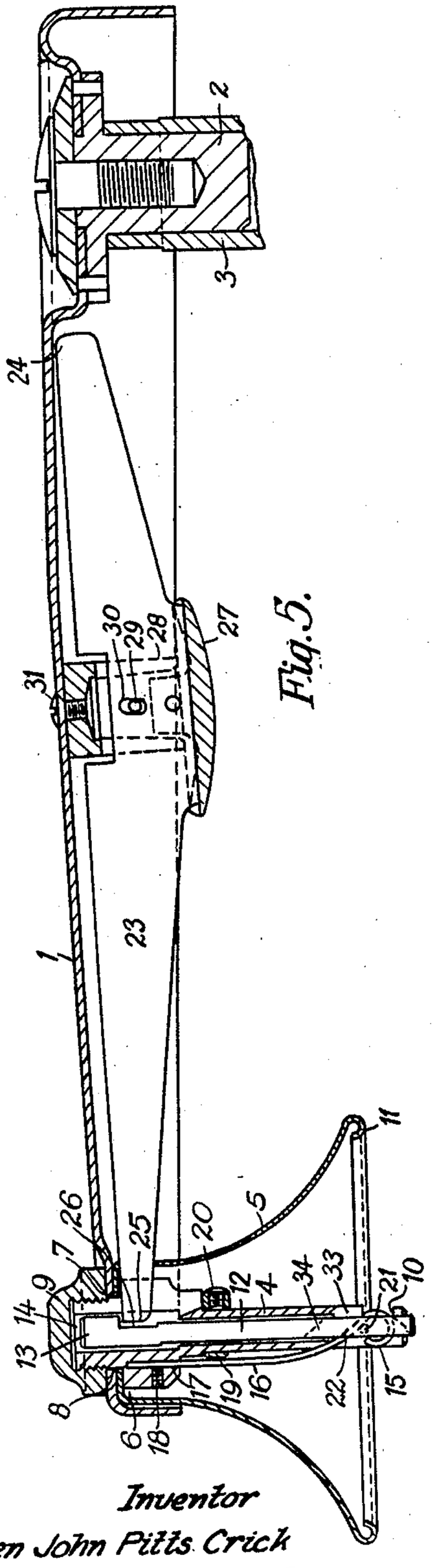

Fig. 5.

Inventor

Owen John Pitts Crick

by T. P. Goldsborough His Attorney.

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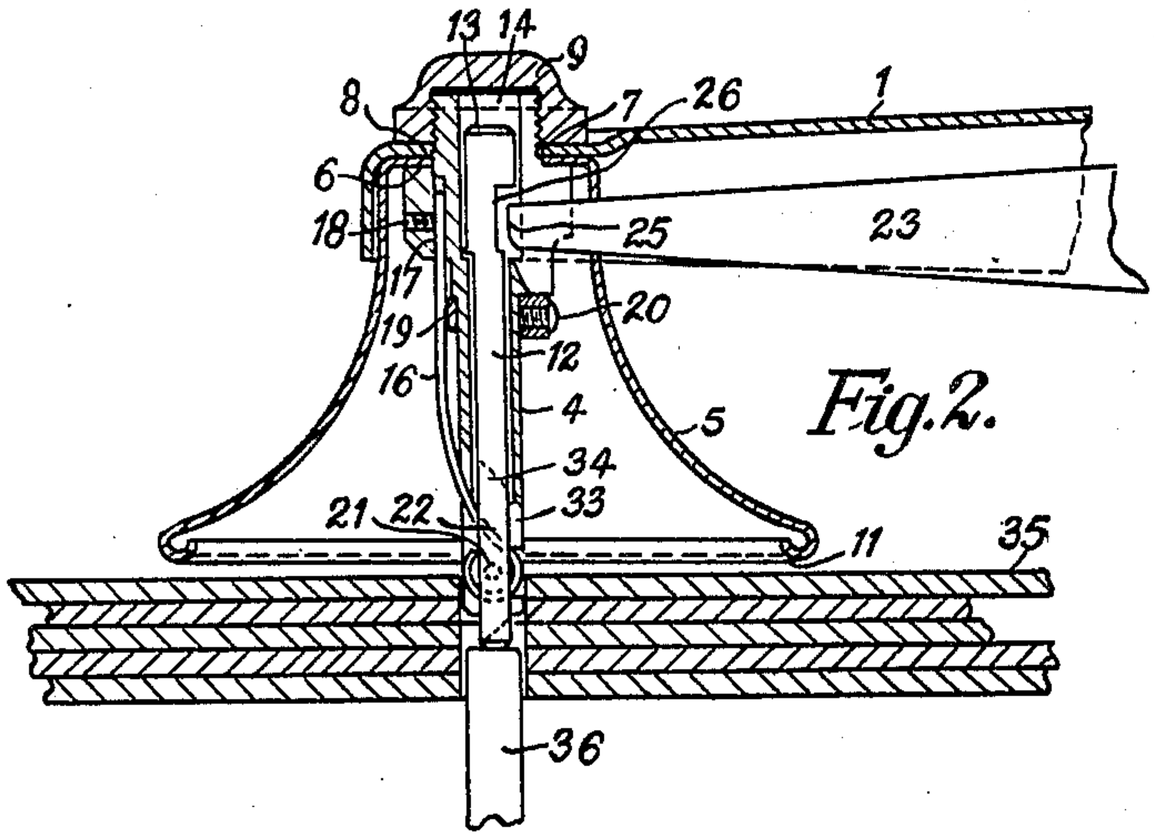

Fig. 2.

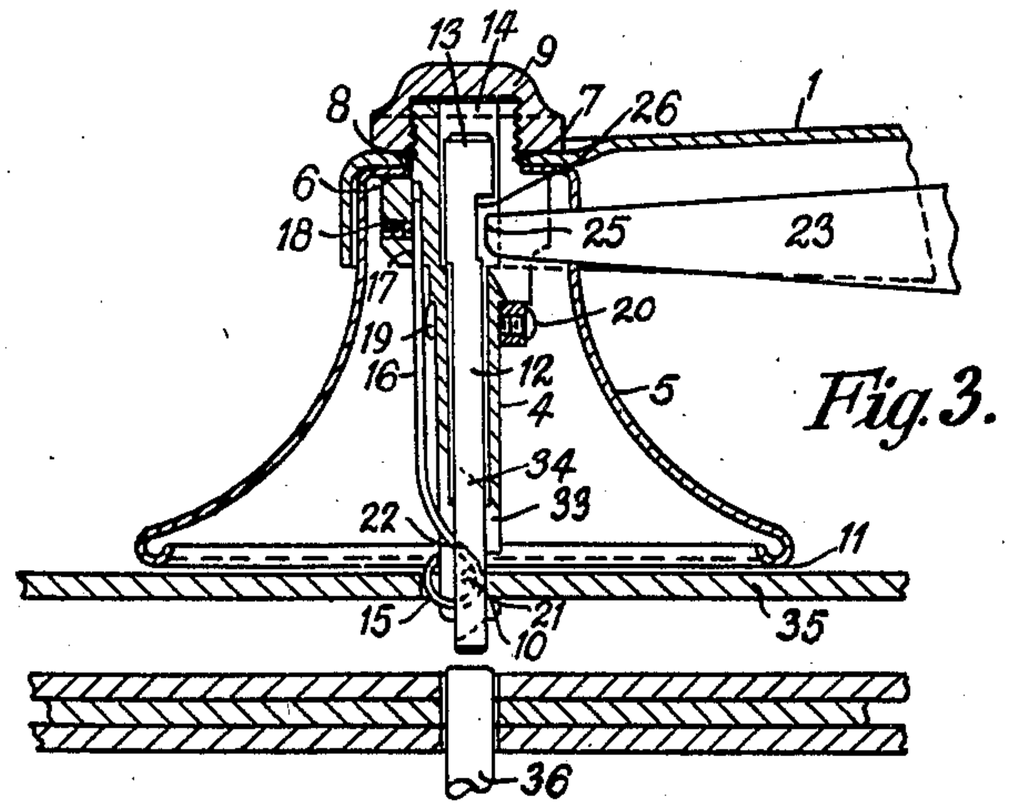

Fig. 3.

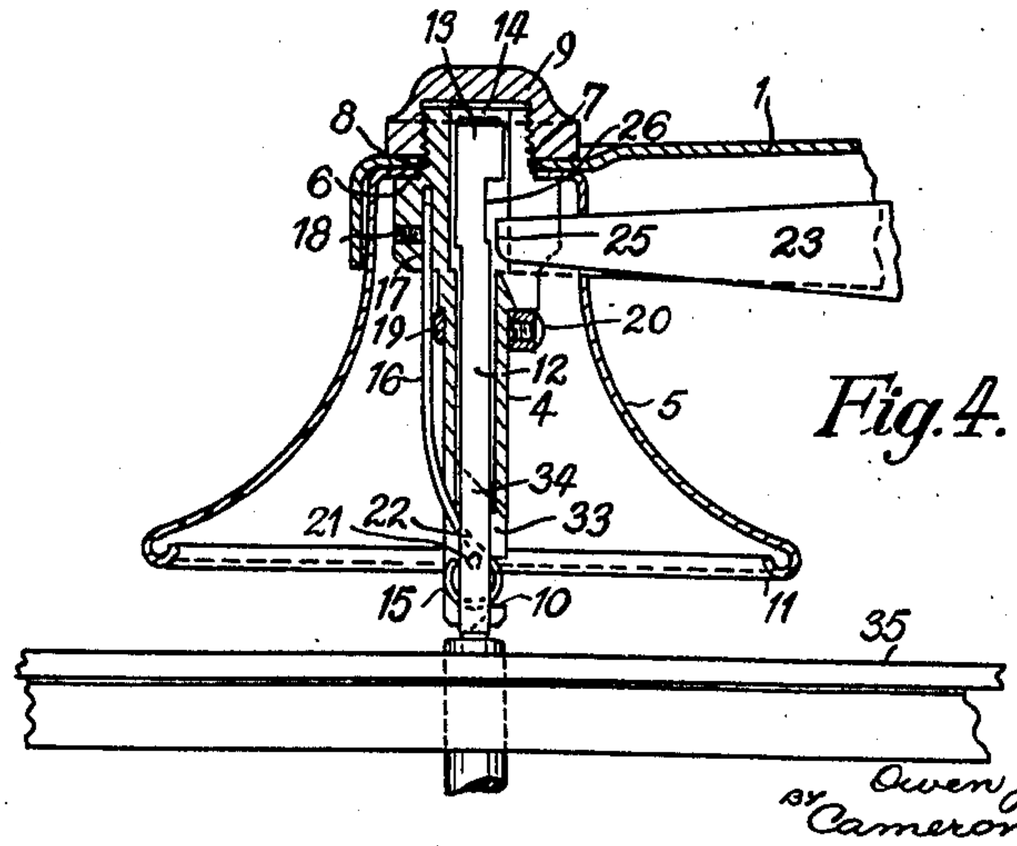

Fig. 4.

INVENTOR.
Owen John Pitts Crick.
BY Cameron, Kerkam & Sutton.
ATTORNEYS.

Patented May 9, 1933 1,907,501

UNITED STATES PATENT OFFICE

OWEN JOHN PITTS CRICK, OF LONDON, ENGLAND, ASSIGNOR TO VICTOR TALKING MACHINE COMPANY, A CORPORATION OF NEW JERSEY

TALKING MACHINE

Application filed May 10, 1930, Serial No. 451,428, and in Great Britain June 12, 1929.

This invention relates to improved means for holding disc talking machine records and in particular to improved means for holding disc records by engagement with their central apertures.

The device forming the subject of the invention is intended primarily for use with the record conveying mechanism of a magazine talking machine whereby a series of records are fed singly and in succession from a magazine to the playing position on the turntable, although it is to be understood that it may also be used for other purposes, such as retaining a record in position on the turntable of a talking machine.

The record holding device according to the present invention comprises a member having a recess formed in it and adapted to be inserted in the central aperture in the record, and a member movable with regard to the recessed member and adapted to be inserted with the recessed member in the central aperture in the record and after insertion to move said record with regard to the recessed member to engage a part of the edge of the central aperture of the record within the recess.

The invention is illustrated by way of example in the accompanying drawings as applied to a swinging conveyor arm adapted to transfer records singly from a pile in a magazine to the playing position on the turntable.

In the drawings

Fig. 1 is a view in sectional elevation of the conveyor arm and record holding device with the parts in the normal position.

Fig. 2 is a view in elevation of the record holding device about to engage the uppermost record of a pile.

Fig. 3 is a view in elevation showing a record completely engaged by the holding device.

Fig. 4 is a view in elevation showing the parts in the positions they take up to release the record from the holding device.

Fig. 5 is a view similar to Fig. 1 illustrating hand controlled means for operating the holding device.

Referring to the drawings (Figs. 1 and 5) an arm 1 in the form of an inverted channel shaped metal pressing is fixedly mounted at the upper end of a post 2 which is itself arranged for movement both vertically and horizontally in known manner in a suitable bearing sleeve 3.

At the free end of the arm 1 is fixedly secured a downwardly extending hollow rod 4 the external diameter of the lower end of which is such that it can enter within the central aperture of a record. Also at the end of the arm 1 is fixedly mounted a downwardly extending bell-shaped abutment member 5 surrounding the hollow rod 4. For the purpose of mounting the hollow rod 4 and the abutment member 5 in position on the arm 1 the rod 4 is provided with a shoulder 6 near its upper end and the part of the rod above the shoulder is screw threaded externally. This screw threaded part of the rod 4 is passed through an aperture 7 in the bottom of the abutment member 5 and a similar aperture 8 in the end of the arm and fixing of the rod 4 and abutment member 5 in position is effected by means of a nut 9.

The rod 4, near its lower end and on the side towards the post 2 is provided with a recess 10 of a vertical width slightly greater than the thickness of a record and the upper edge of this recess 10 lies in substantially the plane of the lower edge 11 of the abutment member 5.

A pin 12 is mounted for sliding movements within the interior of rod 4, said pin being provided with an enlarged head 13 housed within an enlarged portion 14 at the upper end of the passage through the rod 4 whereby the downward movement of the pin 12 is limited.

In the rod 4 and the pin 12 near their lower ends are formed slots 33 and 34 respectively, these slots lying in alignment with one another in the central vertical plane of the arm, so that the slot 33 in rod 4 bisects the recess 10. The slots 33 and 34 together form a housing for the hooked shaped end 15 of a stiff wire spring 16 anchored at its other end in a slot 17 in the

shoulder 6 on rod 4 by means of an anchoring screw 18.

The width of the hook 15 is substantially equal to the diameter of the rod 4 and in its normal or rest position projects in part from the slot 33 at the side of rod 4 away from recess 10 as shown in Fig. 1. The hook 15 can however be caused to move from the position shown in Fig. 1 to that shown in Figs. 2, 4 and 5 where it in effect fills the recess 10 in the rod 4 and in this position of the hook 15 the spring 16 is under tension. A collar 19 the position of which is adjustable longitudinally of the rod 4 through the medium of a locking screw 20 serves as an abutment for the spring 16 at any desired point intermediate the length of the latter, and this arrangement permits the desired restoring force of the spring 16 to be obtained.

A fixed pin 21 is arranged to lie transversely of the slot 34 in sliding pin 12 and in a position where it can engage the bent portion 22 of the spring 16 adjacent the hook 15 when the sliding pin 12 is suitably moved.

In operation, to feed a record 35 from the top of a centrally aligned pile (Fig. 2) the arm 1 is swung horizontally and lowered in known manner to engage the lower end of the rod 4 in the central apertures of the records at the top of the pile, the record centering pin 36, if used, being yieldingly mounted to recede before the downward thrust by the end of pin 12. As the end of the rod enters the aperture in the uppermost record, the hook 15 is caused, by engagement with the edge of the aperture, to recede into the slots 33 and 34 in the manner shown in Fig. 2, the spring 16 being thereby placed under tension. When however, the recess 10 in the rod 4 registers with the wall of the aperture in the top record, the pressure of spring 16 is exerted to move that record to the left in Fig. 2 and the record is now firmly engaged in the recess by the hook 15.

It will be noted that no sliding movement of the record next to the uppermost can take place as the top record slides over it, since the unrecessed lower extremity of the rod 4 is engaged within the central aperture of that record.

The uppermost record now held in recess 10 by hook 15 lies in contact with or close to the edge 11 of the abutment member 5, so that no tipping movements of the record can take place as the arm 1 is raised and swung to transfer the record to the turntable or playing position.

The arm 1 having reached the position where the record is over the turntable, said arm is lowered in known manner and during the lowering movement the transferred record is released from the rod 4 and permitted to fall on the turntable. The release of the record is effected as follows:

As the arm 1 is lowered, the lower end of pin 12 engages with the upper end of the central turntable spindle. Further downward movement of arm 1 therefore, results in the pin 12 being thrust longitudinally of the rod 4. By this means the transverse pin 21 is caused to engage the bent portion 22 of spring 16 in such a manner that the spring is deflected and the hook again caused to withdraw into the slots 33 and 34, at the same time pushing against the wall of the central aperture in the record and removing it from recess 10. The record thereupon slides off the rod 4, falling on to the turntable with its central aperture over the turntable spindle, in which position it is ready for playing.

Means are also provided to permit a record held on rod 4 to be removed by hand.

For this purpose there is provided a lever 23 (Figs. 1 and 5) in the form of a flat plate, one end 24 of which contacts with the underside of the arm 1, while the other end 25 projects through a slot in the enlarged part 6 of the rod 4 and into a recess 26 formed in the enlarged upper end of pin 12. The size of recess 26 is such that the pin 12 is capable of the movements necessary for the automatic operation described above independently of lever 23. The lever 23 intermediate its length is provided with a finger knob 27 and the part of the lever 23 above the knob engages within a slot arranged diametrically of a short hollow boss 28 fixedly mounted on the under side of the arm 1 by means of a screw 31. A transverse fixed pin 29 extends across the slot in member 28 and through an elongated slot 30 in the lever 23 to retain the latter in position while permitting limited movements thereto about the fulcrum formed at the point of contact of the end 24 of the lever with the underside of arm 1.

It will readily be seen that by grasping the arm 1 and lifting the knob 27, the pin 12 can be raised within rod 4 to move hook 15 in the manner described above to disengage a record from recess 10.

I claim:

1. A device for holding a disc talking machine record of the kind adapted to engage in the central aperture of the record, comprising a member having a recess formed in it and adapted to be inserted in the central aperture in the record, and a member movable with regard to the recessed member and adapted to be inserted with the recessed member in the central aperture in the record and after insertion to move said record with regard to the recessed member to engage a part of the edge of the central aperture of the record within the recess.

2. A device according to claim 1, comprising a movable member adapted to be inserted together with a recessed member in the

central aperture of a record, said movable member when moved in one direction engaging the wall of the record aperture and moving said record to engage a part of the edge of the central aperture in the recess and when moved in the other direction engaging another part of the wall of the record aperture to remove the record from engagement in the recess.

3. A device according to claim 1, wherein an abutment member is provided in a fixed position with regard to the recessed member which abutment member contacts with or lies close to the surface of a record, engaged in the recess, to prevent rocking movements of said record.

4. A device according to claim 1, wherein the recessed member is formed by a rod having the recess formed at one side near its free end and a diametrical slot leading from the recess through the rod and forming a housing for the movable member, said movable member normally protruding from said slot and being arranged to withdraw thereinto, and to in effect fill the recess through contact with the record as the rod is inserted in the aperture in a record.

5. A device according to claim 1, wherein the movable member is in the form of a ring or hook carried at the end of an anchored spring rod, the external width of said ring or hook being substantially equal to the diameter of the recessed and slotted rod.

6. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a transfer arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for successively depressing said spindle at least the thickness of said outermost record, and means for moving said outermost record laterally of said group of records.

7. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said record, record transfer mechanism comprising a swinging arm, means carried by said arm adapted to engage said spindle to move the same at least a distance sufficient to clear the outermost record of said group, and means on said arm for engaging and moving said outermost record laterally of said group upon clearance of said spindle therefrom.

8. In an automatic phonograph to the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a transfer arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for periodically depressing said spindle at least the thickness of successive outermost records, and means for moving said outermost record laterally of said group of records.

9. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising an oscillatory arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for causing said first-named means to register axially with said spindle, means for successively depressing said spindle at least the thickness of said outermost record, and means for moving said outermost record laterally of said group of records.

10. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising an oscillatory arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for causing said first-named means to register axially with said spindle, means for moving said arm in one direction to depress said spindle at least the thickness of said outermost record, means carried by said first-named means for engagement with said outermost record, and means for moving said arm laterally of said group of records to remove said outermost record therefrom.

11. In an automatic phonograph of the type adapted to support a stack of records in superposed relation and having a movable spindle upon which the records of said stack may be threaded, record transfer mechanism including an oscillatably mounted arm, means on said arm adapted to enter the center opening of a record, means for rendering said last-named means operative to enter the opening in the outermost record of said stack and thereby depress said spindle at least the thickness of said outermost record, and means for moving said arm laterally of said stack to remove said outermost record therefrom.

12. In combination, means for supporting a stack of records, record transfer mechanism including a pivotally mounted member, means carried by said member adapted to enter the center opening of a record, means for rendering said last-named means operative to enter the opening in the outermost record of a stack of records when said stack is held by said supporting means, and means cooperating with said pivotally mounted member for moving said outermost record laterally of said stack.

13. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle

movable relative to said records, record transfer mechanism including an oscillatably mounted arm, means carried by said arm adapted to enter the center opening of a record, means for causing said last named means to enter the opening in the outermost record of said group of records, means for moving said arm in one direction to depress said spindle at least the thickness of said outermost record, and means for moving said arm laterally of said group of records to remove said outermost record therefrom.

14. In an automatic phonograph of the type adapted to support a stack of records in superposed relation and having a movable spindle upon which the records of said stack may be threaded, record transfer mechanism including a swinging arm, means carried by said arm adapted to be centered over the center opening in the outermost record of said stack upon movement of said arm in one direction, means for moving said arm in another direction to cause said first-named means to depress said spindle at least the thickness of said outermost record, and means moving said arm laterally of said stack of records to remove said outermost record therefrom.

15. In an automatic phonograph of the type adapted to support a group of records in superposed relation and having a movable spindle upon which the records of said group may be threaded, record transfer mechanism including an oscillatably mounted arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for moving said arm in one direction for depressing said spindle at least the thickness of the outermost record of said group of records, means for moving said outermost record laterally of said group of records to cause said first-named means to engage the edge of the central opening therein and means for moving said arm in another direction for displacing said outermost record from said group of records.

16. In combination, means for supporting a stack of records, record transfer mechanism including a pivotally mounted member, means carried by said member adapted to enter the center opening of a record to engage the edge of said center opening, means for causing said last named means to enter the opening in the outermost record of a stack of records, means for moving said outermost record laterally of said stack into supporting relation with said second named means and means to thereafter impart motion to said member to displace said outermost record from said stack.

17. In an automatic phonograph of the type adapted to support a group of records in superposed relation and having a retractable spindle upon which the records of said group may be threaded, record transfer mechanism including an oscillatably mounted arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for lowering said arm to retract said spindle at least the thickness of the outermost record of said group of records, means associated with said first named means for moving said outermost record laterally of said group of records to engage said first named means, means for elevating said arm, and means for thereafter moving said arm laterally to displace said outermost record from said group of records.

18. In combination, means for supporting a stack of records, record transfer mechanism including a pivotally mounted member, means carried by said member adapted to enter the center opening of a record, means for causing said last named means to enter the opening in the outermost record of a stack of records on said supporting means, and means associated with said second named means for moving said outermost record into supporting relation therewith.

19. In combination, means for supporting a stack of records, record transfer mechanism including a pivotally mounted member, means carried by said member adapted to enter the center opening of a record and including a record supporting portion, means for causing said last named means to enter the opening in the outermost record of a stack of records on said supporting means, means cooperating with said second named means for moving said outermost record into supporting relation with said supporting portion, and means pivotally carried by said member for releasing said outermost record from said second named means.

20. In combination, means for supporting a stack of records, record transfer mechanism including a pivotally mounted member, means carried by said member adapted to enter the center opening of a record, means for causing said last named means to enter the opening in the outermost record of a stack of records on said supporting means, means carried by and cooperating with said second named means for moving the outermost record of said stack laterally thereof subsequent to the entry of said second named means in said center opening, and means for subsequently moving said pivotally mounted member to displace said outermost record from said stack.

21. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a transfer arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for successively

depressing said spindle at least the thickness of said outermost record, means for moving said outermost record laterally of said group of records, and means for thereafter moving said transfer arm to displace said outermost record from said group of records.

22. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a transfer arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for successively depressing said spindle at least the thickness of said outermost record, means associated with said second named means for supporting said outermost record, means for moving said outermost record laterally of said group of records into supporting relation with said supporting means, and means for thereafter moving said transfer arm to displace said outermost record from said group of records.

23. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a swinging arms, means carried by said arm adapted to engage said spindle to move the same at least a distance sufficient to clear the outermost record of said group, means on said arm cooperating with said first named means for engaging and moving said outermost record laterally of said group upon clearance of said spindle therefrom, and means for thereafter moving said arm to displace said outermost record from said group of records.

24. In an automatic phonograph of the type including means for supporting a group of superposed records threaded on a spindle movable relative to said records, record transfer mechanism comprising a transfer arm, means carried by said arm adapted to enter the center opening of the outermost record of said group, means for successively depressing said spindle at least the thickness of said outermost record, means associated with said second named means for supporting said outermost record, means for moving said outermost record laterally of said group of records into supporting relation with said supporting means, means carried by said arm adapted to cooperate with said supporting means to maintain a record against rocking movement thereon, and means for thereafter moving said transfer arm to displace said outermost record from said group of records.

In testimony whereof I have signed my name to this specification.

OWEN JOHN PITTS CRICK.