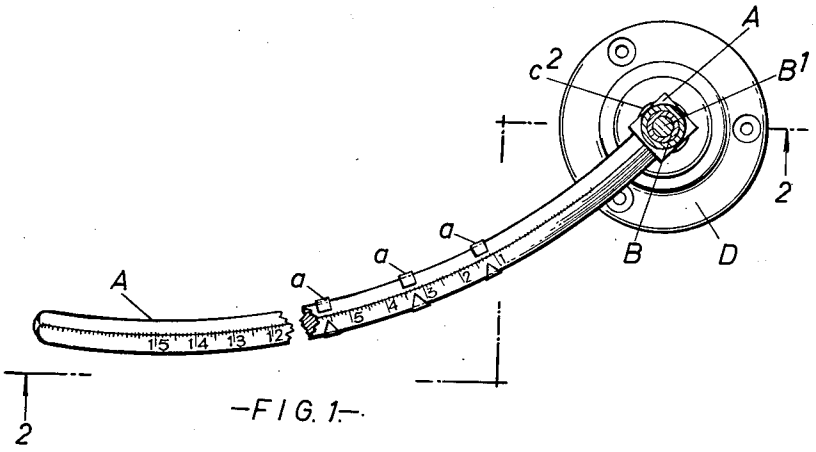
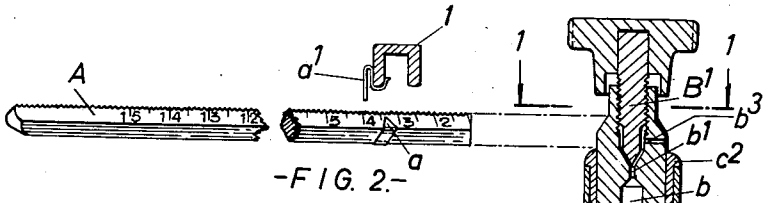
Feb. 13, 1962 A. G. CARROLL 3,021,142

GRAMOPHONE PICK-UP MECHANISM

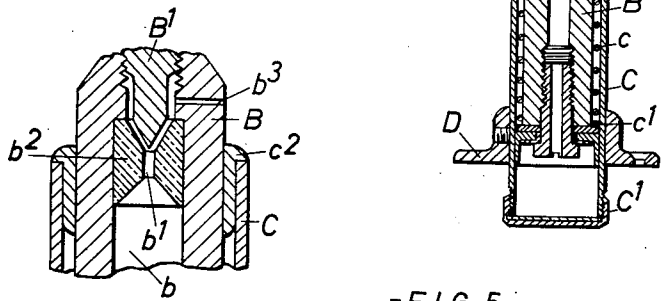
Filed March 20, 1957



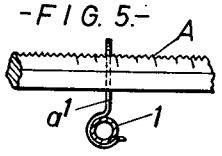
-FIG. 1.-



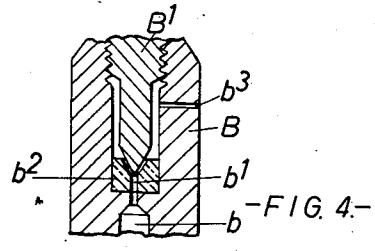
-FIG. 2.-



-FIG. 3.-



-FIG. 5.-



-FIG. 4.-

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United States Patent Office 3,021,142 Patented Feb. 13, 1962

3,021,142

GRAMOPHONE PICK-UP MECHANISM

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Filed Mar. 20, 1957, Ser. No. 647,434
7 Claims. (Cl. 274—1)

This invention relates to improvements in gramophone pick up mechanism.

Difficulty is experienced in lowering a gramophone pick up arm on to a record without damage to the sound track or in the raising of the pick up arm therefrom and the possibility of damage is greatly increased with records known as long playing records. Also difficulty has been experienced in locating the arm at any particular portion of a record.

The object of the present invention is the provision of an arm controlled by a dash pot mechanism for lowering the pick up arm vertically on to the record, and providing a means of locating a required part of a record and then locating the pick up at that point.

According to the invention an arm or rod extending horizontally above a gramophone turntable is carried by a retarded plunger so that a pick up arm resting on or suspended from the arm or rod is lowered gently on to a record on the turntable and is raised vertically therefrom by lifting the arm or rod.

The invention will be described with reference to the accompanying drawings:

FIG. 1 is a plan of the device partly in section on line 1—1, FIG. 2,

FIG. 2 is a section on line 2—2, FIG. 1,

FIG. 3 is an enlarged detail section of part of FIG. 2,

FIG. 4 is a similar view of a modified arrangement,

FIG. 5 is a detail view showing a further arrangement for supporting the arm.

An arm or rod A is preferably curved substantially to the arc of a circle struck from the pivot of the pick up arm and mounted on a vertical plunger B sliding in a cylinder C carried by the frame D of the gramophone.

The plunger B is preferably of square or similar section to prevent rotation thereof in the cylinder C and may be formed with a central bore *b* to allow air to enter the cylinder as the plunger is raised. The cylinder is formed with a spring *c* surrounding the plunger and bearing at its lower end on a flange or washer c^1 secured to the lower end of the plunger by which the plunger is lowered gently under the action of the spring *c* expelling air from the cylinder through the bore *b* in the plunger B and through small bore b^3 in the side of the plunger B. The upper end of the spring *c* bears against a sleeve c^2 forming a bearing in the cylinder for the plunger B.

A screwed valve B^1 is provided in the head of the plunger adapted on rotation to close a capillary bore b^1 in the bore *b* therein and thereby lock the plunger B at any point on its travel. The capillary bore b^1 may be formed in a nylon valve seating b^2 inserted into the upper end of the bore *b* (FIG. 3).

The lower end of the cylinder C may be closed by a screw cap C^1.

The rod or arm A may be serrated along its upper edge and calibrated and may be provided with cursors *a* to indicate the position for resting the pick up arm 1 thereon for records of differing diameters.

The pick up arm 1 is fitted with clips a^1 having a knife edge which will locate in the serrations on the rod A to allow for indexing the arm accurately at any chosen position. Various patterns of clips a^1 will suit different types of pick-up arm which may rest on the rod or be suspended below the rod. The clips a^1 are mounted on the arm A at the appropriate position above the record and the valve is then opened. The plunger B is lowered

in the cylinder C by the spring *c* to apply the stylus gently onto the record. The pick up arm then moves in the normal manner above and clear of the rod or arm A whilst the record rotates below the rod or arm A and out of contact therewith. To remove the stylus from the record the rod or arm A is lifted to re-engage the pick up arm 1, further lifting of the rod or arm A raising the pick up arm 1 vertically from the record.

With long playing records many of which contain more than one record the position of the pick up arm 1 is noted and marked by a cursor *a* and the stylus may subsequently be lowered at the correct position for the replaying of the record without the possibility of damage to the sound track on the record.

Alternatively the plunger B may pass through a friction grip in a plastic moulding or spring metal pressing 1 arranged in the cylinder in place of the washer *c* or by passing the plunger B through a resilient bush to obviate the necessity for the valve B^1. The plunger may then be lifted or lowered manually.

I claim:

1. In a gramophone assembly having a rotatable turntable adapted to receive a record and a pick-up arm pivotally mounted for movement over the turntable and flexibly mounted for raising and lowering movement with respect to the turntable, an elongated control arm for lowering the pick-up arm onto a record on the gramophone turntable and for lifting the pick-up arm therefrom, support means fixed to said pick-up arm and carried by said control arm to enable said control arm to support said pick-up arm for raising and lowering said pick-up arm, an air cushioned-controlled plunger non-rotatably mounted on said assembly and rigidly connected to one end of said control arm to support the control arm in a position to extend over the turntable, said control arm being of sufficient length to support the pick-up arm during lowering thereof onto a record on the turntable and lifting of the pick-up arm therefrom at any point on said record, and means mounting and guiding said plunger to one side of said turntable for movement limited to vertical displacement with respect to the turntable during raising and lowering movement of the pick-up arm, said mounting and guiding means comprising a cylinder having a closed bottom and an open top, said plunger being slidably received in said cylinder from the top thereof; and means carried by said plunger providing for a gradually depletable air cushion between said plunger and the bottom of said cylinder, said plunger and said mounting and guiding means cooperating with said support means to allow said control arm to continue to lower after said pick-up arm engages said record, and said support means being arranged relative to said control arm to become detached therefrom when said control arm continues to lower after said pick-up arm engages said record to thereby allow said pick-up arm to ride clear of said control arm.

2. In the gramophone assembly defined in claim 1, said control arm being curved on an arc substantially concentric with the pivotal center of the pick up arm and being longitudinally calibrated according to different starting positions of the pick up arm in its traverse of a a record on the turntable.

3. In the gramophone assembly defined in claim 2, a cursor mounted for movement along said control arm and cooperative with the calibrations thereon to indicate the starting position of a record.

4. In a gramophone assembly having a rotatable turntable adapted to receive a record and a pick-up arm pivoted for movement over said turntable and flexibly mounted for raising and lowering movement with respect to the turntable, an elongated control arm supporting said pick-up arm for lowering said pick-up arm onto a

record on the gramophone turntable and for lifting the pick-up arm therefrom at any point on said record, a cylinder formed with an open top and a closed bottom, means for rigidly mounting said cylinder in upright position in the assembly at a side of the gramophone turntable, a plunger in said cylinder, means non-rotatably slidably mounting said plunger for movement limited to axial displacement within said cylinder, means connecting said plunger rigidly to an end of the control arm to support the latter in a position extending over the turntable for supporting the pick-up arm, and valve means operatively cooperating with said cylinder and plunger to provide an air cushion between said plunger and the bottom of said cylinder to establish a dashpot action to retard descent of the control arm and pick-up arm towards a record on the turntable.

5. In the gramophone assembly defined in claim 4, means for adjusting said means for varying the effectiveness of said dashpot action.

6. In a gramophone assembly having a rotatable turntable adapted to receive a record and a movable pick up arm adapted to extend over the record, a curved elongate control arm for lowering the pick up arm onto a record on a gramophone turntable and for lifting the pick up arm therefrom at any point on said record and having upwardly facing serrations, mounting means fixed to said pick-up arm and having a knife edge arranged to depend into said serrations to enable said control arm to detachably support said pick-up arm, a cylinder formed with an open top and a closed bottom and having means for rigidly mounting it in an upright position at a side of the gramophone turntable and a plunger slidable in the said cylinder, a washer at the lower end of the plunger

for guiding the plunger axially of the cylinder, the plunger extending beyond said cylinder at the top thereof and being connected rigidly to one end of the control arm to support the latter in a position extending over the turntable for supporting the pick up arm, means providing a capillary relief bore in the head of the plunger and an adjustable valve adapted to restrict said capillary bore in the plunger to vary the rate of movement thereof, the said cylinder and plunger cooperating with an air cushion between said plunger and the closed bottom of said cylinder to provide a retarding action to cushion the descent of the control arm and pickup arm towards the record on the turntable.

7. The assembly as defined in claim 1 wherein said control arm is provided with upwardly facing serrations and said support means is provided with a knife edge arranged to depend into a selected one of said serrations for supporting said pick-up arm with respect to said control arm.

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