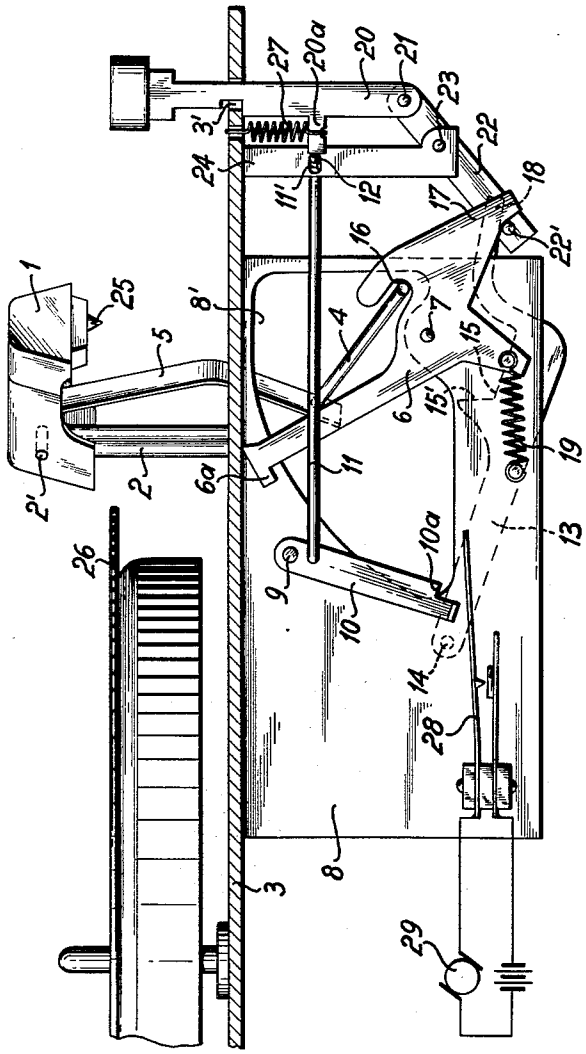
Nov. 22, 1960 H. ZIMMERMANN ET AL 2,961,242

DEVICE FOR MOVING THE PICK-UP OF RECORD-PLAYERS

Filed March 31, 1958 3 Sheets-Sheet 1

FIG. 1



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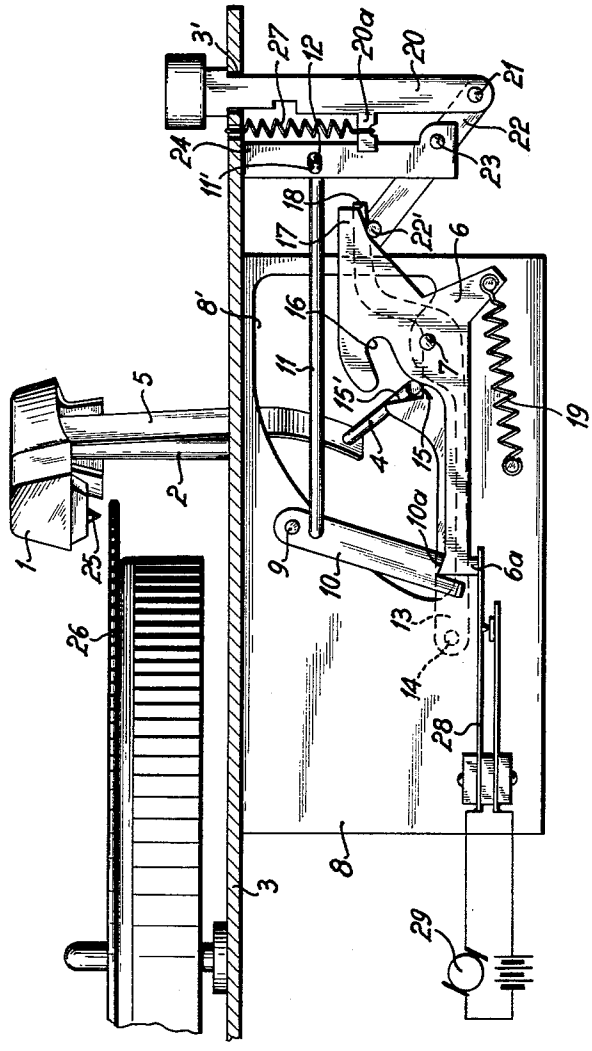
BY Mosterm & Hollis,
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DEVICE FOR MOVING THE PICK-UP OF RECORD-PLAYERS

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FIG. 2



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DEVICE FOR MOVING THE PICK-UP OF RECORD-PLAYERS

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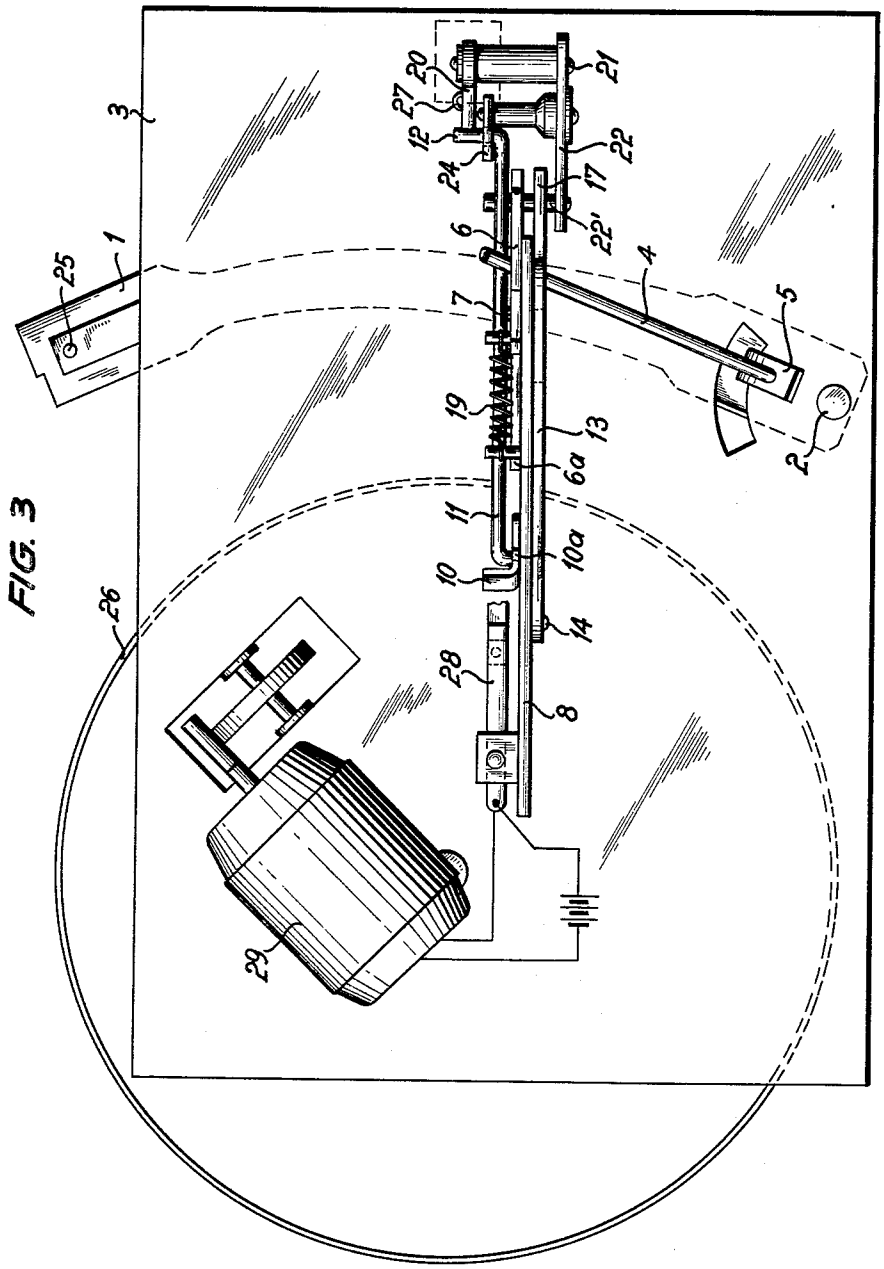


FIG. 3

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2,961,242

DEVICE FOR MOVING THE PICK-UP OF RECORD-PLAYERS

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6 Claims. (Cl. 274—14)

For the reproduction in phonographs, the pick-up of record-players has to be moved from an initial position as far as to the starting groove of the record for being able to be put into said groove. Thereafter, said pick-up is conducted by the record groove of the rotating record to the end or final groove. At the end, it has to be raised from said end groove and then returned into its initial position.

It requires much time and it is rather difficult to carry out said procedure by hand, and it very easily results in damages to the record. Therefore, various devices are known which are adapted to carry out said procedure automatically.

The invention relates to such an automatic device which is simply constructed and which prevents damages of the record in placing the pick-up upon the record and in removing it therefrom.

It is a further object of the invention to construct the automatic device in such a manner that the reproduction is started by means of a manually operated control member whereas the following steps of procedure are carried out automatically.

It is a further object of the invention to arrange and to construct the manually operated member and the automatic control device in such a manner that, by operating the manually operated member, said member will load a spring accumulator which is able to supply the driving energy required for the performance of the automatic procedures.

It is a further object of the invention, to arrange and to construct the manually operated member and the automatic control device in such a manner that by actuating the manually operated member in a second direction of movement it is possible to interrupt the reproduction and to return the pick-up into its initial position before the reproduction process is finished.

Finally, it is an object of the invention, to construct the device for moving the pick-up in such a manner as to very solid and to secure the pick-up against any undesired sliding movements, also in an oblique position of the record-player.

In the following, the invention is diagrammatically illustrated by way of example in the accompanying drawings.

In these,

Figure 1 is the front view of the inventive device with all parts in their initial positions;

Figure 2 is a similar view, although with the starting key being pressed down;

Figure 3 is a view of the device from below.

The device is provided with a pick-up 1, the vertical swivelling axis 2 of which is firmly connected to a base plate 3. The horizontal axis 2' of the pick-up 1 is mounted at the upper end of the axis 2 so as to be horizontally rotatable. A control pin 4 is rigidly connected to the pick-up 1 by means of a downwardly projecting angular supporting member 5. The control pin 4 co-operates with a multi-arm control lever 6 which is rotatable about a

pin 7. Said pin is mounted at the front side of a vertical plate 8 which is connected to the base plate 3 in any manner, e.g. by welding. At the same side of said plate 8 which is provided with an opening 8', a ratchet 10 is pivotally mounted by means of a pin 9, said ratchet 10 having a stop 10*a* at the lower end. Furthermore, to said ratchet is linked a connecting rod 11 the right-hand free end 12 of which is bent forwardly at a right angle. At the back of the plate 8 a safety lever 13 is mounted so as to be rotatable about an axial pin 14. At the upper end, the safety lever 13 is provided with an approximately longitudinally projecting edge 15, an edge 15' projecting upwardly in oblique direction, and a right-hand arm 18. The multi-arm control lever 6 has at the left-hand side a long arm 6*a* with a short projection, furthermore, at the upper side a control cam 16, and, finally, at the right-hand side a projection 17. Said control lever 6 is drawn along in clockwise direction by means of a spring 19 being mounted at the front side of the plate 8. At the right-hand side of the base plate 3, there is arranged a starting key 20 the shaft of which projects downwardly and extends through a slot 3' of the base plate 3.

At the lower end of the shaft of the key 20 is linked a double-armed lever 22 by means of a pin 21. Said lever 22 carries a control pin 22' at its right-hand free end, and it is, by means of an axial pin 23, pivotally mounted at a supporting member 24 being rigidly mounted at the base plate 3. Said member 24 is provided with a slot 11' through which projects the angularly bent end 12 of the connection rod 11. The key shaft 20 is provided at its left-hand side with a nose 20*a*, at which is fastened a spring 27 retracting the key 20 up to its initial position.

The pick-up 1 is, in usual manner, provided with a tone needle 25, e.g. a sapphire pin, which may engage in the record 26.

An electric motor 29 which may be switched on and off by means of spring contacts 28 serves to drive the rotary disc carrying the record 26.

The device hereinbefore described works as follows: At pressing down the starting key 20, the lever 22 will be pivoted in clockwise direction, and its control pin 22' being in touch with the projection 17 of the control lever 6 will swivel said lever 6 against the force of the spring 19 from the position according to Figure 1 upwardly into the position according to Figure 2. During said swivelling, the control cam 16 will carry the control pin 4 and together with it the pick-up 1 upwardly and to the left to the middle point of the cam 16 from where the control pin 4 will slide downwardly to the left.

At the same time as the lever 22, the safety lever 13 is rotated about the axial pin 14 in counterclockwise direction, its right arm 18 being lifted by the control pin 22' of the lever 22.

The control pin 4, in sliding downwardly along the control cam 16 meets the edges 15, 15' of the safety lever 13 and thus it is secured in this position. At this position of the control pin 4 and of the pick-up 1, the tone needle 25 is situated for a short time above the starting groove of the record 26.

The control lever 6 is adjusted in such a manner that, at its pivoting movement, its left-hand arm 6*a* slides along the right-hand edge of the ratchet 10 and turns it slightly to the left. At the end of said pivoting movement, an upper nose of said arm 6*a* engages in the stop 10*a* of the ratchet 10, so that it is locked in the position now obtained—see Figure 2. In said position, the short lower projection of the arm 6*a* presses against the upper spring of the pair of contact springs 28, so that the motor 29 is switched-on.

As soon as the motor 29 is moving, the starting key 20 is released. It moves upwardly under the effect of the spring 27 and it turns the lever 22 in anti-clockwise

direction, so that the right arm of the safety lever **13** also moves downwardly. However, during a short time its edge **15'** prevents the control pin **4** from moving downwardly and to the left. As soon as the edge **15'** leaves the control pin **4**, said pin is released to move further. Now, the pick-up **1** puts the needle **25** into the starting groove of the record **16**, and the pick-up **1** as well as the control pin **4** move freely to the left during the reproduction.

When the needle **25** reaches the end groove of the record **26**, the pick-up **1** has moved the control pin **4** so far to the left that said pin **4** pushes the ratchet **10** to the left. Thus the control lever **6** is released and, under the effect of the spring **19**, it returns into its initial position. During said movement, at first it opens the motor current at the contact springs **28**. Then its left arm **6***a* raises the control pin **4** and the pick-up **1** upwardly. As the control pin **4** slides along the control cam **16**, the two parts are carried to the right. At the end of the described backward movement, the control pin **4** and the pick-up **1** are brought back into their starting positions according to Figure 1.

During the reproduction, the starting key **20** is in rest position according to Figure 1. If it is desired to interrupt the reproduction, the starting key **20** is turned against the force of the spring **27** to the left. Thus its left projection **20***a* presses against the angularly bent end **12** of the rod **11**. Said rod **11** pivots the ratchet **10** to the left, the control lever **6** thus being released.

Now, in the same manner as just described, the motor **29** is switched-off, the control pin **4** and the pick-up **1** are moved back into their initial position.

What we claim is:

1. A device for controlling the pick-up of record players, comprising a housing, a pick-up provided with a needle, a manually operated starting member, a control lever swingable by said starting member against the force of a spring from a starting position to an end position, a ratchet attached to the housing for locking the control lever in its end position and a supporting member attached to the pick-up, the control lever being provided with control cam means for lifting the pick-up and for leading said pick-up to the starting groove of a record and for emplacing it on said groove, said cam means cooperating with said supporting member, means cooperating with said supporting member and said ratchet for releasing said ratchet, thus releasing said control lever for swiveling back into starting position under the effect of the spring.

2. The device according to claim 1, wherein there is further provided a safety lever swingable simultaneously with said control lever by means of said manually operated starting member and arranged next to said control lever, said safety lever comprising a first control edge engaging with said control cam, said control lever and said supporting member, to hold the supporting member and the pick-up at a level at which the needle of the pick-up is located closely above the groove.

3. The device according to claim 2, wherein said safety lever is provided with a second control edge secured to said first edge at right angles, the lateral position of said control edge being so selected that it holds the supporting member and thereby the pick-up in a swivel position in which the needle of the pick-up is located exactly above the starting groove.

4. The device according to claim 1, further provided with means for releasing the ratchet when the starting member moves in a manner deviating from the usual movement.

5. The device according to claim 4, further provided with a safety lever, a double-arm lever, pivot means for said double-armed lever, said double-armed lever cooperating with said control lever and said safety lever, a base plate having an opening therein, a vertical, longitudinally displaceable shaft extending through said opening, said shaft being hingedly connected at its lower end with said double-armed lever, and with said safety lever, said shaft provided with a smooth control edge and a pair of stops opposite said smooth control edge, a spring positioned to draw said shaft upwardly while simultaneously swiveling it towards the edge of the opening, which is opposite said smooth control edge.

6. The device according to claim 5, in which the shaft is thicker in the area of the lower stop, slightly thinner in the area of the upper stop and considerably thinner between the two stops than the opening of the base plate.

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