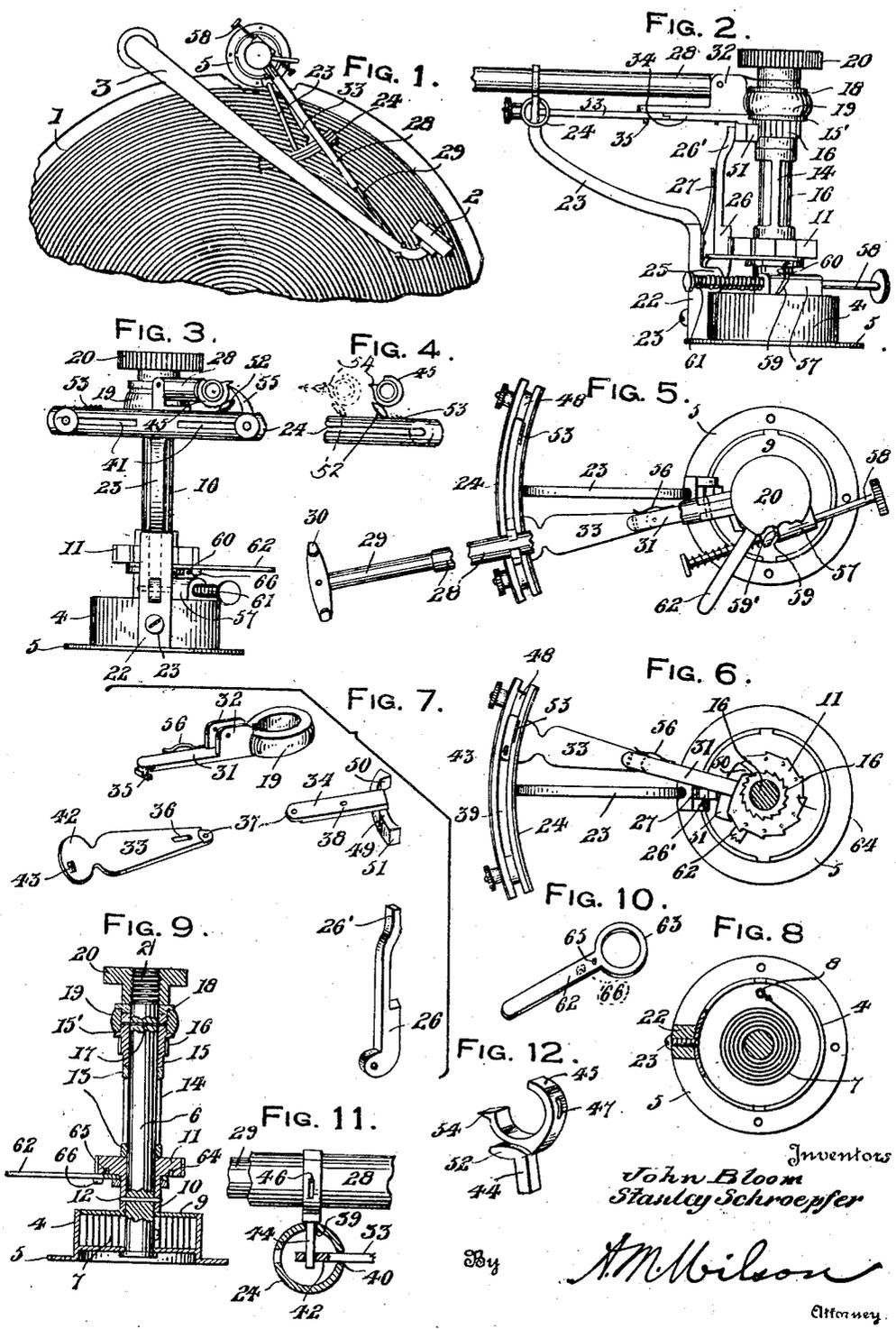


J. BLOOM AND S. SCHROEPFER,
 REPEATING ATTACHMENT FOR GRAMOPHONES.
 APPLICATION FILED DEC. 27, 1919.

1,358,613.

Patented Nov. 9, 1920.



Inventors
 John Bloom
 Stanley Schroepfer

A. M. Wilson
 Attorney.

UNITED STATES PATENT OFFICE.

JOHN BLOOM AND STANLEY SCHROEPPER, OF PITTSBURGH, PENNSYLVANIA.

REPEATING ATTACHMENT FOR GRAMOPHONES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, (1) JOHN BLOOM and (2) STANLEY SCHROEPPER, (1) a citizen of the United States of America and (2) a citizen of Poland, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Repeating Attachments for Gramophones, of which the following is a specification.

The present invention has particular reference to an attachment for the tone arm of a gramophone whereby the sound box and tone arm after having traversed the playing grooves of a record disk are restored to their initial starting positions.

A further object of the invention is to provide a device that is entirely automatic in operation for the restoration of a tone arm and sound box to its starting position for replaying a record disk, manually controlled means being connected with the device for varying the number of times the record disk is played.

With the above and other objects in view, the invention consists in the novel form, combination and arrangement of parts herein fully described and shown in the accompanying drawing, wherein like reference characters indicate similar parts throughout the several views.

In the drawing,

Figure 1 is a top plan view of the device operatively connected to a gramophone tone arm, a portion of a record disk being illustrated,

Fig. 2 is a side elevational view of the device with the shifter arm broken away,

Fig. 3 is a front elevational view showing the shifter arm at its initial starting position,

Fig. 4 is a fragmentary detail rear view showing the shifter arm elevated at the limit of its movement in one direction,

Fig. 5 is a top plan view of the device, partially broken away showing the shifter arm at its starting position,

Fig. 6 is a horizontal sectional view showing the mechanism for returning the shifter arm to starting position in locked engagement with the power shaft,

Fig. 7 includes detail perspective views

of the operating levers for the shifter arm,

Fig. 8 is a horizontal sectional view showing the band spring within the casing for tensioning the power shaft,

Fig. 9 is a vertical sectional view showing the adjustable stop lever journaled on the power shaft.

Fig. 10 is a perspective view of the stop lever removed from the shaft,

Fig. 11 is a fragmentary sectional view of a portion of the device showing the shifter arm supported above the bracket head, and

Fig. 12 is a detailed perspective view of the supporting band for the shifter arm.

There is illustrated in Fig. 1 a record disk 1 having the sound box 2 carried by the tone arm 3 operatively positioned above the disk with the present invention designed for restoring the tone arm to its initial starting position operatively connected thereto.

The present invention embodies a casing 4 having a lower mounting flange 5 by which the same may be secured to the box frame of a gramophone and has vertically journaled therein, the lower end of a post 6 surrounded by a coil spring 7 within the casing, with one end of the spring connected to said post while the other end of the spring is anchored within the casing as at 8, as shown in Fig. 8.

As shown in Fig. 9, the open upper end of the casing 4 is provided with a cover 9, which cover forms a bearing for the lower end of the sleeve 10 depending from the ratchet wheel 11 that is received on the post 6 and keyed thereto by the pin 12, the ratchet wheel 11 and sleeve 10 being rotatable with the post 6 under the influence of the spring 7. A spacing member shown more clearly in Figs. 2 and 9 embodies a pair of rings 13 connected by rods 14, the rings 13 being rotatably received on the post 6 between the ratchet wheel 11 and ring 15 having ratchet teeth 16 formed upon the periphery thereof intermediate the upper and lower ends, while said ring is secured to the post 6 to move therewith by the pin 17. A peripheral flange 15' is carried by the ring 15 and cooperates with the washer 18 in maintaining the collar 19 rotatable on

the post 6 and ring 15 as clearly shown in Fig. 9. A thumb nut 20 is screwed upon the upper threaded end 21 of the post 6 for maintaining the washer 18 in position thereon and also for placing the post 6 under tension in a manner to be presently described.

A bracket for supporting the tone arm shifter embodies a vertical base portion 22 secured as at 23 to the lower edge of the spring casing 4, the upper end of the vertical portion 22 being upwardly and outwardly inclined as at 23 and provided upon the outer free end thereof with a bracket head 24 of curved formation as shown in Figs. 5 and 6. The base portion 22 of the bracket is provided with a pair of ears 25 between which the pawl 26 is pivoted, the pawl being moved in a direction toward the ratchet wheel 11 and into working engagement therewith by the spring 27 carried by the bracket and engaging said pawl. It will therefore be seen that when the post 6 is rotated by the operating nut 20 to place the post under tension of the spring 7, said post is maintained in its wound position by the pawl 26 engaging the peripheral teeth of the ratchet wheel 11.

The arm for shifting the tone arm 3 of the gramophone comprises an inner tubular section 28 and an outer section 29 telescoping within the tube and carrying at its outer end, a resilient clamp 30 for engagement with the tone arm 3 at a point adjacent the sound box 2. As shown in Figs. 2 and 3, the collar 19 rotatable on the ring 15 between the flange 15' and washer 18 is provided with a projecting arm 31 carrying spaced ears 32 between which the inner end of the tubular section 28 is pivotally mounted. The arm 31 of the collar 19 is connected to the levers 33 and 34, which levers are movable with the arm and collar, the connection embodying a T-shaped pin 35 depending from the outer end of the collar arm 31 and being received in the slot 36 provided adjacent the inner end of the lever 33. The adjacent ends of the levers 33 and 34 are pivotally connected as at 37 while the lever 34 is further pivoted as at 38 to the under side of the collar arm 31. It will therefore be understood that pivotal movement of the lever 33 upon the collar arm 31 will cause a translating movement of the pivotal connection 37 between the levers 33 and 34, and while the lever 34 is pivoted as at 38 to the collar arm 31, such translating movement of the pivotal point 37 is compensated by the slot 36.

The bracket head 24 is of tubular construction and has a continuous slot 39 formed in the upper side thereof with a relatively long slot 40 formed upon the inner face thereof and terminating adjacent each end while the outer face of the bracket end 24 is provided with spaced slots 41 as shown

in Fig. 3. The outer free end 42 of the lever 33 freely slides through the inner slot 40 of the bracket head as shown in Figs. 2, 6, and 11 and is provided with an opening 43 into which is received the depending pin 44 of the band 45 for supporting the shifter arm section 28 as shown in Figs. 2 and 5, the pin 44 projecting downwardly through the upper slot 39 in the bracket head while the lower side of the band 45 carrying the pin rides upon the upper face of the bracket head. As shown in Figs. 11 and 12, the section 28 of the tone arm shifter carries a pin 46 working in the slot 47 in the band 45 for limiting the rotary movements of the band upon the arm section 28.

With the construction of device above described and assuming that the post 6 is placed under tension of the spring 7 by rotating the nut 20, the pawl 26 engaging the ratchet wheel 11 fixed to the post will maintain the post in its wound position. The collar 19 is freely rotatable upon the ring 15 and has fixed to the ears 32 carried thereby, the shifter arm sections 28 and 29, movement of the tone arm 3 over the record disk 1 carrying therewith the tone arm shifter and during such movement when the sound box 2 moves toward the axis of the disk 1, the outer telescopic section 29 of the shifter arm will move outwardly of the inner tubular section 28. During this movement, the collar arm 31 and the levers 33 and 34 will move over the bracket head 24 until the outer end 42 of the lever 33 contacts the adjustable stop 48, at which time continued movement of the tone arm shifter and collar arm 31 will cause a pivotal movement between the levers 33 and 34. Such continued movement will cause the lever 34 to move upon its pivotal connection 38 with the lever arm 31 to cause the cross head 49 carried thereby to project the pawl 50 into operative engagement with the ratchet teeth 16 upon the ring 15, thus to lock the collar 19 and collar arm 31, to the ring 15 and post 6. At this time, the band 45 upon the tone arm shifter section 28 will have moved over the bracket head 24 to present the lateral lug 52 carried thereby for engagement with the ratchet teeth 53. The pivotal movement of the lever 33 upon the pin 35 of the arm 31 will cause a swinging movement of the head 42 carried by the outer end of the lever 33 and with the pin 44 of the band 45 projecting into the opening 43 of the lever head 42, a slight counterclockwise movement of the band 45 upon the tone arm shifter will be accomplished and limited by the pin and slot connection 46 and 47 between the tone arm shifter section 28 and the band 45 thereby freeing the lug 52 from engagement with the slip faces of the ratchet teeth 53 and presenting the side of the band 45 adjacent the lug 52 for riding engagement

upon the upper face of the teeth 53, the lug moving over the slip faces of the ratchet teeth. At the extreme limit of movement of the tone arm shifter toward the center of the disk, the lug 52 has one edge thereof engaging the operating faces of the ratchet teeth 53. In this position, the collar 19 is locked to the shaft 6, so that the initial movement of the tone arm shifter at the end of the playing grooves of a record will be to shift the band 45 upon the tone arm shifter section 28 with the lug 52 constituting a temporary stationary pivot, thereby elevating the tone arm 3 and sound box 2 from the record disk 1 in an upward arcuate direction, with said parts supported in an elevated position upon the lug 52 resting on the teeth 53, the rotary movement of the band 45 being limited by the pin and slot connection 46 and 47 between the band and tone arm shifter section 28. The power of the spring 7 on the shaft 6 will be sufficient to rotate the shaft 6 to break the connection between the band lug 52 and the working faces of the ratchet teeth 53 after the band has moved its limit in a rotary direction, whereupon the lug 52 is presented for riding upon the upper face of the bracket arm 24, with the parts elevated as above described. Simultaneously with this movement, the opposite cam end 51 of the lever cross head 49 engages the upper projecting end 26' of the pawl 26 to move the pawl 26 out of engagement with the ratchet wheel 11, the pawl 26 being free of the ratchet wheel 11, and the collar 19 being locked to the post 6, the spring 7 will reversely rotate the post and carry therewith the collar and collar arm together with the levers and tone arm shifter connected thereto, as well as the tone arm 3 connected to the outer end of the shifter section 29.

The lug projection 54 is engaged by the prong 55 that is adjustable in the end slot 41 for moving the band 45 rotatably upon the shifter section 28 to disengage the lug 52 from the upper face of the bracket head 24 with a subsequent lowering of the shifter arm and sound box 2 upon the record 1. As shown in Figs. 5, 6, and 7, a spring 56 carried by the collar arm 31 has the free end thereof engaging the lever 34 adjacent its pivotal connection 37 to insure the spacing of the cross head pawl 50 with respect to the ratchet teeth 16 upon the ring 15. It will therefore be seen that when the pawl extension 26' is engaged by the cam 51 of the lever cross head 49 at the limit of the movement of the tone arm shifter in one direction, the pawl 26 is disengaged from the ratchet wheel 11 to permit the ratchet wheel and post to reversely rotate and carry therewith the tone arm shifter and tone arm that become locked to the post 6 by the pawl 50 upon the lever cross head 49 engaging the

ratchet teeth 16 upon the ring 15 which in turn is fixed to the tensioned posts 6. Also, it will be understood that when the band 45 for supporting the tone arm shifter reaches the limit of its movement in one direction that the lug 52 carried thereby will engage the ratchet teeth 53 upon the bracket head 24 and upon a reverse rotation of the post 6, the lug 52 will cooperate with the ratchet teeth 52 to shift the band 45 to elevate the same whereby the lug rides upon the upper face of the bracket head 24 and with the shifter arms 28 and 29 elevated together with the tone arm 3 and sound box 2. The prong 55 being adjustable in the bracket head slot 41, the engagement of the prong with the band lug 54 may be timed to engage the lug at the desired point of movement over the bracket head to shift the band upon the shifter arm 28 with a subsequent lowering of the shifter arm and sound box upon the record disk at its initial starting position. During each reverse movement of the post 6, one ratchet tooth upon the wheel 11 escapes the pawl 26 while the spring 56 carried by the lever arm 31 clearly shown in Figs. 5 to 7, engages the inner end of the lever arm 33 to shift the pivotally connected levers 33 and 34 whereby the lug 50 is disengaged from the ratchet teeth 16 and the band 45 rotated on the tone arm shifter by the pin connection 44 with the arm head 42, the prong 55 engaging the lug projection 54 and cooperating with the movement of the lever arm 33 to rotate the band 45 upon the tone arm shifter, thereby displacing the lug 52 from engagement with the bracket head 24, this movement being accomplished when the sound box 2 is at the starting position on the record disk 1.

A stop and control device for regulating the number of times for repeating a record disk includes a barrel 57 fixed to the cover 9 of the casing 4 and having a rod 58 longitudinally slidably positioned therein with a head upon each end thereof. The barrel 57 has an inclined slot 59 arranged in the side wall thereof while the upper wall is provided with a communicating transverse slot section 59' through which the pin 60 having an angularly bent head as shown in Fig. 2 is adapted to project, the pin being carried by the rod 58. The coil spring 61 surrounds the rod 58 between the head at one end thereof and the adjacent end of the barrel 57 for placing the rod under tension. As shown in Figs. 6, 9, and 10, a stop lever 62 carries a ring 63 that is received on the depending sleeve 10 of the ratchet wheel 11 and is maintained in position thereon by a collar. The lower face of the ratchet wheel 11 is provided with a circular series of openings 64 into which the pin 65 carried by the stop lever is adapted to be selectively received while a depending lug 66 is carried by the

stop lever 52 for engagement with the pin 60 upon the stop rod 58. The stop lever 62 being formed of resilient material, the same may be moved downwardly at its outer end to cause the pin 65 to be received in the desired adjacent ratchet wheel opening 64 and when the post 6 is reversely rotated the lever 62 will rotate therewith and the depending lug 66 will engage the upper bent end of the pin 60 to move the same through the transverse portion 59' of the barrel slot and into the inclined portion 59 whereupon the spring 61 will shift the rod 58 to move the same into contact with the peripheral edge of the record disk 1 for purposes of stopping the rotation thereof. With this arrangement of stop device, the restoring mechanism may be set to play the record disk one or more times under the control of the operator.

While there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be understood that minor changes may be made in the form, combination and arrangement of parts without departing from the spirit and scope of the same as hereinafter claimed.

What is claimed as new is:

1. A device for shifting a gramophone tone arm comprising a tensioned rotatable post, operative connections between said post and tone arm, said operative connections including an operating arm, elevating means therefor and means for carrying said arm loosely supported on said post and adapted to be locked thereto for movement with the post.

2. A device for shifting a gramophone tone arm comprising a tensioned rotatable post, operative connections between said post and tone arm, said operative connections including a ratchet member fixed to said tensioned post and a ring normally free on said post and adapted to be locked to said ratchet member for rotation therewith.

3. A device for shifting a gramophone tone arm comprising a tensioned rotatable post, operative connections between said post and tone arm, said operative connections including a telescoping arm fixed to said tone arm, a ring rotatable on said post and connected to the inner end of said telescopic arm, means for connecting the ring to said post and automatically releasable means to permit a reverse rotation of said post together with said ring and arm.

4. A device for shifting a gramophone tone arm comprising a tensioned rotatable post, operative connections between said post and tone arm adapted to cause the tone arm to be elevated and restored to starting position, means for stopping the gramophone, and operative connections between the post and stopping means.

5. A device for shifting a gramophone

tone arm comprising a tensioned post, a ring freely rotatable on said post, a tone arm shifter connected to said ring, and means made operative at the limit of movement of the tone arm shifter in one direction to lock the ring to the post and to render said post operative for reverse rotation.

6. A device for shifting a gramophone tone arm comprising a tensioned post, a ring freely rotatable thereon, a tone arm shifter connected to said ring, means for holding the tensioned post stationary and means made operative at the limit of movement of the tone arm shifter in one direction to lock the ring to the post and to release the aforesaid post holding means whereby the post and tone arm shifter are reversely rotated.

7. A device for shifting a gramophone tone arm comprising a tensioned post, a ring freely rotatable thereon, a tone arm shifter connected to said ring, means carried by said ring adapted to lock the ring to the post at the limit of rotation of the ring in one direction on the post and means for holding the post against rotation adapted to be operated by the means for locking the ring to the post whereby said ring and tone arm shifter are reversely rotated.

8. A device for shifting a gramophone tone arm comprising a tensioned post, a tone arm shifter rotatable thereon, means for locking the tone arm shifter to the post, means operated by the aforesaid means normally engaging said post and adapted to be disengaged therefrom to permit a reverse rotation of the post and means operated by a reverse rotation of the post for stopping the gramophone.

9. A device for shifting a gramophone tone arm comprising a tensioned post, a tone arm shifter rotatable thereon, means for locking the tone arm shifter to the post, means operated by the aforesaid means normally engaging said post and adapted to be disengaged therefrom to permit a reverse rotation of the post, a tensioned rod arranged adjacent the post and adapted to be operated upon a reverse rotation of the post to stop the gramophone.

10. A device for shifting a gramophone tone arm comprising a tensioned post, a tone arm shifter rotatable thereon, means for locking the tone arm shifter to the post, means operated by the aforesaid means normally engaging said post and adapted to be disengaged therefrom to permit a reverse rotation of the post, a tensioned stop rod arranged adjacent the post and means carried by the post adapted to engage the rod for shifting the same to engaging position with the disk for stopping the rotation of the same.

11. A device for shifting a gramophone tone arm comprising a tensioned post, a tone arm shifter rotatable thereon, means for

locking the tone arm shifter to the post, means operated by the aforesaid means normally engaging said post and adapted to be disengaged therefrom to permit a reverse
5 rotation of the post, a tensioned stop rod arranged adjacent the post and means adjustable on said post adapted to engage said

rod to shift the same to engaging position with the disk for stopping the rotation of the same.

In testimony whereof we affix our signatures.

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JOHN BLOOM,
STANLEY SCHROEPFER.