

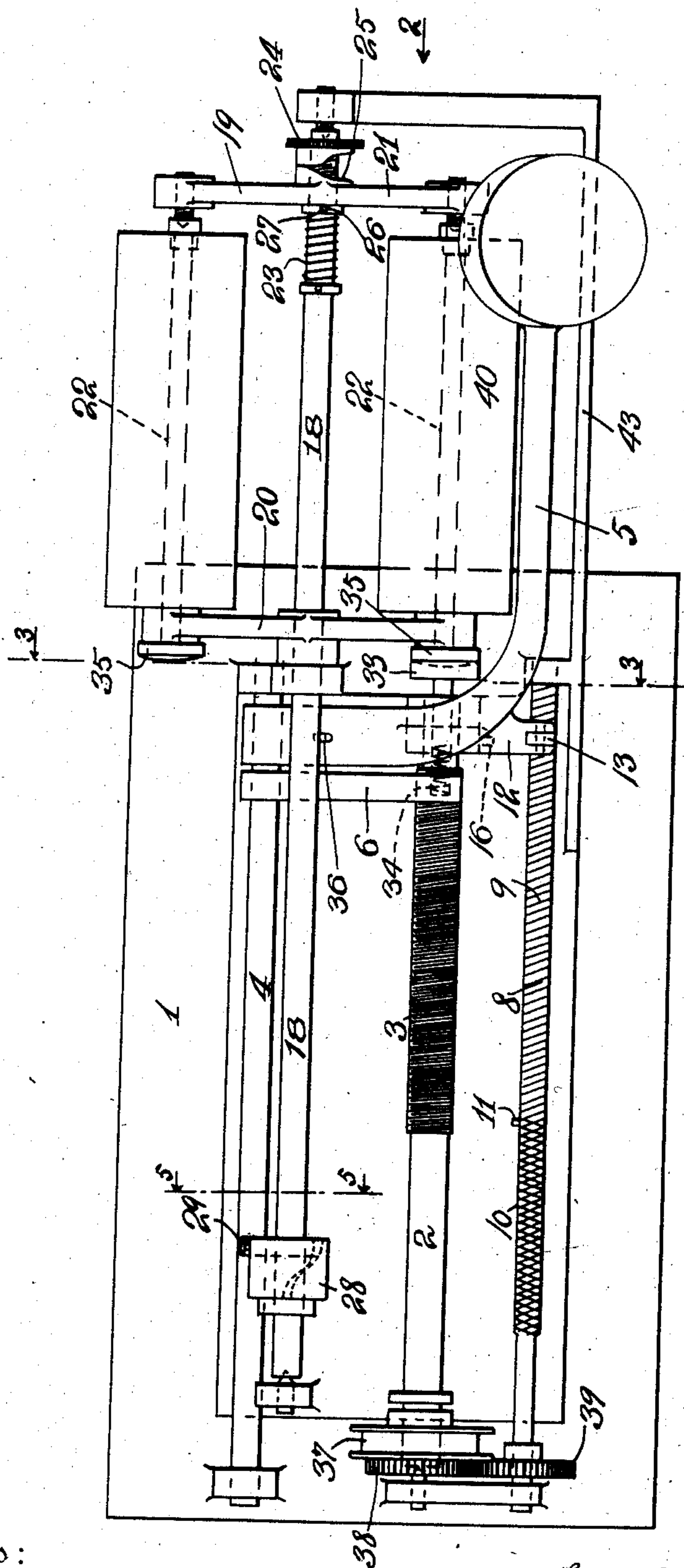
No. 873,969.

PATENTED DEC. 17, 1907.

C. THOMA, JR. & W. THOMA.
PHONOGRAPH.

APPLICATION FILED MAY 16, 1907.

2 SHEETS—SHEET 1.



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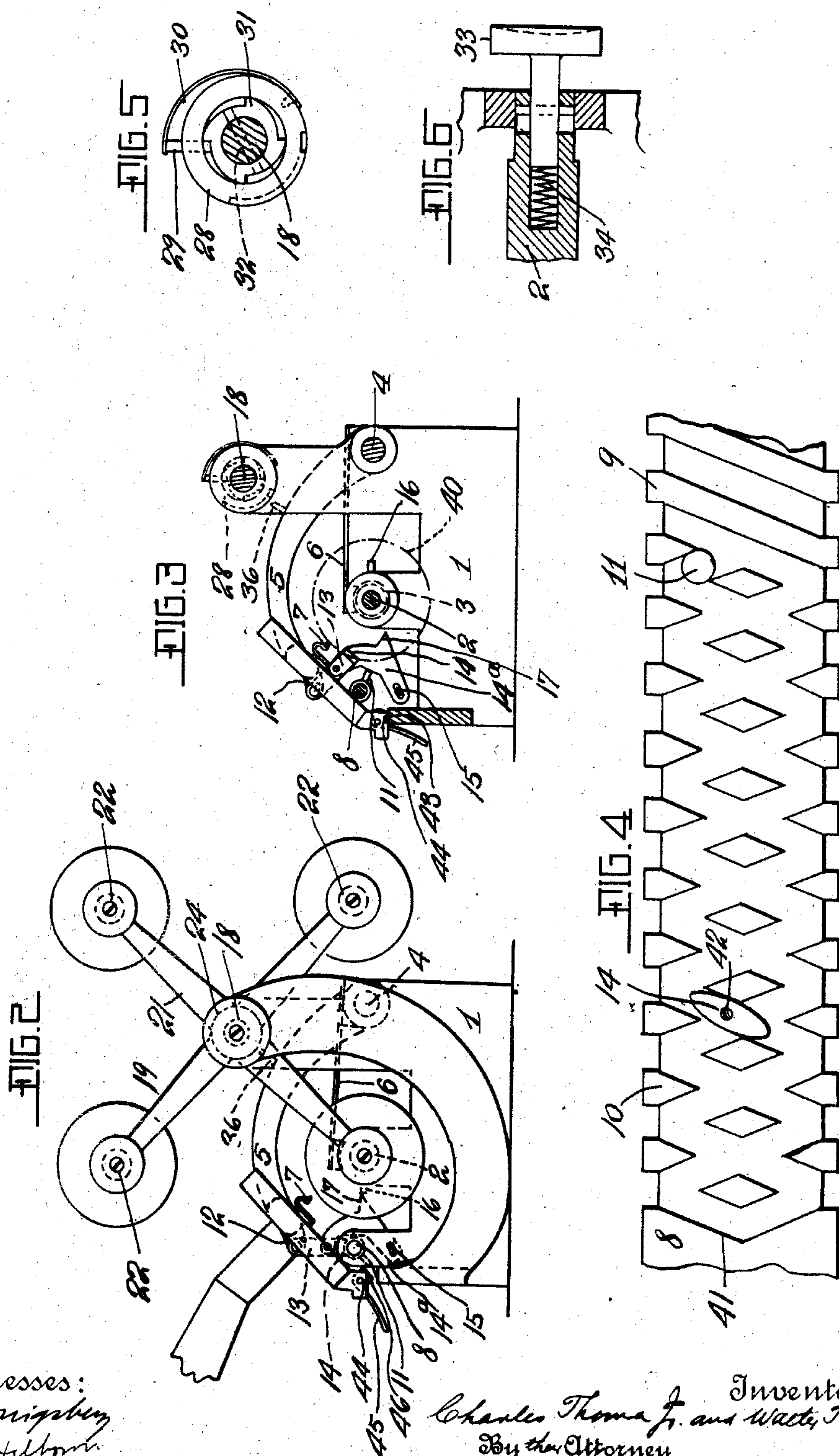
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2 SHEETS—SHEET 2.



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PHONOGRAPH.

No. 873,969.

Specification of Letters Patent.

Patented Dec. 17, 1907.

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To all whom it may concern:

Be it known that we, CHARLES THOMA, JR., and WALTER THOMA, citizens of the United States of America, and residents of Carlstadt, Bergen county, and State of New Jersey, have invented certain new and useful Improvements in Phonographs, of which the following is a specification.

The present invention relates to phonographs or other sound reproducing machines, and has more particularly reference to a multi-record or a repeater phonograph.

In machines of this character, the record, or the sound reproducing mechanism, is given a reciprocating motion, one with relation to the other. One motor being utilized to effect the forward feed or outward excursion during the sound reproducing period, and another motor, generally a spring or a weight, is utilized to return the parts to their original position at a greater speed than that attained during the outward excursion.

The chief object of the present invention is to produce a multi-record machine operating automatically, and the invention consists of the hereinafter described features of construction as pointed out in the claims.

In the accompanying drawings the invention is embodied in a concrete and preferred form, but changes of construction may be made without departing from the legitimate and intended scope of the invention.

In the said drawings:—Figure 1 is a plan view of a phonograph embodying the invention. Fig. 2 is an end elevation looking in the direction of the arrow 2 in Fig. 1, showing the stylus disengaged from the record. Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 1 showing the stylus in engagement with the record. Fig. 4 is a detail view of the double reversely threaded repeater screw. Fig. 5 is a vertical sectional view on the line 5—5 in Fig. 1. Fig. 6 is a sectional detail view of part of the feed screw.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates a frame work of any suitable construction for properly supporting the parts composing the machine.

2 indicates the main drive shaft carrying the feed screw 3. Pivotally supported on the shaft 4 and adapted to slide thereon is a sound reproducing mechanism 5 connected to the thread follower 6 adapted to engage

with the feed screw during the sound reproducing period and having the stylus 7 adapted to engage with the record.

8 indicates the repeater screw whose threads are coarser than those of the feed screw. This repeater screw is provided with one thread 9 extending substantially throughout its entire length and with a reverse thread 10 extending only a short distance of its length and provided with a trip 11. Mounted on the bracket 12 of the sound reproducing mechanism is a link 13 provided with the boat-shaped thread follower 14 adapted to engage in the threads of the double reverse threaded repeater screw 8. Pivotally connected to the link 13 is an arm 14^a which has another pivotal support on the rod 15 located underneath the repeater screw and on which the said arm is adapted to slide. Mounted on the drive shaft 2 is a trip 16 which is adapted to engage with the nose 17 of the arm 14^a when brought into the plane thereof.

18 denotes a shaft on which is mounted the record carrier 19. This record carrier is composed of two hub sections 20 and 21, one of which is fixed and is provided with a plurality of spindles 22 for supporting records. The other hub section 21 normally tends to be forced out of engagement with the spindles 22 by reason of the spring 23 but is confined and held in contact with the said spindles by reason of the cam nut 24 engaging with the cam surface 25 on the hub section. By turning the cam nut 24 the spring 23 will be allowed to press the hub section 21 out of engagement with the spindles 22, and by turning the arms of the said hub section to a point where they will be in between the records, the latter can be removed from the spindles and replaced by others.

26 indicates a slot in the hub section 21 adapted to receive the pin 27 on the shaft 18 so as to insure the hub section 21 being returned to its proper position circumferentially when it is tightened up against the spindles 22. Loosely mounted on the shaft 18 is a cam collar 28 having the pawl 29 held in position by the spring 30 and adapted to engage with the teeth of the ratchet 31 when turned in one direction and to move idly over the teeth when turned in the other direction. The ratchet 31 is fixed on the shaft 18 by means of the pin 32.

36 is a pin carried by the sound reproducing

ing mechanism adapted to engage with the cam collar 28.

On the end of the drive shaft 2 is a friction disk 33 held yieldingly in position by means of a spring 34. One end of each of the spindles 22 is provided with a complementary friction disk 35 adapted to engage with the feed screw 33 when brought into alinement therewith, the spring 34 allowing the two disks to slip into engagement with each other.

Motion is imparted to the device by means of a suitable motor from which power is transmitted to the pulley 37 on the drive shaft 2, and for the purpose of this disclosure the said pulley 37 may be considered the motor. 38 indicates a gear mounted on the end of the shaft 2 and intermeshing with the gear 39 on the end of the repeater screw.

The operation is as follows:—Assume that the sound reproducing mechanism is traveling in a forward direction during the sound reproducing period and that the thread follower is in engagement with the feed screw 3 and the stylus 7 in engagement with the record 40. As the sound reproducing mechanism reaches the limit of its movement in a forward direction the nose 17 on the arm 14^a will be brought into the plane of the trip 16 on the feed screw shaft. This will cause the link 13 to be swung around its pivot on the sound reproducing mechanism whereby the boat shaped follower 14 will be brought into engagement with the thread 9 of the repeater screw, at the same time causing the said reproducing mechanism to be turned on the shaft 4 and lifting the thread follower 6 out of engagement with the feed screw 3 and the stylus 7 out of engagement with the record. By this means the sound reproducing mechanism will be moved back to its initial position, but at a greater speed than the speed of its outward excursion. When the follower 14 reaches the extreme end of the thread 9 it will come into contact with the surface 41 causing the said follower to be turned around its swivel point 42 and to engage in the thread 10 of the repeater screw. By this means the motion is reversed and the sound reproducing mechanism is moved forward again but at a greater speed than the speed attained during the sound reproducing period. This forward motion will continue until the follower 14 encounters the trip 11 which will cause the link 13 to swing around its pivot on the sound reproducing mechanism thereby disengaging the follower from the shaft 8 and allowing the said reproducing mechanism to descend and the thread follower 6 to be brought into contact with the feed screw 3 and the stylus into engagement with the record. In this way the same record may be repeated several times. If, however, the pin 36 is in position on the sound reproducing mechanism it will during the re-

turn movement of the said sound reproducing mechanism, enter the groove of the cam collar 28, thereby causing the pawl 29 to engage with the ratchet 31 and thus turn the shaft 18 automatically a sufficient distance to bring another record into engagement with the end of the shaft 2. The forward movement of the sound reproducing mechanism will cause the pin 36 to travel in the cam groove of the collar 28 thereby turning it back again so as to reposition it for the next return movement, without however, turning the shaft 18.

43 denotes a guideway on the framework adapted to support the projection 44 of the sound reproducing mechanism when the stylus is in engagement with the record, so as to relieve the latter of the weight of the said reproducing mechanism.

45 is a lever having the cam surface 46 whereby the stylus can be raised out of engagement with the record at will.

What is claimed is:—

1. In a phonograph, the combination of a record, a sound reproducing mechanism, and driving means for causing one of the said members to be reciprocated with relation to the other, comprising: a feed screw, a thread follower adapted to engage with the feed screw during the sound reproducing period, a double reversely threaded repeater screw, a second thread follower adapted to engage with the repeater screw, means for causing the first thread follower to disengage with the feed screw at the end of the sound reproducing period and the second thread follower to engage with one of the threads of the repeater screw thereby returning the parts to their original position, means for causing the second thread follower to engage with the other thread of the repeater screw at the end of the return movement so as to advance the parts prior to the sound reproducing period, and means for causing the second thread follower to disengage with the repeater screw and the first thread follower to engage with the feed screw at the beginning of the sound reproducing period.

2. In a phonograph, the combination of a record, a transversely movable sound reproducing mechanism, a feed screw, a thread follower, carried by the sound reproducing mechanism, a feed screw, a thread follower, carried by the sound reproducing mechanism, adapted to engage with the feed screw during the sound reproducing period a double reversely threaded repeater screw, a second thread follower, carried by the sound reproducing mechanism, adapted to engage with the repeater screw, means for causing the first thread follower to disengage with the feed screw at the end of the sound reproducing period and the second thread follower to engage with one of the threads of the repeater screw thereby returning the sound

reproducing mechanism to its original position, means for causing the second thread follower to engage with the other thread of the repeater screw at the end of the return movement so as to advance the sound reproducing mechanism prior to the sound reproducing period, and means for causing the second thread follower to disengage with the repeater screw and the first thread follower to engage with the feed screw at the beginning of the sound reproducing period.

3. In a phonograph, the combination of a record, a sound reproducing mechanism, and driving means for causing one of the said members to reciprocate with relation to the other, comprising: a feed screw, a thread follower adapted to engage with the feed screw during the sound reproducing period, a double reversely threaded repeater screw whose threads are coarser than the threads of the feed screw, a second thread follower adapted to engage with the repeater screw, means for causing the first thread follower to disengage with the feed screw at the end of the sound reproducing period and the second thread follower to engage with one of the threads of the repeater screw thereby returning the parts to their original position at a greater speed than their speed during the sound reproducing period, means for causing the second thread follower to engage with the other thread of the repeater screw at the end of the return movement so as to advance the parts prior to the sound reproducing period at a speed greater than their speed during the sound reproducing period, and means for causing the second thread follower to disengage with the repeater screw and the first thread follower to engage with the feed screw at the beginning of the sound reproducing period.

4. In a phonograph, the combination of a record, a transversely movable sound reproducing mechanism, a feed screw, a thread follower carried by the sound reproducing mechanism, adapted to engage with the feed screw during the sound reproducing period, a double reversely threaded repeater screw whose threads are coarser than the threads of the feed screw, a second thread follower, carried by the sound reproducing mechanism, adapted to engage with the repeater screw, means for causing the first thread follower to disengage with the feed screw at the end of the sound reproducing period and the second thread follower to engage with one of the threads of the repeater screw thereby returning the sound reproducing mechanism to its original position at a greater speed than its speed during the sound reproducing period, means for causing the thread follower to engage with the other thread of the repeater screw at the end of the return movement so as to advance the sound reproducing mechanism at a speed greater

than its speed during the sound reproducing period, and means for causing the second thread follower to disengage with the repeater screw and the first thread follower to engage with the feed screw at the beginning of the sound reproducing period.

5. In a phonograph, the combination of a record, a transversely movable sound reproducing mechanism pivotally supported, a feed screw, a repeater screw, a stylus, and a thread follower for the feed screw, both carried by the sound reproducing mechanism and responding to the pivotal motion thereof, a second thread follower pivotally supported on the sound reproducing mechanism and adapted to engage with the repeater screw, means for turning the second thread follower around its pivot in one direction so as to cause it to engage with the repeater screw thereby lifting the sound reproducing mechanism around its pivotal support and raising the stylus out of engagement with the record and the first thread follower out of engagement with the feed screw, and means for turning the second thread follower around its pivot in the other direction so as to cause it to disengage with the repeater screw thereby allowing the sound reproducing mechanism to descend and the first thread follower to engage with the feed screw, and the stylus to engage with the record.

6. In a phonograph, the combination of a record, a transversely movable sound reproducing mechanism pivotally supported, a feed screw, a double reversely threaded repeater screw, a stylus, and a thread follower for the feed screw, both carried by the sound reproducing mechanism and responding to the pivotal motion thereof, a second thread follower pivotally supported on the sound reproducing mechanism and adapted to engage with the repeater screw, means for turning the second thread follower around its pivot in one direction so as to cause it to engage with one thread of the repeater screw thereby lifting the sound reproducing mechanism around its pivotal support and raising the stylus out of engagement with the record and the first thread follower out of engagement with the feed screw, means for causing the second thread follower to engage with the other thread of the repeater screw thereby reversing the motion of the sound reproducing mechanism, and means for turning the second thread follower around its pivot in the other direction so as to cause it to disengage with the repeater screw thereby allowing the sound reproducing mechanism to descend and the first thread follower to engage with the feed screw, and the stylus to engage with the record.

7. In a phonograph, the combination of a shaft, a record carrier mounted thereon adapted to support a plurality of records, a sound reproducing mechanism, means for re-

5 ciproccating the sound reproducing mechanism, a cam having a ratchet and pawl connection with the said shaft, and means carried by the sound reproducing mechanism for engaging with the said cam to rotate the shaft during the return stroke of the sound reproducing mechanism.

10 8. In a phonograph, a record carrier comprising: a shaft, a fixed hub section, a plurality of spindles for supporting records, fixed on the hub section, a second hub section adapted to engage with the free end of the fixed spindles, a spring for pressing the said second hub section away from the spindles, 15 means for confining the said second hub section against the spindles, which when released allows the said spring to move the second hub section out of engagement with the

spindles, whereby the said second hub section can be turned out of the plane of the 20 records so that the latter can be removed from the spindles.

9. In a phonograph, the combination of a sound reproducing mechanism, a double reversely-threaded screw, and a thread follower 25 connected to the sound reproducing mechanism and adapted to engage with the threads of the screw to move the sound reproducing mechanism in both directions.

Signed at New York city this 7th day of 30 May 1907.

CHARLES THOMA, Jr.
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