

H. B. McNULTY.
PHONOGRAPH.

APPLICATION FILED MAY 24, 1909.

1,020,151.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.

Fig. 1

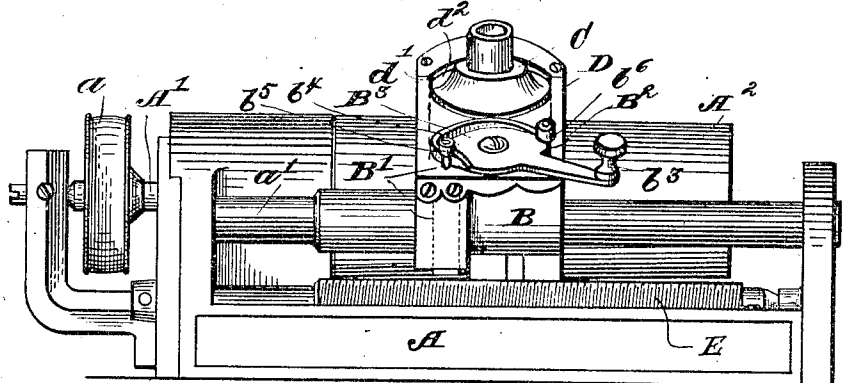


Fig. 5

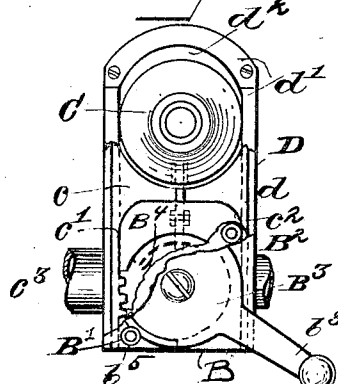


Fig. 2

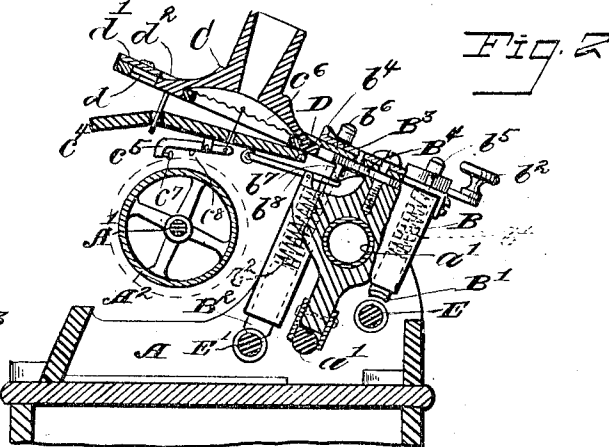


Fig. 3

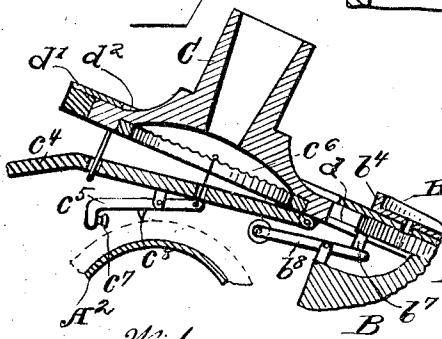
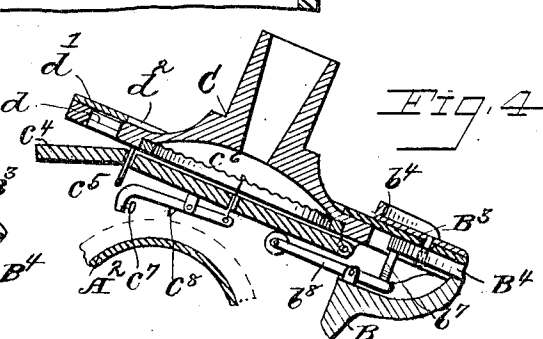


Fig. 4



Witnesses:
Robert M. See
Jno. F. O'Brien

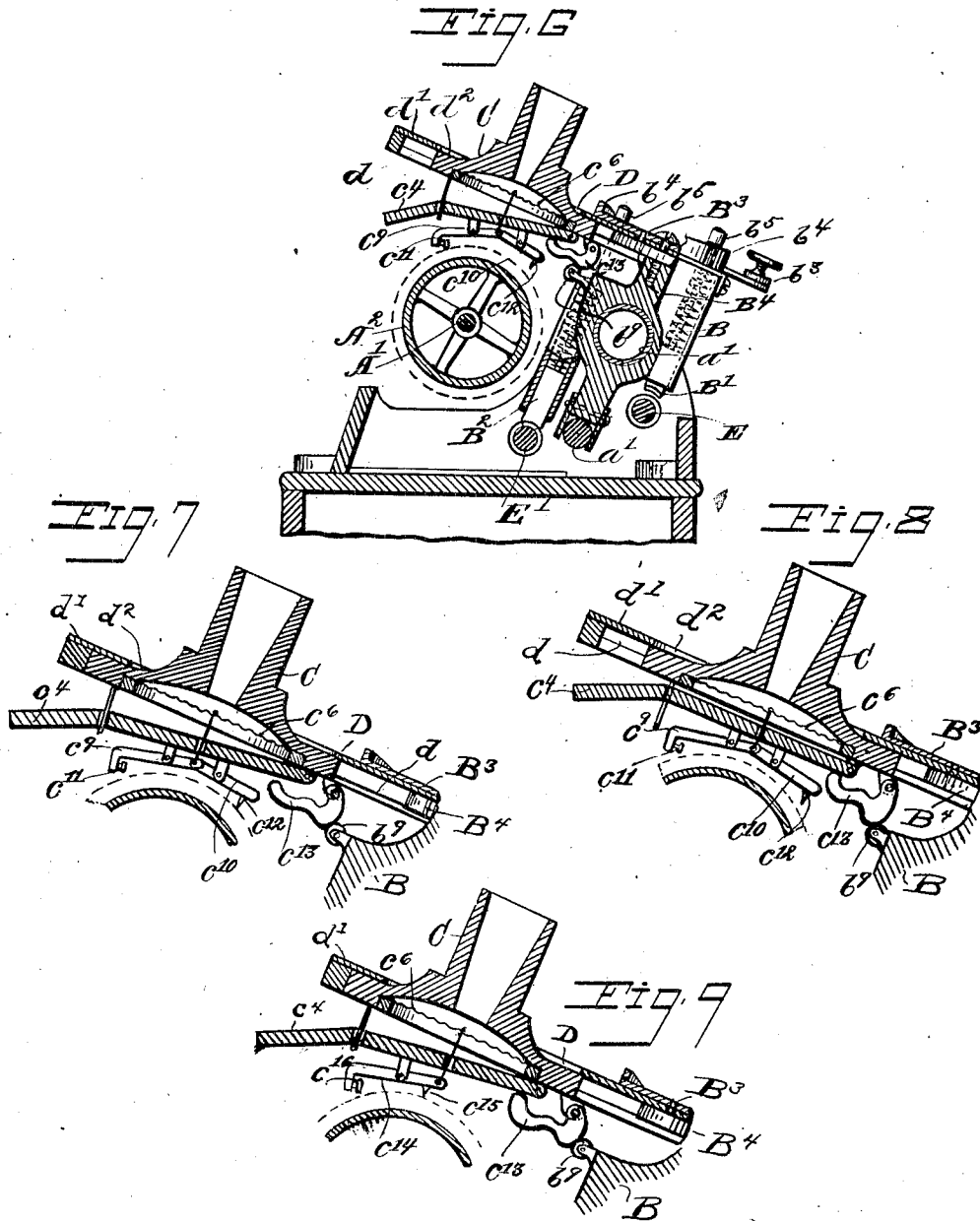
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Harry B. McNulty
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2 SHEETS—SHEET 2.



Witnesses:
 Robert M. See
 Jno. T. Obelin

Witness:
 Harry D. McNulty
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UNITED STATES PATENT OFFICE.

HARRY B. McNULTY, OF EAST CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES PHONOGRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PHONOGRAPH.

1,020,151.

Specification of Letters Patent.

Patented Mar. 12, 1912.

Application filed May 24, 1909. Serial No. 498,040.

To all whom it may concern:

Be it known that I, HARRY B. McNULTY, a citizen of the United States, and a resident of East Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Phonographs; of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The object of the invention is the provision of a phonograph that will be adapted to operate, as desired upon records having threads of different fineness, as for instance, upon records having 100 and 200 threads to the inch, or as they are commonly known "two minute" and "four minute" records. Such adaptation involves a change in the rate of the movement of the sound-box along the record to correspond with such thread-fineness, and a corresponding shifting of the stylus, since a stylus suitable for playing or cutting one thread, as for example, the finer thread, will not work satisfactorily in the case of the coarser thread, and vice versa. The present invention is designed to supply simple and conveniently operable means for correlating and simultaneously effecting these two adjustments, said means together with other accessory features being hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail, certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a front elevation of a phonograph embodying my several improvements; Fig. 2 is a transverse sectional view thereof with parts appearing in elevation; Fig. 3 is a similar transverse sectional view of a part only of the device, the sound-box and adjacent parts alone appearing and being shown in a different operative position from that of Fig. 2; Fig. 4 is a view similar to Fig. 3, but showing the parts in question in yet another operative position; Fig. 5 is a plan view of the sound-box carriage with parts broken away to show certain operating details; Fig.

6 is a transverse sectional view of a phonograph corresponding to that of Fig. 2, but showing certain modifications in construction; Figs. 7 and 8 are similar sectional views, showing the sound-box and adjacent parts only, such latter appearing in different operative positions from that of Fig. 6; and Fig. 9 illustrates, by a corresponding section, the adaptation of my invention to a slightly different type of sound-box.

Referring first of all to Figs. 1 and 2, A will be seen to indicate the base of the phonograph, it not being intended to designate the driving mechanism, whether a spring or other motor, as a part of the phonograph. The main shaft A' of the phonograph, accordingly, upon which record-receiving mandrel A² is mounted, is provided with a driving pulley a, by means of which connection between such motor, whatever its character, and the phonograph, may be had. It will be understood that the motor is suitably governed to drive such main shaft at a predetermined rate of speed. Parallel with shaft A' and mandrel A², are ways a' upon which is slidably mounted the carriage B that furnishes support for the sound-box C, which in illustrated form is designed for sound-reproduction purposes and so will hereinafter be referred to simply as a reproducer. Such sound-box, or reproducer, it will be understood requires to be fed along the record mounted upon the mandrel when the machine is in use.

The feeding mechanism for the carriage comprises two feed screws E, E' respectively having a thread corresponding with two desired rates of feed, when taken in conjunction with the gearing connection (not shown) that is provided for driving said screws from the main or mandrel shaft A' of the phonograph. As illustrated, such thread is designed to be the same on both screws, and the entire variation in rate is secured by rotating the one screw twice as rapidly as the other by suitably proportioning the connecting gears, just referred to, with this result in view. Reciprocally mounted in the carriage B are two plungers B' B², the lower ends of which are in the form of sectional nuts adapted to cooperate with such feed screws, respectively, springs b' b² being provided in connection with such plungers to normally retain the same in en-

gagement with the corresponding feed screws. Rotatably mounted upon the upper face of the carriage, is a disk B³ provided with an operating handle b³ and bearing on its upper face a cam b⁴ adapted to engage the upper ends b⁵ b⁶ of the plungers B⁷ B² respectively, and so disposed as to withdraw the same from engagement with the screws E E' in the intermediate position of the handle as illustrated in Fig. 2. However, first the one and then the other of said plungers is allowed to be lowered by its spring into such engagement, upon turning the aforesaid handle to the right or left of such intermediate position, as will be obvious. That portion of the carriage designed for the reception of the reproducer, instead of consisting of an annular holder in which the reproducer is designed to be snugly held, as in the prevailing construction, comprises an elongated way D, said way being disposed transversely of the mandrel upon which the record is mounted. The details of the construction of this way need not be further noted, than to remark that it comprises in effect two lateral guides d adapted to be covered, in the assembled machine, by a plate d' in which an elongated slot d² is provided through which the upper tubular part of the reproducer extends.

The flanged part or base c of the reproducer is modified in form to fit the guides d, and in addition is provided with forwardly projecting arms c' c² that lie on either side of the axis of the cam disk B³. Suitably held in the carriage frame, and secured to said cam disk, so as to be in effect a part of the same, is a broken gear B⁴ the teeth of which mesh with a series of rack-teeth c³ on the reproducer arm c'. Rotation of said cam plate will accordingly be effective, when said gear and rack are in engagement, to shift the reproducer transversely of the mandrel A² and of a record mounted thereon. The second reproducer arm c² merely bears against the smooth side of the gear B⁴, so as to steady this movement and prevent the reproducer from binding in the guide ways that slidably support the same. I further provide on the under face of such gear member, a raised edge b⁷ constituting a cam which engages with the rear end of a lever b⁸, so as to rock the same, as said gear member B³ is rotated. The conformation of such cam b⁷ is such as to oscillate the lever to immediately raise the floating weight c⁴ of the reproducer C upon actuation of the gear member from either of its extreme positions, (in which connection is had with one or the other of the feed screws), and before any operative engagement takes place between the gear and rack teeth. Engagement between these last named parts, however, does take place at an intermediate position of the gear member, but ceases before

cam b⁷ permits the weight of the reproducer to be again lowered into operative position. It will thus be seen that the floating weight c⁴ and thereby the stylus lever c⁵ of the reproducer are raised into inoperative position whenever the reproducer is shifted. This stylus lever, while attached to the weight c⁴ and connected with the diaphragm c⁶ of the reproducer in the prevailing fashion, is distinguished from such prevailing construction by bearing two styluses c⁷ c⁸ instead of one. Of these styluses, the one is adapted, in the manner previously indicated, for operation on records having one fineness of thread, while the other is similarly adapted for operation of another type of record. Said styluses furthermore, are so disposed on the lever that the shifting movement just referred to as being secured by rotation of the cam plate B³ and attached gear member B⁴ brings first the one and then the other stylus into contact with the record mounted upon the phonograph mandrel. Accordingly a single operation of the handle b³ it will be seen, serves to control connection of the carriage with the feed screws, and simultaneously to prepare the reproducer for operation on a record corresponding with the particular feed screw that may be operatively connected with the carriage.

The modification in construction illustrated in Figs. 6, 7 and 8 consists first of all in the use of two stylus levers c⁹ c¹⁰ extending in opposite radial directions from the center of the reproducer, but each connected with the floating weight c⁴ and otherwise figuring as the single stylus lever of the prevailing type of phonograph. The styluses c¹¹ c¹² of said levers, however, are respectively formed for use in connection with different types of records as in the case of the two styluses c⁷ c⁸ borne by the single lever c⁵ in the first described construction. A further change introduced in this construction, is the substitution for the lever b⁸ operated by the raised cam edge b⁷ of gear member B⁴, of a dog c¹³ borne by the under side of the plate c forming the slidable base of the reproducer, which dog is brought into engagement with a roller b⁹ as said reproducer is now advanced, now retracted. Since roller b⁹ is mounted on a fixed axis the effect of this engagement, as will be evident from an inspection of the figures of reference, will be substantially the same as that of the lever previously described; namely, the floating weight of the reproducer will be raised immediately upon movement of the reproducer from either of its extreme positions, and such weight will be held in raised position until the other normal operative position is reached. The general operation of the device aside from this, however, remains the same, the control of the rate of feed being obviously correlated, as before, with the ad-

justment of the reproducer to play on one kind of record or the other, as occasion may demand.

In Fig. 9 I have shown yet another construction of stylus lever, whereby two styluses, c^{14} , c^{15} , respectively adapted for operation on diverse kinds of records as heretofore described, are supported from one stylus lever c^{16} in such position that shifting of the reproducer transversely of the record will bring first one and then the other of such styluses into operation with the latter. No detail description of the operation of this modification is deemed necessary, as this fully appears from an inspection of the figure.

Obviously, the various modifications in construction illustrated in the several figures of the drawings may be variously combined, as there is no necessary insistence on the particular association of such constructional forms that happens to be shown in any one of such figures.

It is not intended, moreover, by referring to the specific use of the improvements under consideration in adapting a phonograph to operation on records of the specific kind described, to imply any limitation to the use of the invention to the accomplishment of this object, since various features embodied herein are susceptible of more general application.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the class described, the combination of a record support; a movably mounted sound-box provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted variously to feed said record support and sound-box relatively to each other; and controlling means for said feed means adapted likewise to shift said reproducer to operatively position the desired stylus.

2. In mechanism of the class described, the combination of a record support; a slideway; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said record-support and slideway relatively to each other at different rates of speed; and controlling means for said feed means adapted likewise to shift said sound-box in said slide-way to operatively position the desired stylus.

3. In mechanism of the class described, the combination of a mandrel for the record and a member relatively movable in a direction longitudinal of said mandrel, said member including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said mandrel and member relatively to each other at different rates of speed; and controlling means for said feed means adapted likewise to shift said sound-box in said slideway.

4. In mechanism of the class described, the combination of a record support; a sound-box movably mounted and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to variously feed said record support and sound-box relatively to each other; and controlling means for said feed means adapted likewise to raise said styluses from a record and shift said sound-box.

5. In mechanism of the class described, the combination of a record support; a slideway; a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said record support and slideway relatively to each other at different rates of speed; and controlling means for said feed means adapted likewise to raise said weight to render said styluses inoperative and to thereupon shift said sound-box in said slideway.

6. In mechanism of the class described, the combination of a mandrel for the record and a member relatively movable in a direction longitudinal of said mandrel, said member including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said mandrel and member relatively to each other at different rates of speed; and controlling means for said feed means adapted likewise to raise said weight to render said styluses inoperative and to thereupon shift said sound-box in said slide-way.

7. In a phonograph, the combination of a rotary record-carrying mandrel and a member relatively movable in a direction longitudinal of said mandrel, said member including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality

of styluses respectively adapted to operate upon records with threads of different fineness; means adapted to rotate said mandrel, and to feed said mandrel and sound-box relatively to each other; and means adapted to change the rate of such feed movement relatively to the rate of rotation of said mandrel and likewise shift said sound-box to operatively position the corresponding stylus.

8. In a phonograph, the combination of a rotary record-carrying mandrel and a member relatively movable in a direction longitudinal of said mandrel, said member including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon records with threads of different fineness; means adapted to feed said mandrel and member relatively to each other; and means adapted to change the rate of such feed movement relatively to the rate of rotation of said mandrel, and likewise to raise said weight to render said styluses inoperative and thereupon shift said sound-box in said slideway to operatively position the corresponding stylus.

9. In a phonograph, the combination of a sound-box movably mounted and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to variously feed said sound-box; and controlling means for said feed means likewise adapted to shift said sound-box.

10. In a phonograph, the combination of a carriage including a slideway, a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to shift said sound-box in said slideway.

11. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to shift said sound-box in said slideway.

12. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-

box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; feed screws adapted to move said carriage at different rates of speed, respectively; and means for operatively connecting said carriage with either of said feed screws as desired, said means being likewise effective to shift said sound-box in said slideway.

13. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; movable members in said carriage adapted to connect the same with either of said screws as desired; and actuating means for said connecting members, said means being also connected with said sound-box to shift the same in said slideway, substantially as described.

14. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; reciprocal members in said carriage adapted to connect the same with either of said screws as desired; and a cam-plate adapted thus alternately to actuate the same, said cam-plate being also connected with said sound-box so as to shift the same in said slideway, substantially as described.

15. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; spring-pressed plungers in said carriage normally tending to connect the same with said screws; and a rotatable cam-plate adapted in one position to retain both said plungers inoperative, but to permit their operation,

respectively, upon movement in one direction or the other from such position, said cam-plate being connected with said sound-box to shift the same in said slideway, substantially as described.

16. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box: two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; spring-pressed plungers in said carriage normally tending to connect the same with said screws; and a rotatable cam-plate adapted in one position to retain both said plungers inoperative, but to permit their operation, respectively, upon movement in one direction or the other from such position, said cam-plate having rack-and-pinion engagement with said sound-box, whereby rotation of said cam-plate also serves to position said reproducer in said slideway.

17. In a phonograph, the combination of a sound-box movably mounted and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said sound-box; means adapted to variously feed said sound-box: and controlling means for said feed means likewise adapted to raise said styluses from the record and shift said sound-box, substantially as described.

18. In a phonograph, the combination of a carriage provided with a slideway, a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to raise said weight to render said styluses inoperative and to thereupon shift said sound-box in said slideway.

19. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage being provided with a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said sound-box; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to raise said weight to render said styluses

inoperative and to thereupon shift said sound-box in said slideway.

20. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage being provided with a slideway extending transversely of said mandrel; a sound-box mounted on said slideway and including a weight and a plurality of styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said sound-box; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; movable members in said carriage adapted to connect the same with either of said screws as desired; a rotatable cam-plate adapted to control connection of said members with said screws; said cam-plate having rack-and-pinion engagement with said sound-box, whereby rotation of said cam-plate also serves to position said sound-box in said slide-way; and a lever mounted in said carriage and adapted to raise said weight, said cam-plate being connected to operate said lever incidentally to rotation thereof.

21. In a phonograph, the combination of a reproducer movably mounted and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore formed for playing upon threads of different fineness, respectively; means adapted to variously feed said reproducer; and controlling means for said feed means likewise adapted to shift said reproducer.

22. In a phonograph, the combination of a carriage including a slideway, a reproducer mounted on said slideway and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore formed for playing upon threads of different fineness, respectively; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to shift said reproducer in said slideway.

23. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a reproducer mounted on said slide-way and provided with a plurality of styluses respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore formed for playing upon threads of different fineness, respectively; means adapted to feed said carriage at different rates of speed; and con-

trolling means for said feed means likewise adapted to shift said reproducer in said slideway.

24. In a phonograph, the combination of
5 a mandrel for the record and a carriage
movable longitudinally of said mandrel,
said carriage including a slideway extend-
ing transversely of said mandrel; a repro-
ducer mounted on said slideway and pro-
10 vided with a plurality of styluses respec-
tively adapted to operate upon a record in
different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, respec-
15 tively; feed screws adapted to move said
carriage at different rates of speed, respec-
tively; and means for operatively connect-
ing said carriage with either of said feed
screws as desired, said means being likewise
20 effective to shift said reproducer in said
slideway.

25. In a phonograph, the combination of
a mandrel for the record and a carriage
movable longitudinally of such mandrel,
25 said carriage including a slideway extend-
ing transversely of said mandrel; a repro-
ducer mounted on said slideway and pro-
vided with a plurality of styluses respec-
tively adapted to operate upon a record in
30 different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, re-
spectively; two feed screws alined with the
path of travel of said carriage and adapted
35 to move the same at different rates of speed,
respectively; movable members in said car-
riage adapted to connect the same with
either of said screws as desired; and actu-
ating means for said connecting members,
40 said means being also connected with said
reproducer to shift the same in said slide-
way, substantially as described.

26. In a phonograph, the combination of
a mandrel for the record and a carriage
45 movable longitudinally of said mandrel,
said carriage including a slideway extend-
ing transversely of said mandrel; a repro-
ducer mounted on said slideway and pro-
vided with a plurality of styluses respec-
50 tively adapted to operate upon a record in
different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, re-
spectively; two feed screws alined with the
55 path of travel of said carriage and adapted
to move the same at different rates of speed,
respectively; reciprocable members in said
carriage adapted to connect the same with
either of said screws as desired; and a cam-
60 plate adapted thus alternately to actuate
the same, said cam-plate being also con-
nected with said reproducer so as to shift
the same in said slideway, substantially as
described.

27. In a phonograph, the combination of

a mandrel for the record and a carriage
movable longitudinally of said mandrel,
said carriage including a slideway extend-
ing transversely of said mandrel; a repro-
ducer mounted on said slideway and pro- 70
vided with a plurality of styluses respec-
tively adapted to operate upon a record in
different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, re- 75
spectively; two feed screws alined with the
path of travel of said carriage and adapted
to move the same at different rates of speed,
respectively; spring-pressed plungers in said
carriage normally tending to connect the 80
same with said screws; and a rotatable cam-
plate adapted in one position to retain both
said plungers inoperative, but to permit
their operation, respectively, upon move-
ment in one direction or the other from such 8
position, said cam-plate being connected
with said reproducer to shift the same in
said slideway, substantially as described.

28. In a phonograph, the combination of
a mandrel for the record and a carriage
movable longitudinally of said mandrel,
said carriage including a slideway extend-
ing transversely of said mandrel; a repro-
ducer mounted on said slideway and pro-
vided with a plurality of styluses respec-
tively adapted to operate upon a record in
different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, re-
spectively; two feed screws alined with the
path of travel of said carriage and adapted
to move the same at different rates of speed,
respectively; spring-pressed plungers in said
carriage normally tending to connect the
same with said screws; and a rotatable cam-
plate adapted in one position to retain both
said plungers inoperative, but to permit
their operation, respectively, upon move-
ment in one direction or the other from such
position, said cam-plate having rack-and-
pinion engagement with said reproducer,
whereby rotation of said cam-plate also
serves to position said reproducer in said
slideway.

29. In a phonograph, the combination of
a reproducer movably mounted and pro-
vided with a plurality of styluses respec-
tively adapted to operate upon a record in
different positions of said reproducer, said
styluses being furthermore formed for play-
ing upon threads of different fineness, re-
spectively; means adapted to variously feed
said reproducer; and controlling means for
said feed means likewise adapted to raise
said styluses from the record and shift said
reproducer, substantially as described.

30. In a phonograph, the combination of
a carriage provided with a slideway, a re-
producer mounted on said slideway and in-
cluding a floating weight and a plurality of

styluses borne by said weight, said styluses being respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore
 5 formed for playing upon threads of different fineness, respectively; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to raise said weight to render
 10 said styluses inoperative and to thereupon shift said reproducer in said slideway.

31. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel,
 15 said carriage being provided with a slideway extending transversely of said mandrel; a reproducer mounted on said slideway and including a floating weight and a plurality of styluses borne by said weight, said
 20 styluses being respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore formed for playing upon threads of different fineness, respectively; means adapted
 25 to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to raise said weight to render said styluses inoperative and to thereupon shift said reproducer in said
 30 slideway.

32. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said
 35 carriage being provided with a slideway extending transversely of said mandrel; a reproducer mounted on said slideway and including a floating weight and a plurality of styluses borne by said weight, said
 40 styluses being respectively adapted to operate upon a record in different positions of said reproducer, said styluses being furthermore formed for playing upon threads of different fineness, respectively; two feed
 45 screws aligned with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; movable members in said carriage adapted to connect the same with either of said
 50 screws as desired; a rotatable cam-plate adapted to control connection of said members with said screws, said cam-plate having rack-and-pinion engagement with said reproducer, whereby rotation of said cam-plate also serves to position said repro-
 55 ducer in said slideway; and a lever mounted in said carriage and adapted to raise said weight, said cam-plate being connected to operate said lever incidentally to rotation thereof.

33. In mechanism of the class described, the combination of a record support; a movably mounted sound-box provided with a stylus lever; a plurality of styluses borne by
 60 said lever and respectively adapted to operate upon a record in different positions of

said sound-box; means adapted variously to feed said record support and sound-box relatively to each other; and controlling means for said feed means adapted likewise to shift
 70 said sound-box to operatively position the desired stylus.

34. In mechanism of the class described, the combination of a record support; a movably mounted sound-box provided with a floating weight and a stylus lever attached
 75 to said weight; a plurality of styluses borne by said lever and respectively adapted to operate upon a record in different positions of said sound-box; means adapted variously to feed said record support and sound-box
 80 relatively to each other; and adapted likewise to raise said weight to lift said lever and styluses and thereupon shift said sound-box to operatively position the desired stylus.

35. In a phonograph, the combination of a reproducer movably mounted and provided with a stylus lever; a plurality of styluses borne by said lever and respectively
 85 adapted to operate upon a record in different positions of said reproducer; means adapted to variously feed said reproducer; and controlling means for said feed means likewise adapted to shift said reproducer.

36. In a phonograph, the combination of
 95 a carriage including a slideway, a reproducer mounted on said slideway and provided with a stylus lever; and a plurality of styluses borne by said lever and respectively adapted to operate upon a record in
 100 different positions of said reproducer; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to shift said reproducer in said slideway.

37. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending
 110 transversely of said mandrel; a reproducer mounted on said slideway and provided with a stylus lever; a plurality of styluses borne by said lever and respectively adapted to operate upon a record in different positions of said reproducer; means
 115 adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to shift said reproducer in said slideway.

38. In a phonograph, the combination of
 120 a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending transversely of said mandrel; a reproducer mounted on said slideway and provided with a stylus lever; a plurality of styluses borne by said lever and respectively
 125 adapted to operate upon a record in different positions of said reproducer; feed screws adapted to move said carriage at different

rates of speed, respectively; and means for operatively connecting said carriage with either of said feed screws as desired, said means being likewise effective to shift said 5 reproducer in said slideway.

39. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending 10 transversely of said mandrel; a reproducer mounted on said slideway and provided with a similarly extending stylus lever; a plurality of styluses borne by said lever and respectively adapted to operate upon a record 15 in different positions of said reproducer; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; movable members in said carriage 20 adapted to connect the same with either of said screws as desired; and actuating means for said connecting members, said means being also connected with said reproducer to shift the same in said slideway, substantially 25 as described.

40. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage including a slideway extending 30 transversely of said mandrel; a reproducer mounted on said slideway and provided with a similarly extending stylus lever; a plurality of styluses borne by said lever and respectively adapted to operate upon a record 35 in different positions of said reproducer; two feed screws alined with the path of travel of said carriage and adapted to move the same at different rates of speed, respectively; reciprocable members in said carriage 40 adapted to connect the same with either of said screws as desired; and a cam-plate adapted thus alternately to actuate the same, said cam-plate being also connected with said reproducer so as to shift the same in 45 said slideway, substantially as described.

41. In a phonograph, the combination of a movably mounted reproducer provided with a stylus lever; a plurality of styluses borne by said lever and respectively adapted 50 to operate upon a record in different positions of said reproducer; means adapted to variously feed said reproducer; and controlling means for said feed means likewise adapted to raise said styluses from the record 55 and shift said reproducer, substantially as described.

42. In a phonograph, the combination of a carriage provided with a slideway; a reproducer mounted on said slideway and including a floating weight and a stylus lever 60

attached to said weight; a plurality of styluses borne by said lever, said styluses being respectively adapted to operate upon a record in different positions of said reproducer; means adapted to feed said carriage at different rates of speed; and controlling means 65 for said feed means likewise adapted to raise said weight to render said styluses inoperative and to thereupon shift said reproducer in said slideway. 70

43. In a phonograph, the combination of a mandrel for the record and a carriage movable longitudinally of said mandrel, said carriage being provided with a slideway extending transversely of said mandrel; 75 a reproducer mounted on said slideway and including a floating weight and a stylus lever likewise extending transversely of said mandrel; a plurality of styluses borne by said lever, said styluses being respectively 80 adapted to operate upon a record in different positions of said reproducer; means adapted to feed said carriage at different rates of speed; and controlling means for said feed means likewise adapted to raise 8 said weight to render said styluses inoperative and to thereupon shift said reproducer in said slideway.

44. In a phonograph, the combination of a mandrel for the record and a carriage 9 movable longitudinally of said mandrel, said carriage being provided with a slideway extending transversely of said mandrel; a reproducer mounted on said slideway and including a floating weight and a stylus lever attached to said weight; a plurality of styluses borne by said lever, said styluses being respectively adapted to operate upon a record in different positions of said reproducer; two feed screws alined with the path 10 of travel of said carriage and adapted to move the same at different rates of speed, respectively; movable members in said carriage adapted to connect the same with either of said screws as desired; a rotatable cam-plate adapted to control connection of said members with said screws, said cam-plate having rack-and-pinion engagement with said reproducer, whereby rotation of said cam-plate also serves to position said reproducer in said slide-way; and a lever 15 mounted in said carriage and adapted to raise said weight, said cam-plate being connected to operate said lever incidentally to rotation thereof.

Signed by me this 17th day of May, 1909.

HARRY B. McNULTY.

Attested by—

ANNA L. GILL,
JNO F. OBELIN.