June 5, 1934. F. I. LAUTER 1,961,369

MECHANICAL MUSICAL INSTRUMENT

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Fig. 1.

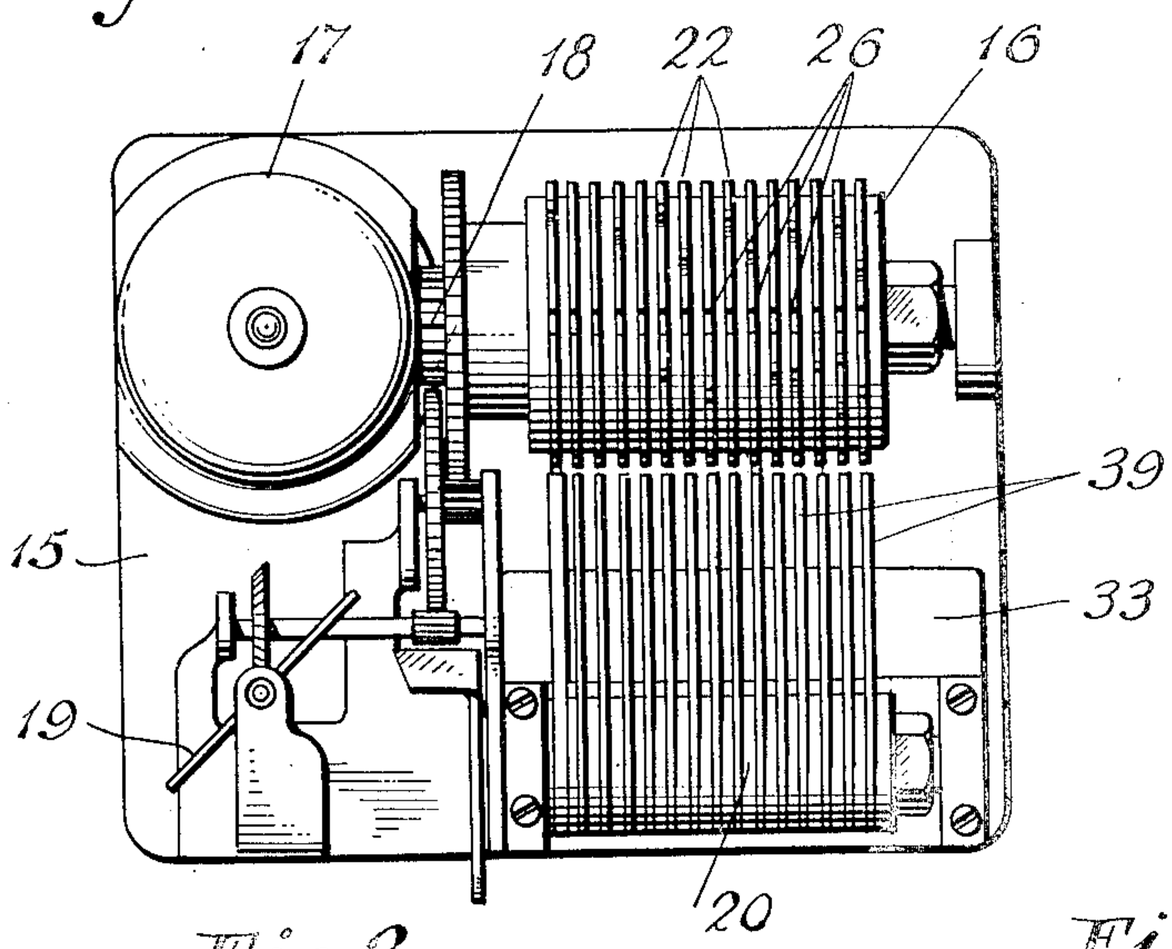

Fig. 2.

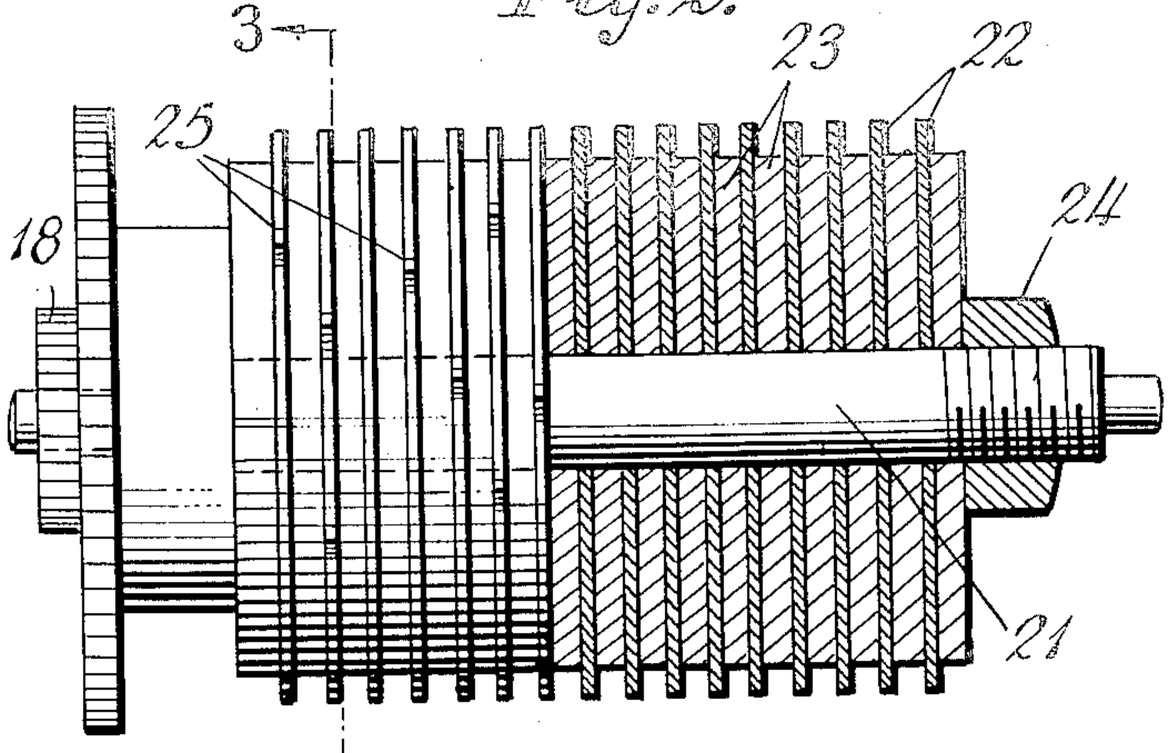

Fig. 3.

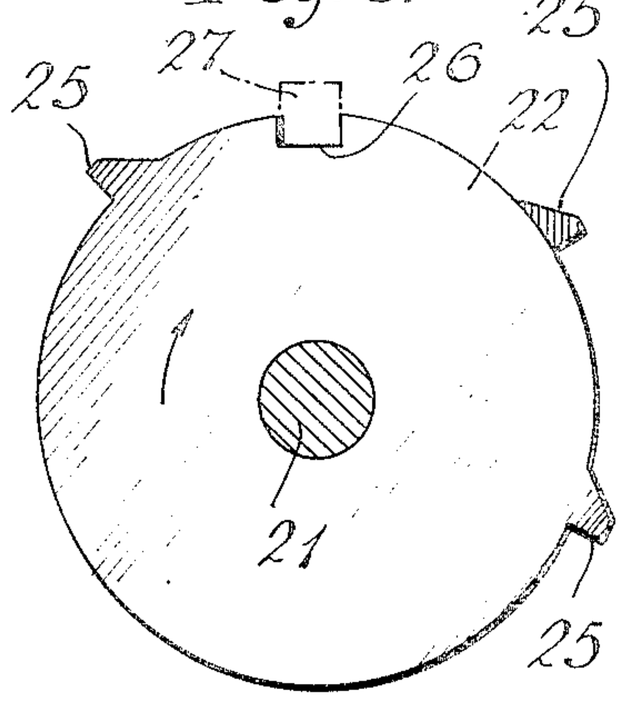

Fig. 4.

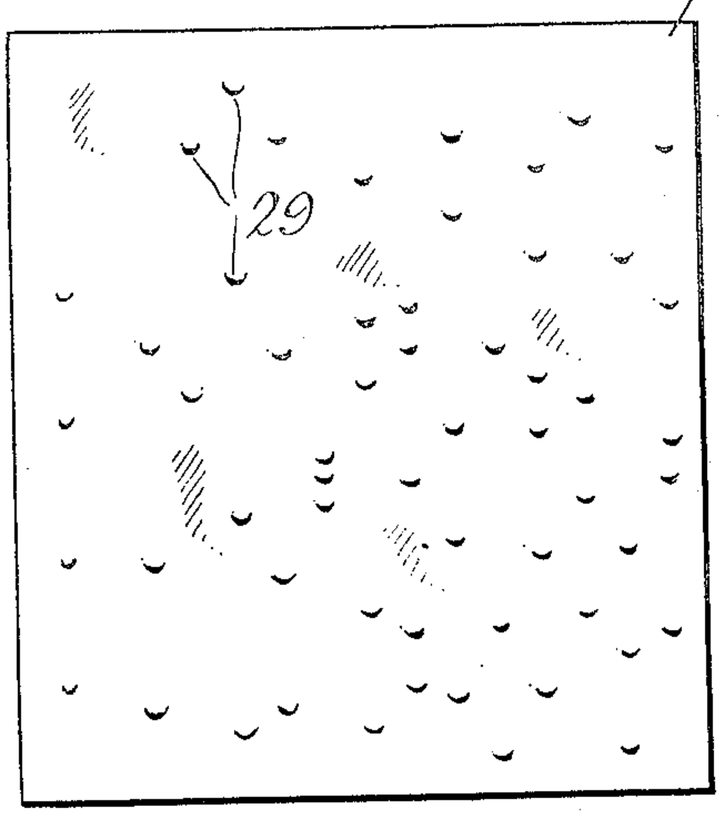

Fig. 5.

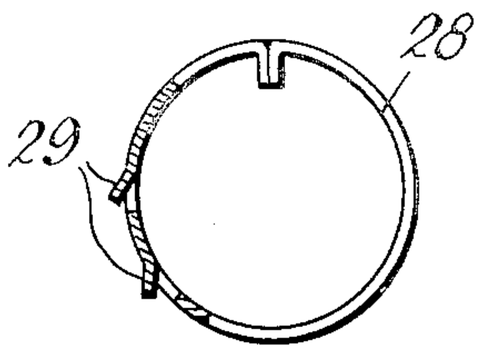

Fig. 6.

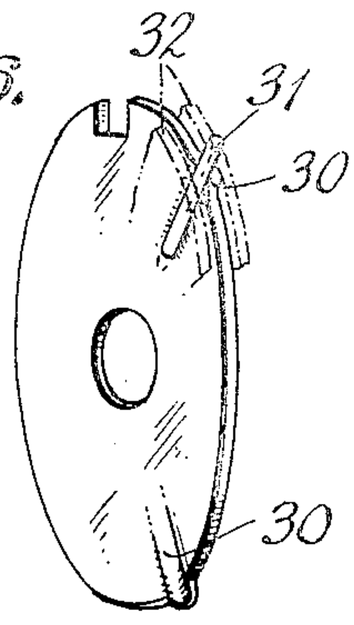

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Fig. 7.

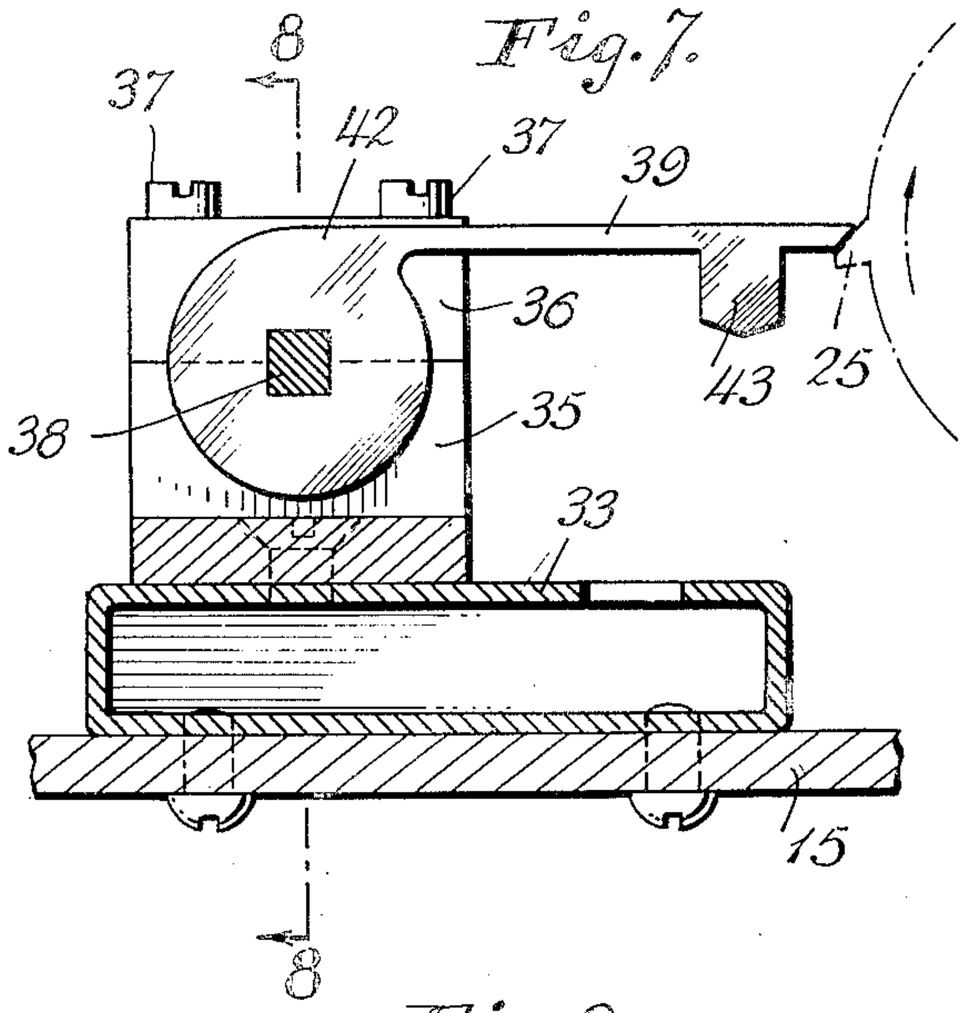


Fig. 8.

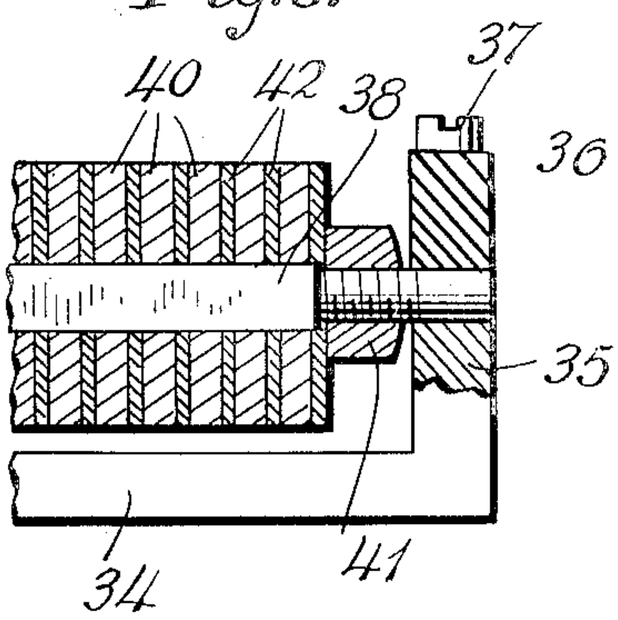


Fig. 9.

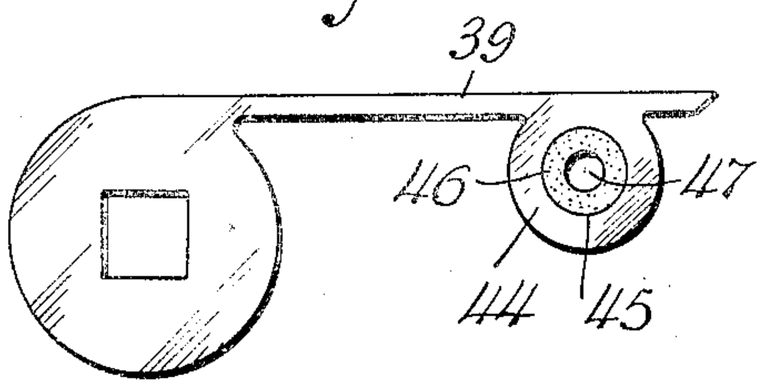


Fig. 10.

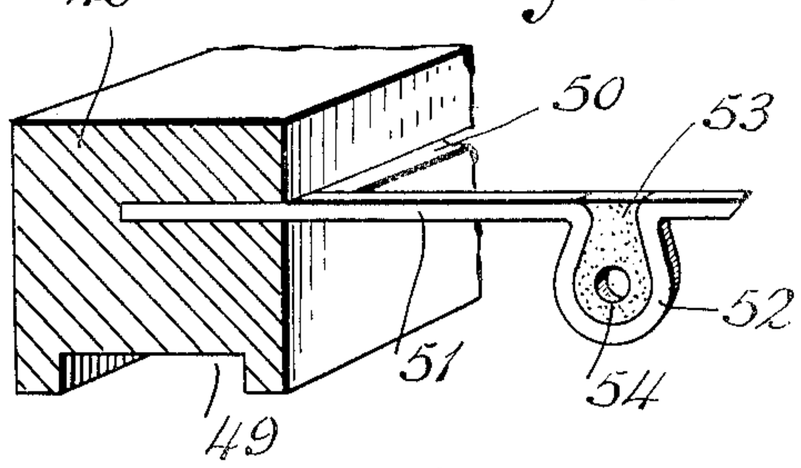


Fig. 11.

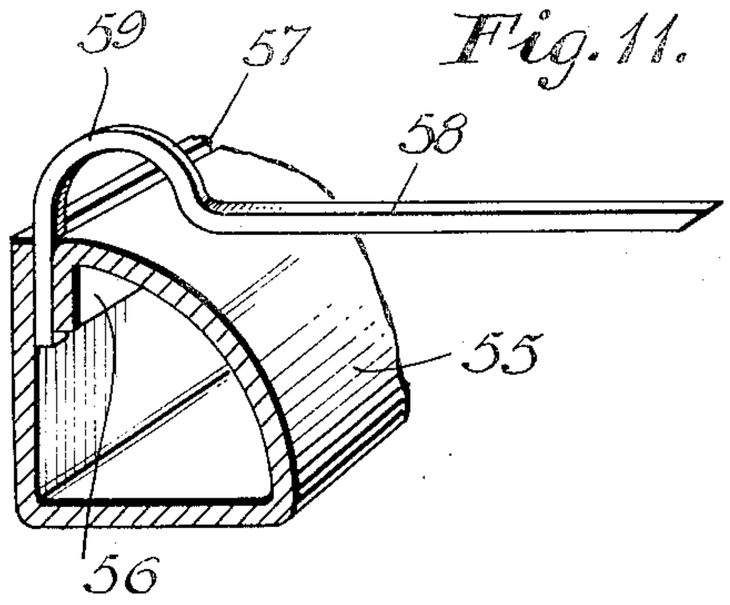


Fig. 12.

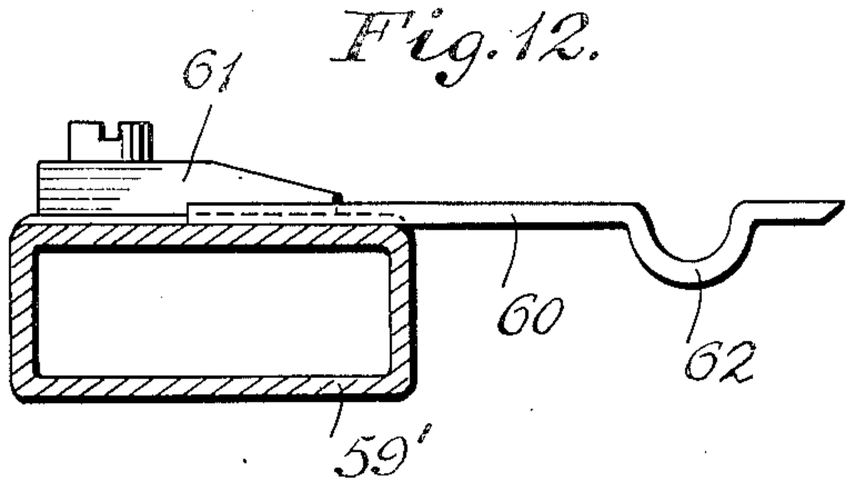
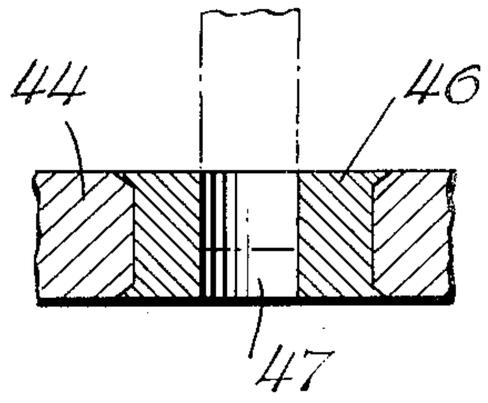


Fig. 13.



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Patented June 5, 1934 1,961,369

UNITED STATES PATENT OFFICE

1,961,369

MECHANICAL MUSICAL INSTRUMENT

Fred I. Lauter, Brooklyn, N. Y., assignor of one-half to David H. Hoffman, New York, N. Y.

Application November 6, 1931, Serial No. 573,334

9 Claims. (Cl. 84—95)

This invention relates to improvements in musical instruments and has particular reference to an instrument of the mechanically operated kind.

Musical instruments of the type generally disclosed herein employ a cylindrical record and a sounding device in the nature of a tuned comb consisting of a number of fingers engageable with and operated by prongs on said cylinder to produce the desired tones.

Heretofore, as far as is known, the comb has been made from a single piece of metal, such as steel, and cut to provide the series of fingers, after which, through manual operations which have been found to be tedious and time consuming, each finger of the comb is weighted, by the application of solder or the like thereto, until the finger produces the desired tone when vibrated. Other difficulties in the construction of the record cylinders, which have hitherto been made from a solid piece of metal with integral prongs, have been encountered.

The present invention has been designed to overcome the above-noted difficulties by constructing the record cylinder and the tuned comb each of a plurality of individual elements, thereby simplifying the construction and assembly of each of said members and materially reducing the cost of production.

The inventive idea involved is capable of receiving a variety of mechanical expressions, some of which, for purposes of illustration, are shown in the accompanying drawings, wherein

Figure 1 is a top plan view of the instrument constructed in accordance with the invention;

Figure 2 is an enlarged elevation, partly in section, of one form of record cylinder;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is a plan view of a blank from which another form of cylinder is constructed;

Figure 5 is an end elevation, partly in section, of the cylinder formed from the blank of Figure 4;

Figure 6 is a perspective view of a slightly different form of disk from that shown in Figure 3;

Figure 7 is a longitudinal section through one form of sounding device employed in connection with the invention;

Figure 8 is a section on the line 8—8 of Figure 7;

Figure 9 is a side elevation of a slightly different form of tuned finger from that shown in Figure 7;

Figure 10 is a fragmentary perspective view, partly in section, of another form of sounding device;

Figure 11 is a similar view of still another form;

Figure 12 is a side elevation, partly in section, of still another form of sounding device; and

Figure 13 is an enlarged fragmentary transverse section through the weighting means used in conjunction with the fingers illustrated in Figures 9 and 10.

In Figure 1, the instrument is shown as comprising a base-plate 15 which supports the various instrumentalities constituting the invention. Mounted above said base-plate is a record cylinder generally indicated by the numeral 16, the details of which will be presently described. This cylinder is driven by a prime mover in the form of a spring motor 17 of the usual type employed in such instruments and, through the customary train of gearing generally indicated by the numeral 18, the speed of the motor 17 is controlled by a governor 19. Mounted in cooperating relation with the rotatable cylinder 16 is a sounding device 20 in the nature of a comb consisting of a plurality of tuned fingers, each adapted to be engaged by projections on the record cylinder 16 and vibrated thereby to produce the desired melody.

One form of record cylinder is illustrated in Figures 2 and 3, wherein it will be observed that the cylinder comprises a shaft 21 upon which is mounted a plurality of separate disks 22 and interposed between these disks are spacing elements, such as washers 23. When all of the disks constituting the record cylinder are mounted in position on the shaft 21, the same are secured thereon by means of a nut 24 threaded upon one end of said shaft. Each disk 22 is provided with one or more projections or prongs 25 extending from the periphery of the disk at predetermined intervals so that said prongs will successively engage one of the fingers of the sounding device 20 to produce the note individual to said finger at the proper instant in the playing of a melody. In order that the various disks may be mounted upon the shaft 21 in their predetermined relation to each other, so that the prongs 25 of the various disks will engage the finger of the sounding device individual thereto at the proper moments, each disk is provided in its periphery with a notch 26 which is aligned with the notches of all of the other disks when the latter are mounted upon the shaft 21. A bar 27 (Figure 3) is then inserted into the aligned notches so as to keep the various disks in their respective positions until the nut 24 has been tightened, whereupon said bar is removed and the record cylinder is then ready for operation.

In Figure 4, the record cylinder is shown as be-

ing made from a rectangular sheet of any suitable metal 28, from which is struck the various prongs 29 formed in circumferential rows about the cylinder after it has been rolled and shaped, as shown in Figure 5. The various prongs of the different rows are arranged so as to engage the associated fingers of the sounding device at the proper intervals.

In Figure 6, a slightly different form of disk is shown from that illustrated in Figure 3, and involves the formation in the disk of the desired number of radially extending grooves 30, which communicate with the periphery of the disk and are adapted to receive pins 31 which are the equivalent of the projections or prongs 25. The disk of Figure 6, like that of Figure 3, is mounted upon the shaft of the record cylinder and has disposed on opposite sides thereof spacing elements 32, similar to the elements 23, which combine to retain the pins 31 in place and maintain the disks in spaced relation on the shaft.

The form of sounding device illustrated in Figures 1, 7 and 8 will now be described. This sounding device comprises a hollow base 33 which is secured to the base-plate 15 and constitutes a sound box. Mounted upon the base 33 and extending the width thereof is a supporting bracket 34, the upright ends of which each comprise a lower section 35 and a removable upper section 36 secured in place by screws 37, said sections combining to constitute a bearing for one end of a shaft 38, the central portion of which is rectangular in cross-section. Before the shaft is so mounted in position, a plurality of individual tuned fingers 39 are mounted thereupon between spacing elements 40. Thereafter, the nut 41 is threaded upon the shaft to clamp the various fingers and spacing elements in position. Each of these fingers is formed from a suitable material, such as steel, and is provided at one end thereof with a disk 42 having a central aperture therein adapted to receive the squared portion of the shaft 38. Adjacent the free end of each finger 39, which is contacted by the projections on the associated disk of the record cylinder, the same is provided with an enlargement 43 constituting a weight which has the effect of increasing or decreasing the vibratory action of the finger after it has been flexed by one of the projections 25. This weight for each individual finger is varied so that the finger will produce the desired tone when vibrating.

When the fingers are made in accordance with the disclosure of Figure 9, the enlargements 44 are all made of the same size and, in this instance, are provided with apertures 45 for receiving weights 46 made of lead or other suitable material. Each weight is provided with an opening 47 for receiving a reaming tool, as indicated in Figure 13, which may be inserted into said opening and operated to remove some of the material of the weight so as to reduce its effective size and thereby secure the desired tone from the finger when it is vibrated.

In Figure 10, the base of the sounding device is shown as formed from a block 48 having a recess 49 extending the length of the bottom thereof, one face of the block being provided with a longitudinal groove 50 adapted to receive the inner ends of the fingers 51, only one of which is illustrated. The fingers may be secured in the groove 50 in any desired manner, as by close fit, or by soldering. In this embodiment, each finger 51 is provided adjacent its outer extremity with a bowed portion 52, in which is engaged a lead weight 53 having an opening 54 for the same purpose as described in connection with the weight 46.

Figure 11 illustrates another modification of sounding device, in which the hollow base 55 is made of sheet material bent into substantially segmental form in cross-section, with one longitudinal edge 56 of the sheet bent inwardly and cooperating with the other edge thereof to form a groove 57 in which the inner ends of a plurality of fingers 58 are adapted to be secured. Said inner end of each of the fingers 58 is provided with a bowed portion 59 and the tone produced by the finger is regulated by the curvature of said bow and the size thereof.

Still another embodiment of the invention is illustrated in Figure 12, in which the hollow base 59′ has a plurality of fingers 60 secured upon its upper surface by means of a clamping bar 61. Each finger 60 adjacent its outer end is provided with a bowed portion 62, similar in function to the bowed portion 59 of Figure 11.

What is claimed is:

1. In a musical instrument, a record cylinder, a sounding device cooperating therewith and including a plurality of tuned fingers, each engageable with said record, supporting means upon which said fingers are separately mounted, spacing elements between adjacent fingers, and means to rotate said cylinder.

2. A sound record for musical instruments, comprising a plurality of disks, each having one or more radially extending grooves, a prong in each groove extending beyond the periphery of the disk, and a support for said disks.

3. A sounding device for musical instruments, comprising a hollow base constituting a sounding board, and a plurality of fingers individually mounted upon said base and extending laterally therefrom, the mounting portions of said fingers being individually mounted upon said base in such a manner that they will be substantially spaced and separated from each other, said mounting portions having substantially the same width as the width of the fingers.

4. A sounding device for musical instruments, comprising a base, a plurality of fingers individually mounted upon said base and extending laterally therefrom, and spacing elements on said base interposed between adjacent fingers.

5. A sounding device for musical instruments, comprising a hollow base constituting a sounding board, a supporting bracket on said base having separable end members, a shaft secured between said members, a plurality of separate fingers individually mounted upon said shaft and separate spacing elements interposed between adjacent fingers.

6. A sounding device for musical instruments comprising a base, a plurality of fingers individually mounted upon said base and extending laterally therefrom, each of said fingers having an enlargement thereon, the weight and the size of which may be varied and mounted in said enlargement.

7. In a musical instrument, a sounding device, a record cylinder cooperating therewith, said cylinder including a plurality of separate flat metallic discs each having projecting prongs to engage the sounding device, each of said discs being provided with a central circular opening, a rod passing through said central openings and serving as a means to assemble said discs to form said cylinder, flat circular solid plate spacing elements of substantially less diameter than said discs and in-

terposed therebetween, means to operate said cylinder, each of said discs being provided with corresponding notches along the periphery thereof, said notches being adapted to cooperate with a locking means consisting of a bar to be placed therein while the discs are being clamped so as to position the same properly to form a cylinder.

8. A sounding device for musical instruments comprising a base, a plurality of fingers individually mounted upon said base and extending laterally therefrom, and a mounting arrangement consisting of a rod carried by said base, a plurality of discs carried by said fingers with corresponding openings, whereby said discs may be placed upon said rod and said fingers may be aligned, and clamping means to clamp said fingers together upon said rod.

9. A sounding device for musical instruments, comprising a base, a plurality of fingers individually mounted upon said base and extending laterally therefrom, each of said fingers having an enlargement thereon and means carried by said enlargement including a weight of variable mass for producing a characteristic tone when the finger is vibrated, the mass of said weight being variable by means of an opening therethrough adapted to receive a reaming tool whereby the effective mass may be reduced.

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