

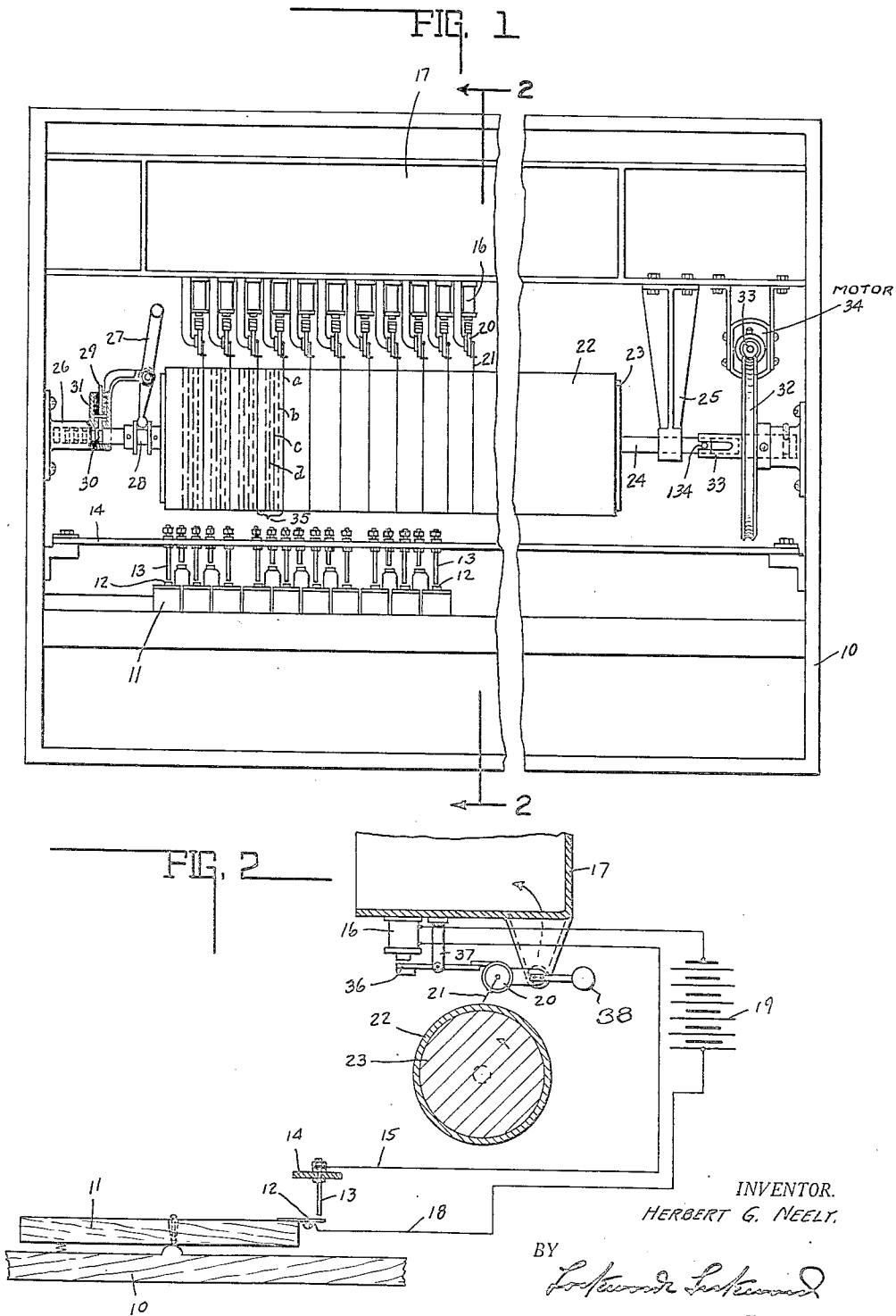
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SOUND PRODUCING DEVICE

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UNITED STATES PATENT OFFICE

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SOUND-PRODUCING DEVICE

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This invention pertains to a musical instrument of a novel character as will be hereinafter more fully set forth and described.

The principal object of the invention is to provide a musical instrument which may be operated by piano keys or any other musical or mechanical means for reproducing sounds such as organ notes, sounds from string and wind instruments and the like from a previously prepared record at the selection of the operator.

This is accomplished by providing a record, which may be either in the form of a cylinder record or a disc record of the usual character which will have groups of sound producing grooves, each group representing a certain note in the scale and being continuous so as to continue to render the same note upon rotation of the record. Each group comprises a plurality of grooves bearing the same note but having different tones or being produced from different instruments. For instance, in one group there will be an individual circular groove which will reproduce a key note of the scale as produced on the record by an organ. Another groove of the same group will produce the same note as rendered by a violin. Another groove in the group will produce the same note as rendered by a horn or wind instrument, etc. For reproducing the sound from each group there is provided a needle and sound box of the type commonly used in talking machines, which needle may be raised or lowered into contact with one of the grooves electrically either by manual or automatic means, such as the keyboard of a piano.

Another feature of the invention resides in the selection of the instrumental tones to be used, which may be accomplished by a shifting of the position of the record so that the battery of sound reproducing needles will fall upon their respective groups and engage the groove reproducing the tone of a given instrument.

The full nature of the invention will be understood from the accompanying drawings and the following description and claim.

Fig. 1 is a front elevation of the instrument, partly in section. Fig. 2 is a section taken

on the line 2—2 of Fig. 1 showing diagrammatically the electrical connections.

In the drawings there is shown a box or housing 10 which may be positioned in a piano casing or similar type of instrument, the same being provided with the usual type of keyboard having the keys 11 mounted thereon. At the rear of each key there is a make and break switch having a contact 12 mounted on the key and the fixed contact 13 mounted upon the supporting bar 14, the contact 13 being insulated therefrom and having an electrical connection 15 with a solenoid 16 supported from the under side of the amplifier 17. The contact 12 is connected by the connection 18 with a suitable source of current 19 which in turn is connected with the solenoid 16 so as to energize the same when contact is made between the switch elements 12 and 13.

Pivottally mounted on the amplifier 17 extending from under the same there is a sound reproducing diaphragm 20 having the usual needle 21 in position to engage and make contact with given sound reproducing grooves in the cylindrical record 22. A counterbalance 38 is attached to the sound reproducing device 20 having its weight adjusted so as to nearly counterbalance the weight of the device 20.

The record 22 is mounted on a cylindrical support 23 which is provided with a shaft 24 supported at one end in the bearing bracket 25 and the other end in the bearing box 26. Said cylindrical support may be adjusted laterally by means of the handle 27 engaging between the collars 28. The adjusted position thereof is retained by the spring pressed plunger 29 engaging in the grooves 30 provided on one end of said shaft, said plunger being mounted in a box 31 to which the handle 27 is pivoted, said box being rigid with the bearing 26.

The shaft and cylinder are driven through the spiral gear 32 by means of a worm gear 33, said worm gear being driven by an electric motor 34. The spiral gear 32 is provided with a bifurcated projection 33 in which one end of the shaft 24 is mounted, said shaft being provided with the pin 134 ex-

tending into the bifurcation thereof so that the rotation of the gear 32 will rotate the cylinder while at the same time said cylinder will be capable of lateral adjustment.

Said cylinder is provided with a plurality of separate and individual circular sound reproducing grooves *a, b, c, d*, etc., making up a single tone group 35. It will be noted that a separate needle diaphragm and solenoid is positioned above each group and the lateral adjustment of the record is such that the needles will engage the desired grooves in each group for reproducing the sound of a given instrument. For instance, upon one adjustment of the record each needle will engage the groove *a* of its respective group. On another adjustment thereof, each needle will engage the groove *b* of each group.

In operation, it will be assumed that it is desired to produce a composition as rendered by an organ. The record has previously been made so that the grooves *a* of each group have been produced from a given note of an organ, each group representing one of the tones of the scale. The cylinder thus produced is adjusted so that the needles 21 when lowered will engage the groove *a* of each group. Each needle, and therefore each group, is electrically associated with one of the keys of the keyboard. Therefore as the musician, or mechanical instrument operates the keyboard, by depressing one of the keys 11, it will complete the circuit through the solenoid 16, energizing the same for attracting the bar 36 which is pivoted on the bracket 37, thus causing the opposite end of said bar to be lowered thereby lowering the needle 21 onto the groove *a* of one of the groups 35 on the record. The record revolving at the desired speed will accordingly give out through the amplifier the tone of the organ as represented by the key which has been depressed. The end of the bar 36 adjacent to the solenoid is made of sufficient weight to lift the reproducing device 20 from the record when the solenoid 16 is deenergized. In a similar manner, by operating the keyboard in the usual way, a musical composition may be rendered in the tones of an organ by depressing groups of keys in timed relation.

Wherein other grooves in each group of the record have been produced from the sound of string or wind instruments or the like, by shifting the position of the record, the tones thereof may be reproduced in the same manner as above described. Thus it will be observed that by means of this instrument, which may be conveniently arranged and installed in pianos mechanical player pianos, or in separate cabinets, one may enjoy at his selection an organ recital, a violin or cello recital, and by properly arranging the grooves on the record and the keyboard an orchestration may be reproduced. Such selections or musical compositions may thus

be rendered at the option of the musician by playing the key board from the usual sheet music.

The invention claimed is:

In a sound reproducing instrument, the combination of a rotatably mounted record having a plurality of coaxial endless tonal grooves thereon, said tonal grooves being arranged in groups according to the same tone, the several grooves of each group for that tone being adapted to reproduce that particular tone of a particular instrument, voice or combination thereof, a single record engaging needle for each tonal group, a common amplifier, a vibrating mechanism for each needle in communication with the common amplifier, a single set of keys of musical scale character, one for each needle, means for causing said needle to engage the record and disengage said needle therefrom a connection between each of the aforesaid means and the respective key for securing operation of said needle into engaging and disengaging position, the duration of needle engagement and sound reproduction being substantially that of key actuation controlling the same, and means for shifting said record relative to said needles for securing predetermined reproduction of the tone of the desired instrument.

In witness whereof, I have hereunto affixed my signature.

HERBERT G. NEELY.