Jan. 3, 1939. A. FUSCHI 2,142,391

TONE MODIFYING APPARATUS

Filed Feb. 25, 1937

Fig. 1.

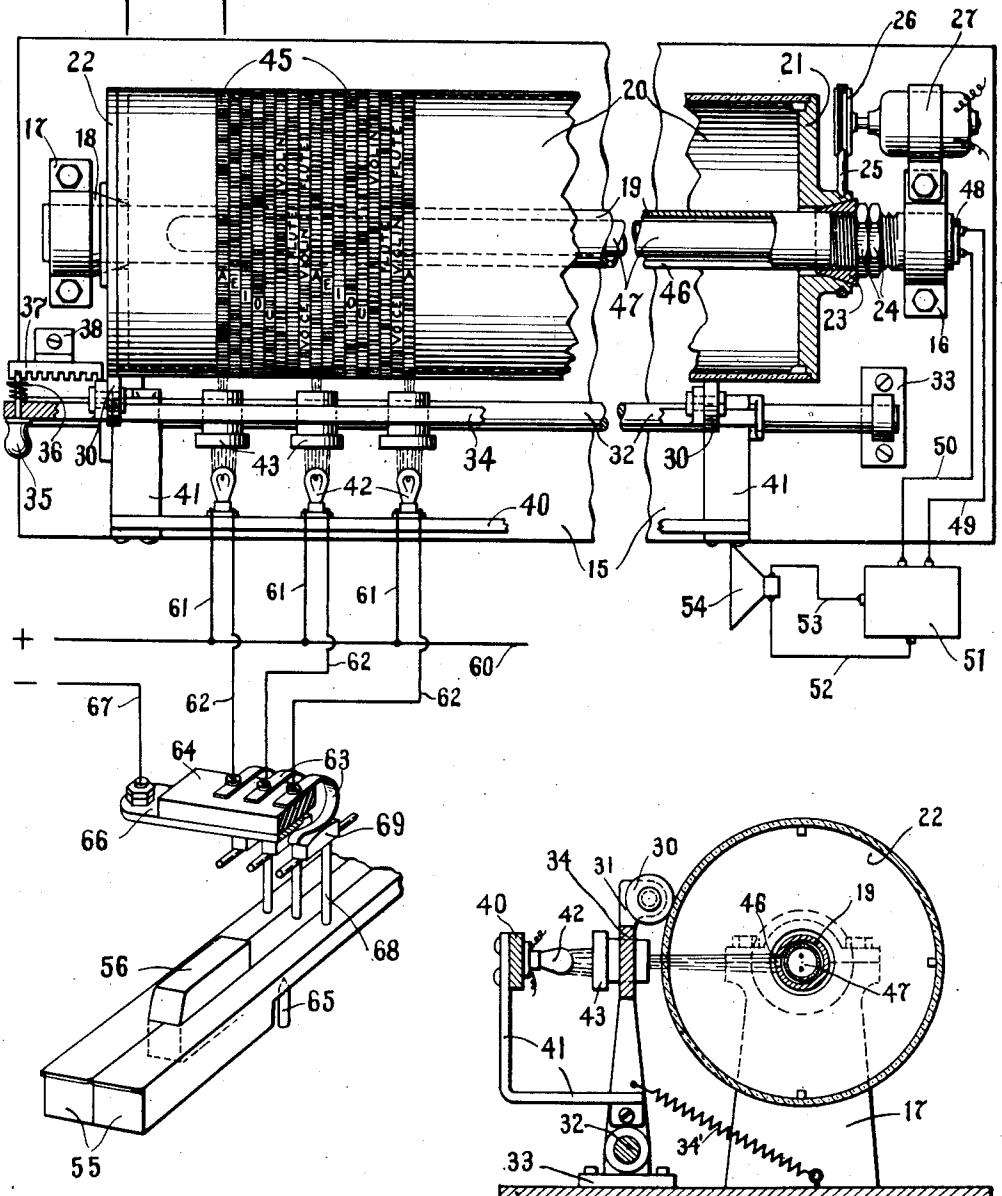


Fig. 2.

INVENTOR
Antonio Fuschi
BY
Marvin Deming
ATTORNEY

Patented Jan. 3, 1939 2,142,391

UNITED STATES PATENT OFFICE

2,142,391

TONE MODIFYING APPARATUS

Antonio Fuschi, New York, N. Y.

Application February 25, 1937, Serial No. 127,711

3 Claims. (Cl. 84—1)

This invention relates to instrumentalities for reproducing sound and has as its object to provide an instrument whereby the tonal pitch and timbre of sound imparted by a piano may be varied in volume and intensity.

A further feature is in the provision of means whereby the sound from a variety of different musical instruments may be harmoniously blended and correctly rendered, either direct or through a radio apparatus.

Another aim is to provide an apparatus, the tone range of which is at least equal to that of the human voice and all ordinary musical instruments.

A further purpose is to produce an electrically actuated device having the foregoing features, that can be used as an entity, or combined with any conventional type of piano.

These and other advantageous objects are accomplished by the novel construction, combination and arrangement of parts hereinafter described and illustrated in the accompanying drawing, constituting an essential component of this disclosure, and in which:—

Figure 1 is a partial plan, partial sectional view of an embodiment of the invention, parts of a piano being in perspective.

Figure 2 is a transverse sectional view taken through the body of the instrument as shown in Figure 1.

Referring in greater detail to the drawing, the numeral 15 designates a base plate having near its ends raised bearing blocks 16 and 17, respectively right and left.

A conical bearing sleeve 18 is clamped tightly in the block 17 by its cap and fixed in the sleeve is an opaque tube 19 extending through to the bearing in the block 16.

A transparent cylinder 20, has fixed in its ends discs 21 and 22, the latter having its hub rotatably engaged on the sleeve 18, while the disc 21 is similarly mounted on a conical sleeve 23 on the tube 19, the cylinder being adjusted to properly fit by nuts 24 screw threaded on the tube 19.

The hub of the disc 21 is elongated to receive the sleeve and is grooved to act as a pulley for a belt 25 trained thereover and driven by the pulley 26 of an electric motor 27, so as to rotate the cylinder 20.

In addition to the take-up features of the conical sleeves 18 and 23, by which the cylinder is held revolubly, but free from end play or looseness, a pair of rolls 30 are pressed against the end portions of the periphery of the cylinder, these rolls being mounted in the raised ends of levers 31 fixed on a shaft 32 journalled in bracket bearings 33 secured to the base plate 15, tension springs 34' drawing the lever carried rolls against the cylinder.

The levers 31 are rigidly connected by a bar 34 extending therebetween, one end of the bar being provided with a knob actuated detent 35, normally drawn inwardly by a compression spring 36, causing the detent to engage selectively with the spaces of a rack 37 held by a bracket 38 to the base plate 15.

Another bar 40 is supported by angle brackets 41 adjustably attached to the levers 36, this bar carrying electric light bulbs 42 which register with lenses 43 set in the bar 34; thus it will be seen that any movement of the rolls 30 is transmitted to the lights and lenses without relative movement between them.

Arranged on the cylinder 20 are a series of encircling bands 45, each band consisting of a strip of sound film, carrying tones, those at one end corresponding to the vowel sounds a, e, i, o, u, followed by the tones of a violin flute and human voice, and then repeated throughout the length of the cylinder.

It may be noted that the notches or spaces between the teeth of the rack 31 degree in spaced relation with the bands 45 and that eight constitute a set, after which the next set is a half tone higher progressively, furthermore the lights and lenses are centered on the selected film record by shifting the detent 35 in accordance with requirements.

Returning to the opaque tube 19, it will be seen to have a single longitude slot 46, and housed axially in the cylinder is a transparent glass tube 47, constituting one of the members of a photo-electric cell, held stationary and provided with a cap 48 having electric connections 49 and 50 leading to an amplifier 51 which is connected by conductors 52 and 53 with a loud speaker 54, the light passing through the lens, film record and slotted tube, causing vibration of the electric cell.

If desired the conductors 49—50 may be connected directly to any conventional type of radio instrument, parts 51 to 54 being eliminated.

As illustrated, the entire apparatus, except the last named elements, may be installed within the housing of a piano, as indicated by the fragments of a key-board having keys 55 and 56.

In this case an electrical current, supplied by conductor 60, has branches 61 leading to the light bulbs 42, return current being led by conductor 62

to spring contacts 63 secured on a bar 64 of insulating material supported over the rear ends of the piano keys, which are pivoted, as at 65.

The bar 64 rests on a conductor bar 66 having a return conductor 67.

The spring contacts 63 are curved into a generally U shape, their lower elements extending under the conductor bar 66 in normal spaced relation to it.

Posts 68 extending upwardly from the rear end of each piano key, carry at their upper ends pressure elements 69, adapted, when the key is depressed as in playing the instrument, to impinge on the lower member of the corresponding contact, causing it to rise and engage the conductor bar 66, thus completing an electric circuit whereby the corresponding bulb glows and light is transmitted through the lens alined with it, thence through the sound record against which the lens is directed, to cause light to pass through the slot 46 in the tube 19, upon the photo-electric cell element 47.

Thus it will be obvious that any key depressed will evoke a corresponding note and that the same may be sustained indefinitely long, until the key is released. The arrangement and position of the bars 64—66 relative to the piano keys may be varied at will, it being required only that any key depressed will operate to form an electric contact.

Due to the set of 8 record bands, the sound produced may be greatly modified in its tonal qualities according to such as are selected, and which embrace a range of many string and wind instruments and human voices, the piano being played in the usual manner.

Although the foregoing is descriptive of the best known embodiment of the invention, it is not to be regarded as limitative of the same as changes and modifications may be made within the scope and tenor of the appended claims.

Having thus described the invention and set forth the manner of its construction, purpose and use, what is claimed as new and sought to secure by Letter Patent, is:—

1. A symphonic musical instrument comprising a plural series of imperforate endless film bands bearing sound and pitch records, a rotatable transparent cylinder on which said bands are mounted in juxtaposition, lens concentrating light rays on selected bands, means to adjust said lens selectively from one bend to another, a photo-electric cell fixed axially within said cylinder, resilient means to maintain said lens at a definite distance from said cylinder irrespective of imperfections thereon, and a sound producing instrumentality actuable by said cell.

2. In a tone modifying apparatus comprising a transparent cylinder having a plurality of endless imperforate record film bands disposed in juxtaposition thereon in groups of eight, each group containing the vowel sounds a, e, i, o, u, a violin, flute and voice respectively, adjacent groups uniform therewith and varying in pitch, a photo-electric cell disposed centrally within said cylinder, a slotted opaque guard therefor, a series of electric bulbs electrically energized by the keys of the musical instrument of the piano type, lens to direct light rays from said bulbs on said bands selectively, a shiftable frame carrying said bulbs and lens, means to retain said frame when in adjustment, spring impelled lever supports for said frame, rolls on said frame impinging on said cylinder, and a sound producing device actuable by said cell.

3. In a tone modifying apparatus, a base plate, a cylinder rotatably mounted thereon, a series of sets of eight imperforate film record bands on said cylinder, each band having identical pitches and each set modulated from adjacent sets, the cylinder and bands translucent, a photo-electric cell axially within said cylinder, a guard tube for said cell having a single slot for the passage of light, sound producing means energizable by said cell, an electric light bulb associated with each set, lens to direct rays of light therefrom to said cell, a frame carrying said light bulbs and lens, a rack fixed on said base plate, a detent on said frame engageable with said rack whereby the light bulb and lens may be trained selectively on any of said record bands, and means controlled by the keys of an instrument of the piano type to cause said light bulbs to glow.

ANTONIO FUSCHI.