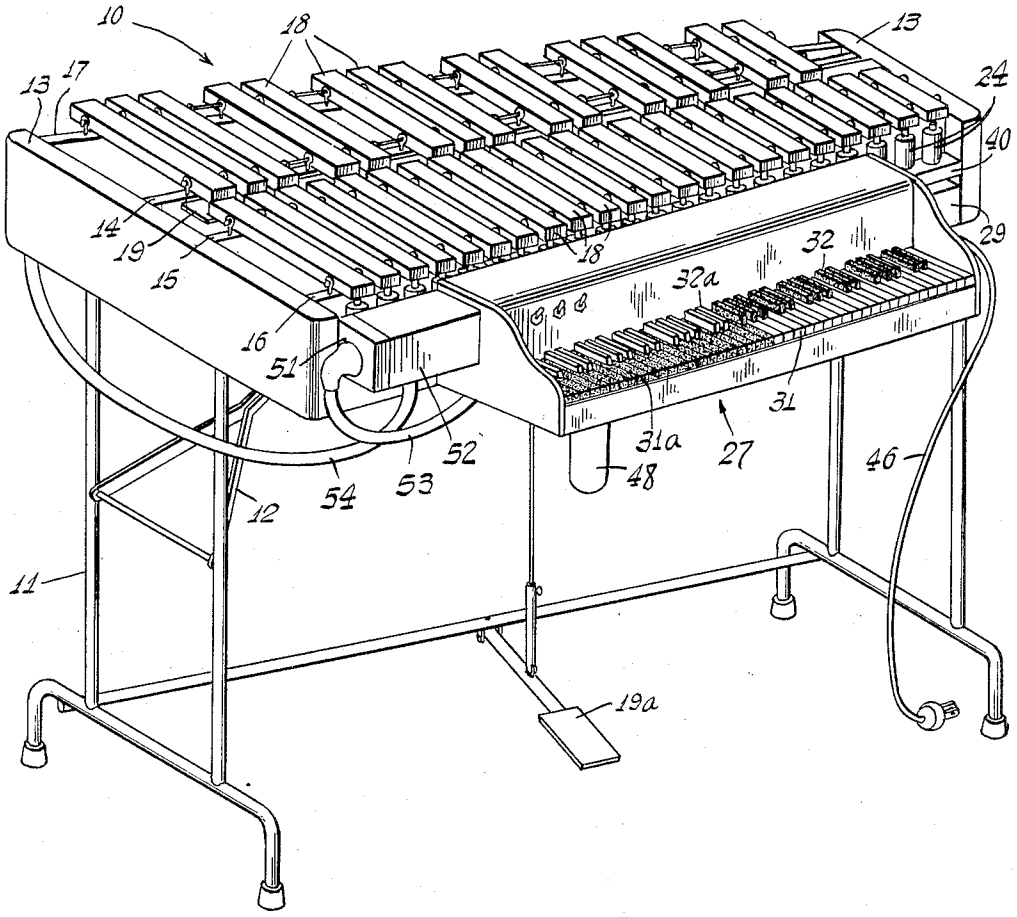
July 29, 1958 E. J. BODA 2,844,986

MEANS FOR PLAYING A PERCUSSION INSTRUMENT OF THE VIBRAPHONE, ETC., TYPE

Filed Aug. 24, 1955 3 Sheets-Sheet 1

Fig. 1



INVENTOR.
Ernest J. Boda

BY

Johnson and Kline

ATTORNEYS

July 29, 1958 E. J. BODA 2,844,986

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Fig. 2

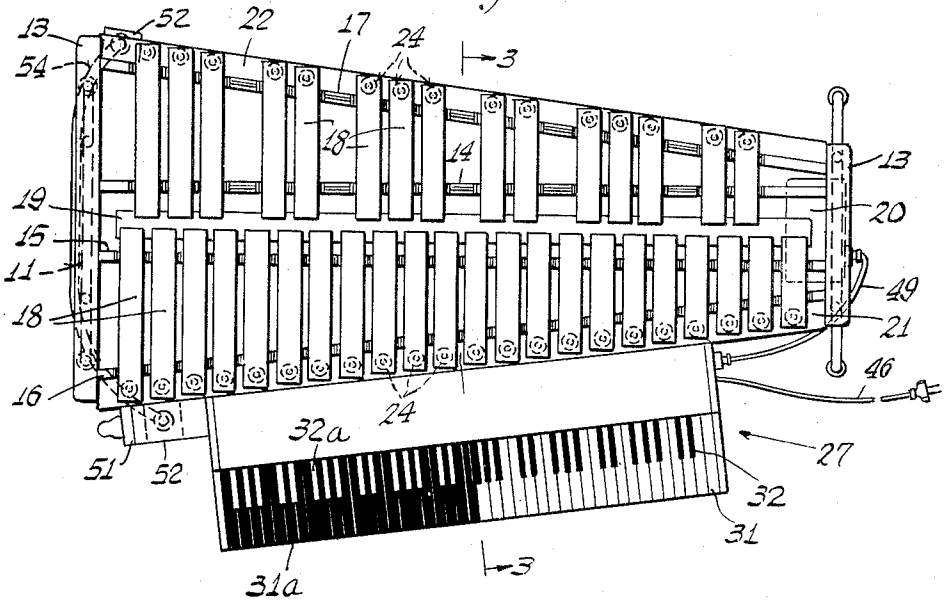


Fig. 3

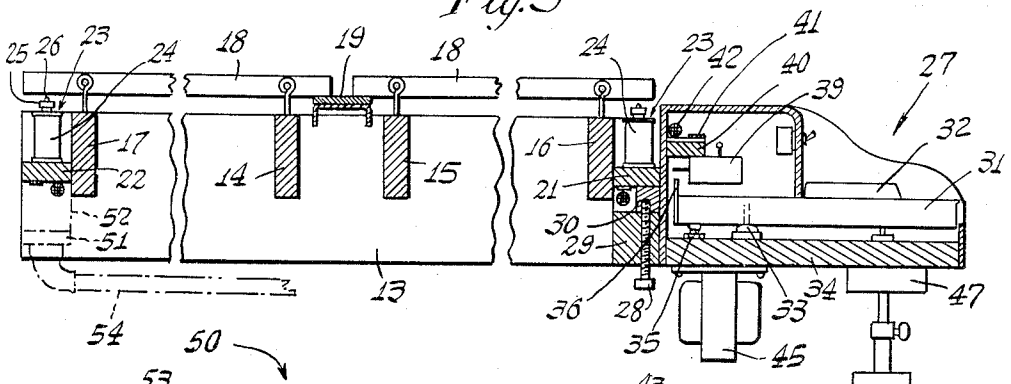


Fig. 4

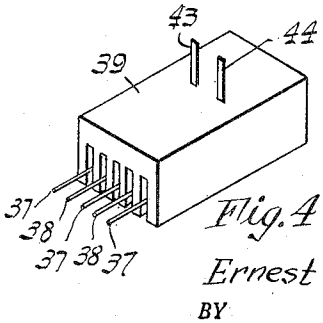
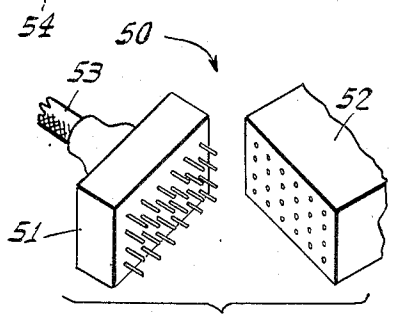


Fig. 5



INVENTOR.
Ernest J. Boda
BY
Johnson and Kline
ATTORNEYS

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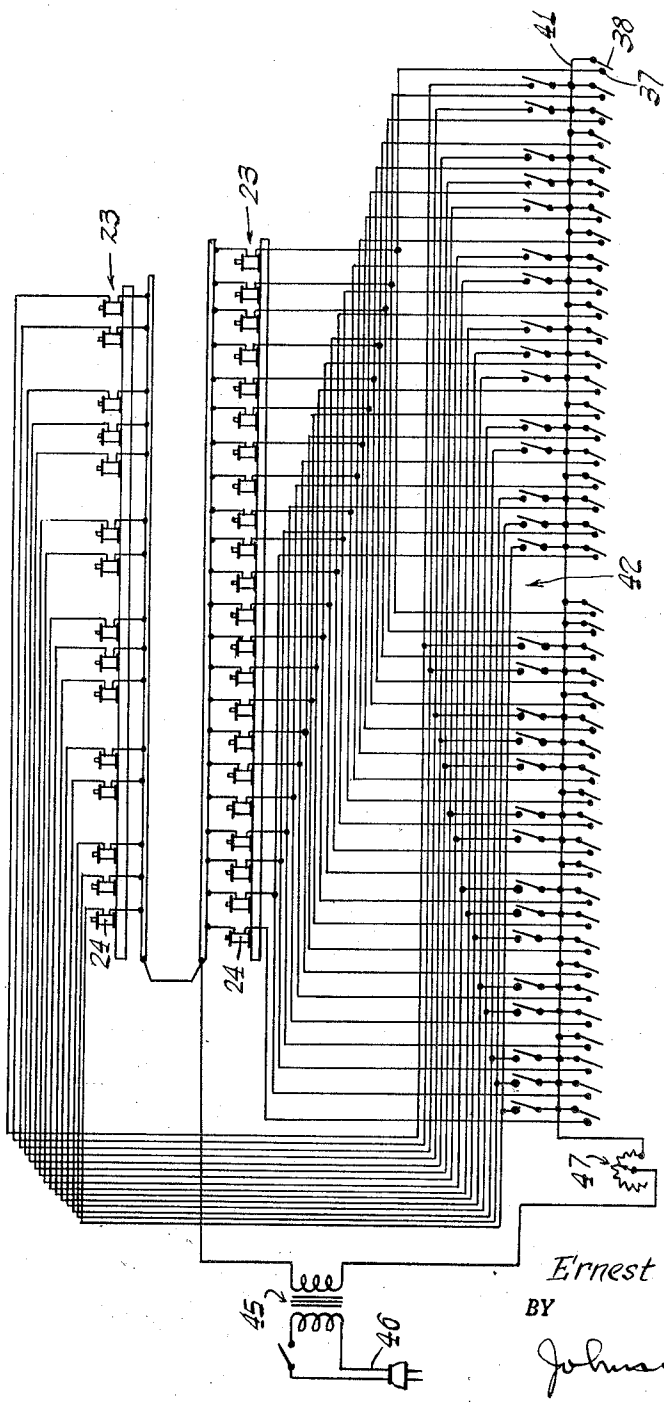


Fig. 6

INVENTOR.
Ernest J. Boda
BY
Johnson and Kline
ATTORNEYS

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MEANS FOR PLAYING A PERCUSSION INSTRUMENT OF THE VIBRAPHONE, ETC., TYPE

Ernest J. Boda, Fairfield, Conn.

Application August 24, 1955, Serial No. 530,256

5 Claims. (Cl. 84—405)

This invention relates to means adapted to be mounted on a percussion instrument such as a standard vibraphone, marimba or the like, whereby the instrument can be played by means of a keyboard or mallets as desired.

In playing vibraphones or the like instruments, great skill is required in the handling of the mallets.

It is an object of the present invention to overcome the disadvantages heretofore encountered in the playing of vibraphones or the like by providing a keyboard means whereby any person familiar with a keyboard instrument, such as a piano, organ or the like can play the vibraphone or the like instrument.

A feature of the invention resides in the fact that the device of the present invention can be built into, or attached to existing instruments to permit them to be played from a keyboard without any substantial altering of the instrument so that it may still be played by mallets, if desired. If additional effects are desired a double keyboard may be employed having each section of the keyboard a distinctive color so that the person playing can readily distinguish the range on the keyboard.

Another feature of the invention resides in the simplicity of the device of the present invention whereby it can be readily attached to, or detached from, an existing standard vibraphone or the like instrument with a minimum of effort.

In carrying out the present invention a plurality of electromagnetic striker members are arranged on elongate supports adapted to be clamped or otherwise secured to each of the side rails of the instrument with the strikers positioned to engage the bars of the instrument. The strikers are connected to the keyboard and, where a double keyboard is used, a single striker is connected to the same key on each of the keyboards so that they can be operated from each keyboard. The striker members are detachably connected by means of a cable harness to the keyboard so that they can be readily separated when it is desired to remove or install the device. If desired, a manually operated rheostat or the like current controller can be incorporated to vary the force with which the striker engages the bar.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the drawings in which:

Figure 1 shows a perspective view of an instrument with the invention applied thereto.

Fig. 2 is a top view of Fig. 1.

Fig. 3 is an enlarged sectional view taken along lines 3—3 of Fig. 2.

Fig. 4 is a detail view of the contact block.

Fig. 5 is a fragmentary view of the releasable connector.

Fig. 6 is a schematic wiring diagram showing the strikers connected to the keys of the double keyboard.

While the present invention may be used in conjunction with various types of percussion instruments which are adapted to be struck by mallets, it is herein illustrated as applied to a vibraphone **10** having end legs **11** upon which the vibraphone is mounted. Preferably, the legs are secured in a supporting position by means of braces **12**. The vibraphone has transverse end members **13** supported by the legs and which are connected by longitudinal rails **14**, **15**, and side rails **16**, **17** which carry the usual tuned bars **18** in a substantially horizontal plane in position to be struck by mallets. A damping bar **19** operated by pedal **19***a* is carried by the vibraphone. The usual resonators for each of the bars and their rotating vanes have been omitted from the drawings for the sake of simplicity and clarity. A motor **20** on one of the end bars is adapted to rotate the vanes to provide the vibrant effect.

In order that the vibraphone may be played by a keyboard as well as mallets, the present invention provides elongate supports **21**, **22** which extend along and are secured to the front and back side rails **16**, **17** and are provided with a plurality of normally retracted, electromagnetically operated strikers **23**, one disposed below each of the tuned bars. Each striker has an energizing coil **24** surrounding a normally retracted striker member **25** having a suitable striking head **26**. The striker member, in retracted position, is spaced from the bar and when the coil is energized the striker is propelled toward the bar by the magnetic force set up by the coil and the striker head engages the tuned bar and causes it to vibrate to produce its predetermined tone.

In accordance with the present invention the strikers are adapted to be actuated from a keyboard **27**. While the keyboard may be separate from the vibraphone, it is at present preferred to mount it on the vibraphone and as illustrated herein the keyboard is secured to the elongate support **21** by means of screws **28** or the like releasable fastening means carried by transverse member **29** extending between the ends **13** and cooperating with a rib **30** on the keyboard.

The keyboard is a standard piano-type keyboard having the white and black keys **31**, **32**, as shown in Figs. 1 and 2. The keys, as shown in Fig. 3, are pivoted at **33** on the baseboard **34** and are adjustably positioned by means of an adjustable stop member **35** carried by the baseboard. The rear end of each of the keys carries a circuit closer **36** adapted to engage the flexible contacts **37**, **38**, as shown in Fig. 4, of the contact block **39**. The contact block is positioned above each key and connected to a support bar **40** which carries a bus bar **41** and also supports the cable **42** for the keyboard **27** by which the keys are connected to the strikers. The connectors **43**, **44** for contacts **37**, **38** on the block are connected respectively to the bus bar and cable so as to control the individual strikers when the key is depressed.

Carried by the keyboard is a transformer **45** which is adapted to be connected to a suitable source of current by lead **46** and supplies the bus bars and cables with power so that when the contacts are closed by the keys a selected circuit will be made to the proper coil connected to the key and cause the striker to be ejected against the undersurface of the tuned bar to set it vibrating to produce the required tone. If desired, a manually operated rheostat or current controller **47** can be included in the transformer circuit so as to regulate the amount of current in the strikers to vary the intensity of the tone. The controller is illustrated as being actuated by a knee-operated lever **48**.

When applied to a vibraphone, the motor unit **20** adapted to rotate the vanes in the resonators can be connected to the keyboard by a suitable connector **49**.

A feature of the invention resides in the fact that the strikers on each side of the device are connected to the keyboard by means of readily releasable multiple con-

nectors **50** such as shown in Fig. 5 having contact blocks **51, 52** connected to the cables **53, 54** so that they can be quickly connected and disconnected as a unit and the cables removed should it be desired.

A further feature of the invention arises from the fact that the keys and strikers are so positioned on the instrument below the plane of the tuned bars so that the instrument may be played with the usual mallets or keyboard as desired.

In the preferred form of the invention the keyboard is a double keyboard, as shown in Figs. 1 and 2 and the strikers are connected to a corresponding key on each keyboard as is illustrated in the diagrammatic wiring diagram of Fig. 6. Thus, it will permit the person playing the device to provide various effects by controlling the strikers from one or both of the keyboards. To aid the performer the two keyboards have the colors of the keys **31***a*, **32***a* reversed with respect to keys **31, 32** so that each keyboard can be readily distinguished.

From the foregoing it will be apparent that the present invention can be applied to an existing instrument or can be built into an instrument as required and will permit the playing of the instrument as a keyboard instrument or by mallets.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. An attachment for a percussion instrument of the type having outer side rails supporting a plurality of tuned bars in a single, substantially horizontal plane comprising a pair of elongate support members extending along said side rails and having electromagnetic strikers thereon disposed below and adapted to strike the underside of the tuned bars, a keyboard mounted on one of said support members, and means including cable means electrically connecting each of the strikers to a key on the keyboard whereby the instrument can be played electrically from the keyboard or by mallets.

2. The invention as defined in claim 1 wherein said cable means includes separable connections between the keyboard and strikers on each support whereby the attachment can be quickly and easily applied and removed from a standard instrument without alteration thereof.

3. The invention as defined in claim 1 wherein said keyboard is a double keyboard and wherein said cable electrically connects each of the strikers to a corresponding key on each of the keyboards.

4. The invention as defined in claim 3 wherein the keys on each keyboard are distinctively colored to be readily distinguished.

5. The invention as defined in claim 1 wherein the means electrically connecting the strikers to the keyboard includes a current varying means whereby the striking force of the magnetic strikers is controlled, thereby controlling the volume of the instrument.

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