Dec. 2, 1969 T. E. SINES 3,482,029

GUITAR WITH REMOTE CONTROL ORGAN PLAYING MEANS

Filed Sept. 9, 1966 2 Sheets-Sheet 1

Fig. 1

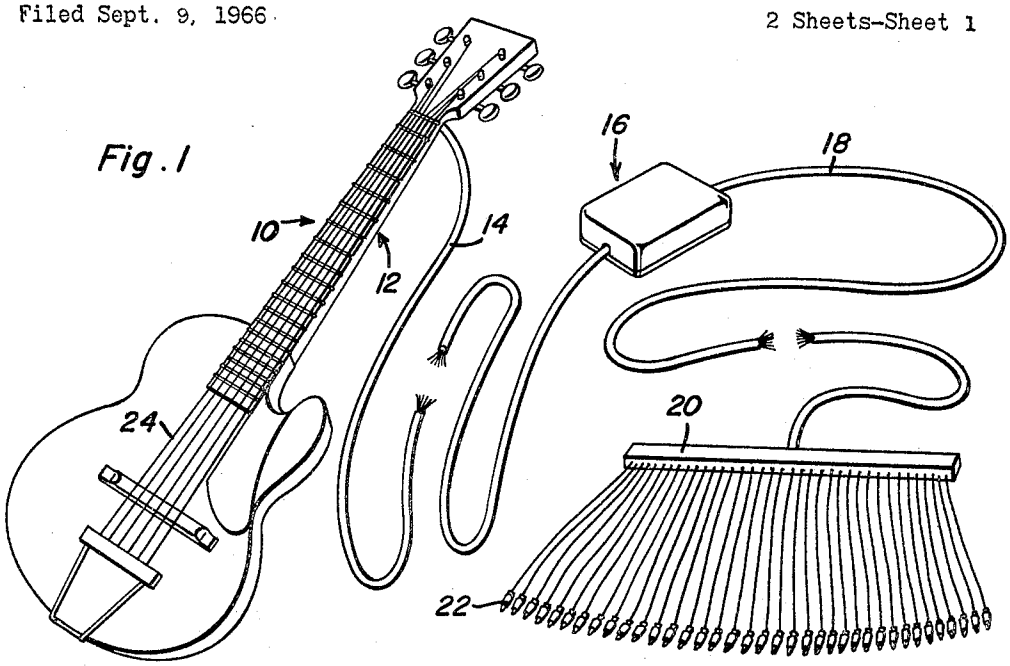


Fig. 2

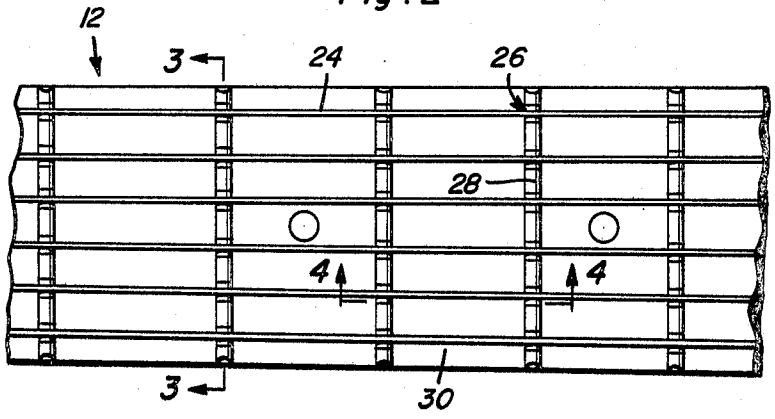


Fig. 3

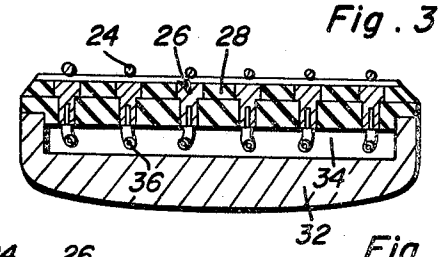
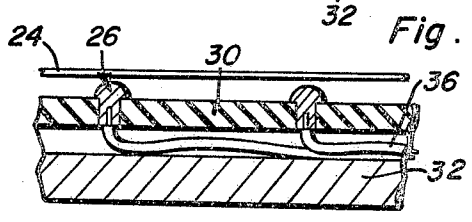


Fig. 4



Thomas E. Sines
INVENTOR.

BY Thomas A. O'Brien and Harvey B. Jackson
Attorneys

Dec. 2, 1969 T. E. SINES 3,482,029

GUITAR WITH REMOTE CONTROL ORGAN PLAYING MEANS

Filed Sept. 9, 1966 2 Sheets-Sheet 2

Fig. 5

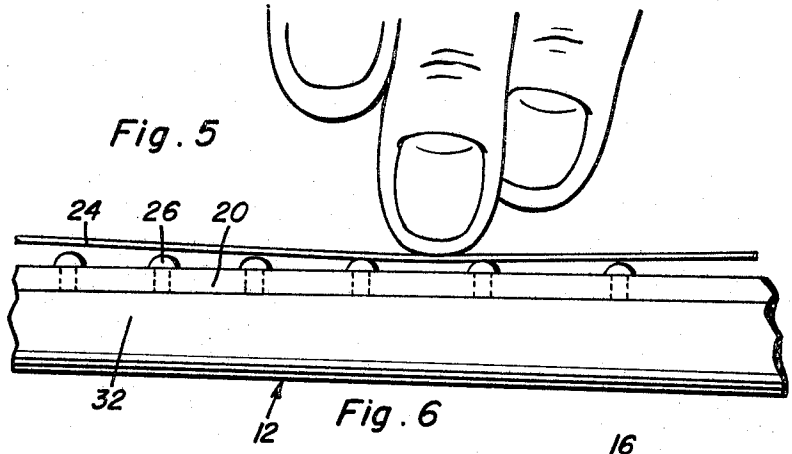


Fig. 6

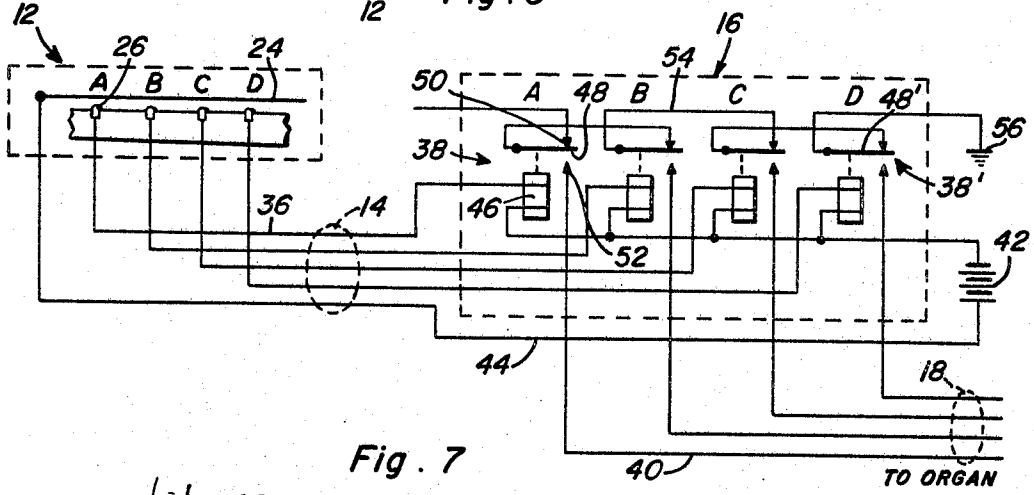
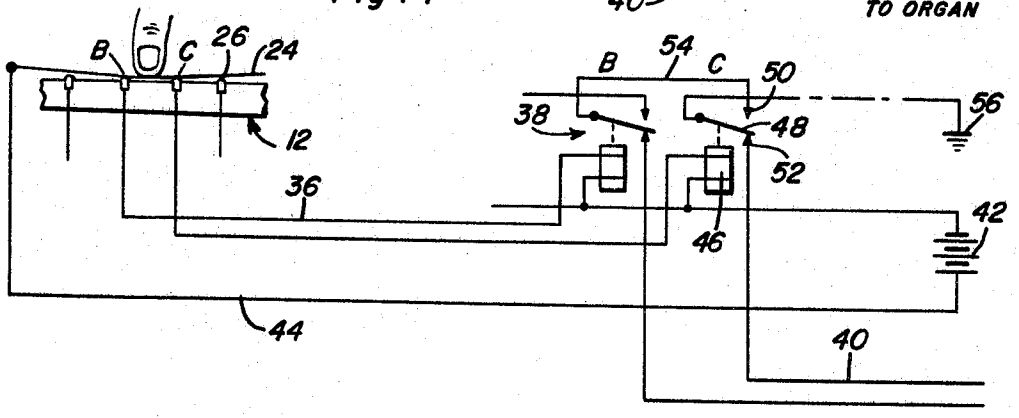


Fig. 7



Thomas E. Sines
INVENTOR.

BY Lawrence O'Brien and Harvey B. Jackson
Attorneys

United States Patent Office 3,482,029 Patented Dec. 2, 1969

3,482,029

GUITAR WITH REMOTE CONTROL ORGAN PLAYING MEANS

Thomas E. Sines, Sacramento, Calif., assignor of ten percent to Marvin E. Pope, Sacramento, Calif.

Filed Sept. 9, 1966, Ser. No. 578,312
Int. Cl. G10h 3/00, 1/00
U.S. Cl. 84—1.16 3 Claims

ABSTRACT OF THE DISCLOSURE

The frets on the fingerboard of a guitar are wired through a relay circuit to a tone generator to produce output tones when the frets are engaged by electrically conductive strings. The frets are associated with relay coils in the relay circuit having series connected relay switches through which operation of the tone generator is limited to generation of a single tone at a time even though more than one fret is engaged.

This invention relates to fingerboard controls for musical tone generators and constitutes an improvement over my prior copending application U.S. Ser. No. 457,657, filed May 21, 1965.

A primary object of the present invention is to provide an arrangement for controlling operation of a tone generator from the fingerboard of a guitar wherein more than one output tone at a time from the generator is prevented.

The improvement of the present invention features a relay operated switch assembly through which selected tone producing circuits are completed when one or more frets on a fingerboard are engaged by the fingerboard strings. The strings are accordingly connected to a source of voltage associated with the relay coils of the relay operated switch assembly so as to establish a ground connection through the relay operated switch assembly to the selected tone producing circuits. The switch sections of the relay operated switch assembly are however interconnected in such a manner that only one tone producing circuit wil be completed even though two or more switch devices are simultaneously actuated by energization of the corresponding relay coils when two or more of the frets are engaged.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed; reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the apparatus associated with the present invention.

FIGURE 2 is a top plan view of a portion of the fingerboard of the guitar shown in FIGURE 1.

FIGURE 3 is a transverse sectional view taken substantially through a plane indicated by section line 3—3 in FIGURE 2.

FIGURE 4 is a partial sectional view taken substantially through a plane indicated by section line 4—4 in FIGURE 2.

FIGURE 5 is an enlarged side elevational view of a portion of the fingerboard being manipulated by the player.

FIGURE 6 is an electrical circuit diagram showing the system of the present invention in an inactive condition.

FIGURE 7 is an electrical circuit diagram of the control system in an active condition.

Referring now to the drawings in detail, it will be observed from FIGURE 1 that the system of the present invention may involve a stringed instrument such as the guitar **10** having a fingerboard **12** electrically connected by

a multiconductor, electrical conduit **14** to a relay operated switch assembly **16**. The relay operated switch assembly is in turn electrically connected to a tone generator (not shown) through a multiconductor cable **18**, a terminal strip **20** and a plurality of terminal elements **22** as described in the aforementioned prior copending application. It will become apparent therefore, that the guitar player may depress one of the strings **24** at a selected location along the fingerboard **12** resulting in the completion of an energizing circuit in the tone generator to produce a corresponding musical tone.

As shown in FIGURES 2, 3 and 4, each of the strings **24** overlies longitudinally aligned frets **26**. The frets are also laterally aligned and spaced from each other by nonconductive spacing ribs **28** received within slots formed in the top fingerboard panel **30**. The fingerboard panel is mounted on a nonconductive base **32** forming an internal chamber **34** through which a plurality of conductors **36** extend. Each of the conductors is electrically connected to one of the frets which is made of an electrically conductive material so as to form a contact engageable by one of the strings **24**. The conductors **36** extend out of the fingerboard and are sheathed within the multiconductor conduit **14** aforementioned for electrical connection to the relay operated switch assembly **16**.

Referring now to FIGURE 6, it will be observed that each of the frets **26** is connected by one of the conductors **36** to one of a plurality of switch devices **38** located within the assembly **16**, each switch device being electrically connected by one of a plurality of conductors **40** to the tone generator, the conductors **40** being sheathed within the multiconductor cable **18**. Also associated with the assembly **16**, is a source of voltage such as the battery **42**. One terminal of the battery is connected through a conductor **44** to the strings **24** so as to actuate one or more of the switch devices **38** when its associated fret is engaged by a string. Accordingly, the relay coil **46** in each of the switch devices is connected in parallel to the other terminal of the battery **42** for energization thereof when a corresponding fret is engaged by a string. The relay coils are therefore connected to the corresponding frets by the conductors **36** aforementioned. Also, associated with each switch device is a relay operated, two position switch **48** normally engaged with a contact **50** when the relay coil **46** is deenergized. The normally opened contacts **52** associated with the switches **48** on the other hand, are connected by the conductors **40** to the tone generator. The switch arms of successive switches **48** are also electrically connected through conductors **54** to the normally engaged contacts **50** of the following switch devices, the last switch device being connected directly to ground **56**. It will be apparent therefore, that when all of the relay coils **46** are deenergized, all of the switch devices will be interconnected in series to ground **56**.

FIGURE 6 illustrates by way of example, four of the switch devices **38** respectively identified as A, B, C and D electrically connected to their corresponding frets **26** also identified as A, B, C and D. When two of the frets are engaged by a string as shown in FIGURE 5, energizing circuits are completed for the corresponding relay coils **46** so as to displace the associated switch arms **48** into engagement with the contacts **52** as shown in FIGURE 7. It will be observed, however, that only the actuated switch device C closest to ground **56** will establish a ground connection to one of the conductors **40** in order to complete an energizing circuit in the tone generator. Because the switch arm **48** of switch device C no longer engages its contact **50**, the series connecting conductor **54** is no longer operative to apply ground to the switch B so that even though the switch arm engages contact **52** no ground is applied to the conductor associated with the switch device B. It will be appreciated therefore, that only one

of the tone producing circuits will be completed despite the fact that two or more frets are engaged by a string. In any case, only the actuated switch device closest to ground will be operative to complete an energizing circuit in the tone generator.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a musical fingerboard having a plurality of longitudinally spaced frets mounted thereon, at least one string adapted to be depressed at selected locations engaging selected frets and a tone generator adapted to emit a plurality of different tones, electrical means connecting said fingerboard to the tone generator for producing said different tones comprising, a plurality of switch devices corresponding respectively to said frets, a plurality of conductors electrically connecting said switch devices to the tone generator for completing selected circuits producing said tones in response to engagement of said frets, and means electrically interconnecting said switch devices to prevent establishment of more than one of the energizing circuits at a time, each of said switch devices including a two position switch and a relay coil energized to displace said switch from one position to the other, a source of voltage connected to said relay coils, and circuit means respectively connecting said relay coils to the frets for energization thereof in response to engagement of the frets by the string, said circuit means comprising means connecting said string to the voltage source and a plurality of lines respectively connecting the frets to the relay coils, said frets being made of electrically conductive material to form a contact engageable by the string, said electrical interconnecting means comprising grounding means connecting said switches in series with ground when all are in said one

position with the relay coils deenergized, said switches in the other position thereof being electrically connected to said plurality of conductors.

2. In combination with a musical fingerboard having a plurality of longitudinally spaced frets mounted thereon, at least one string adapted to be depressed at selected locations engaging selected frets and a tone generator adapted to emit a plurality of different tones, electrical means connecting said fingerboard to the tone generator for producing said different tones comprising, a plurality of switch devices corresponding respectively to said frets, a plurality of conductors electrically connecting said switch devices to the tone generator for completing selected circuits producing said tones in response to engagement of said frets, and means electrically interconnecting said switch devices to prevent establishment of more than one of the energizing circuits at a time, said electrical interconnecting means comprising, grounding means connected to one of said switch devices, and series wiring means connecting the other switch devices to ground in series with said one of the switch devices.

3. The combination of claim 2 wherein each of said switch devices includes a two position switch and a relay coil energized to displace said switch from one position to the other, a source of voltage connected to said relay coils, and circuit means respectively connecting said relay coils to the frets for energization thereof in response to engagement of the frets by the string.

References Cited

UNITED STATES PATENTS

3,217,079	11/1965	Murrell	84—1.16
3,388,206	6/1968	Sines	84—1.16

HERMAN KARL SAALBACH, Primary Examiner

F. P. BUTLER, Assistant Examiner

U.S. Cl. X.R.

84—1.01