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Robinson

[11] **3,834,266**

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[54] **CARTRIDGE STRING GUITAR ASSEMBLY**

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[52] **U.S. Cl.** **84/267,** 84/293, 84/297

[51] **Int. Cl.** **G10d 1/08**

[58] **Field of Search** 84/267, 293, 297, 268, 84/269

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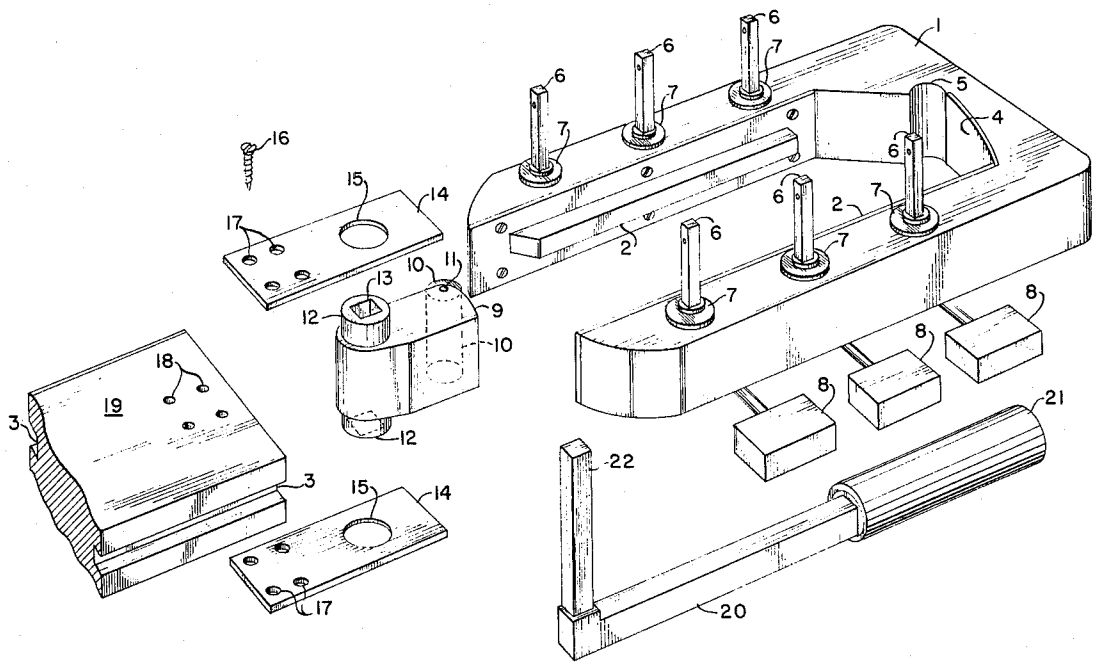
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Primary Examiner—Richard B. Wilkinson
Assistant Examiner—John F. Gonzales

[57] **ABSTRACT**

A cartridge string guitar assembly having a key head slidably mounted in a slideway upon a neck shank operatively movable by a cam and lever mechanism. Six square-headed key posts are revolvably mounted on the key head and connected to gear-driven tuning handles. A cartridge string housing comprising all six guitar strings as a unit and a rear bracket containing the opposite ends of the strings is inserted onto the guitar by means of six cartridge spools within the housing and each having a square hole provided vertically through its center which interlocks with its respective square-headed key post. Each of the spools has a guitar string wrapped around its cylindrical body for individually tuning same. A lever is then inserted into the pivot shaft of the cam, the shaft having a square socket vertically through its axis for turning the cam from inoperative to operative position thereby forcing the key head outward on its slideway creating a miminum amount of tension on the strings. The opposite ends of the strings are contained in a detachable bracket which is designed to be either injected into a groove of a bridge or extracted from the same in a simple operation. The strings are subsequently tuned in the usual manner.

6 Claims, 7 Drawing Figures



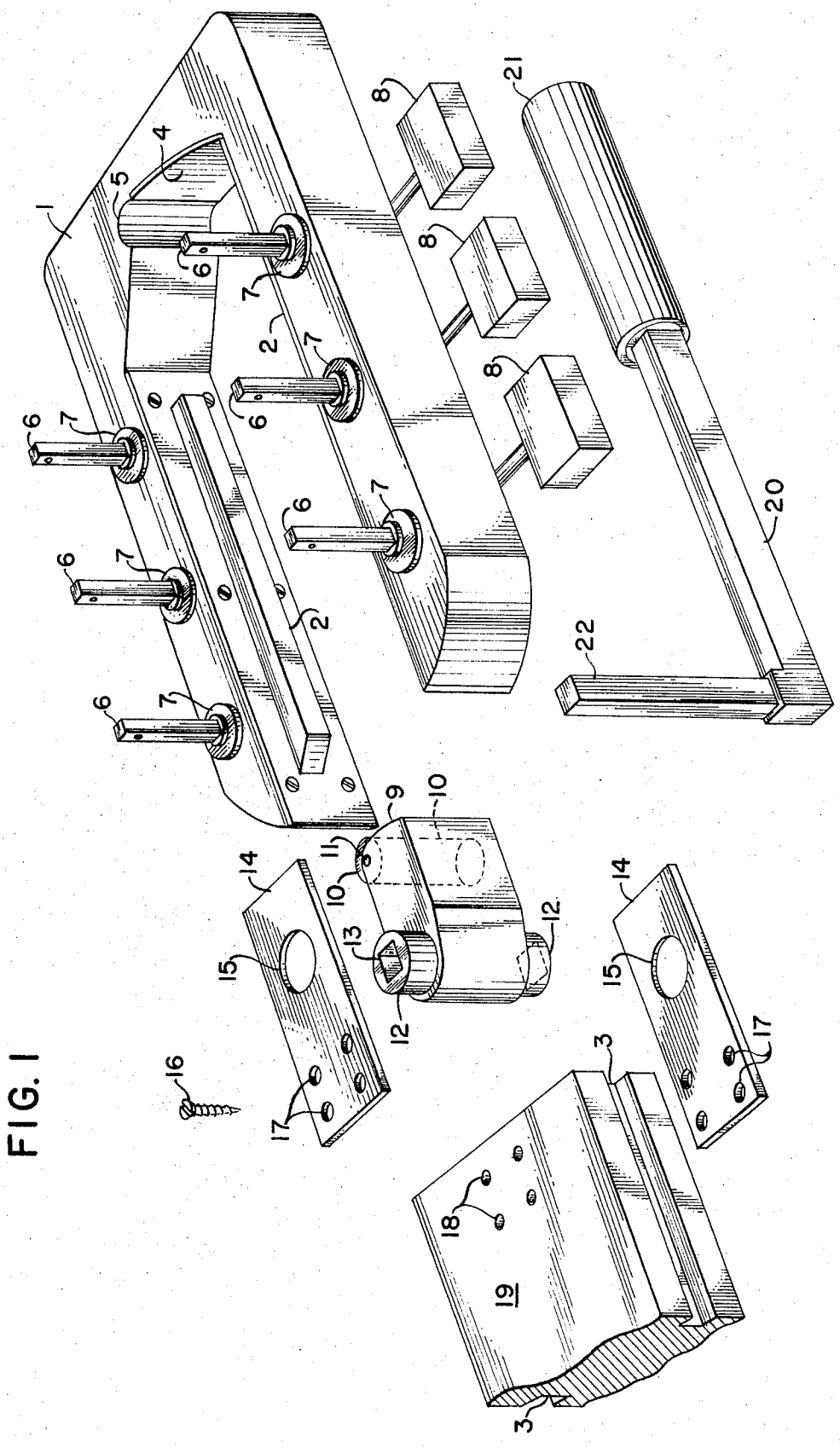


FIG. 1

FIG. 2

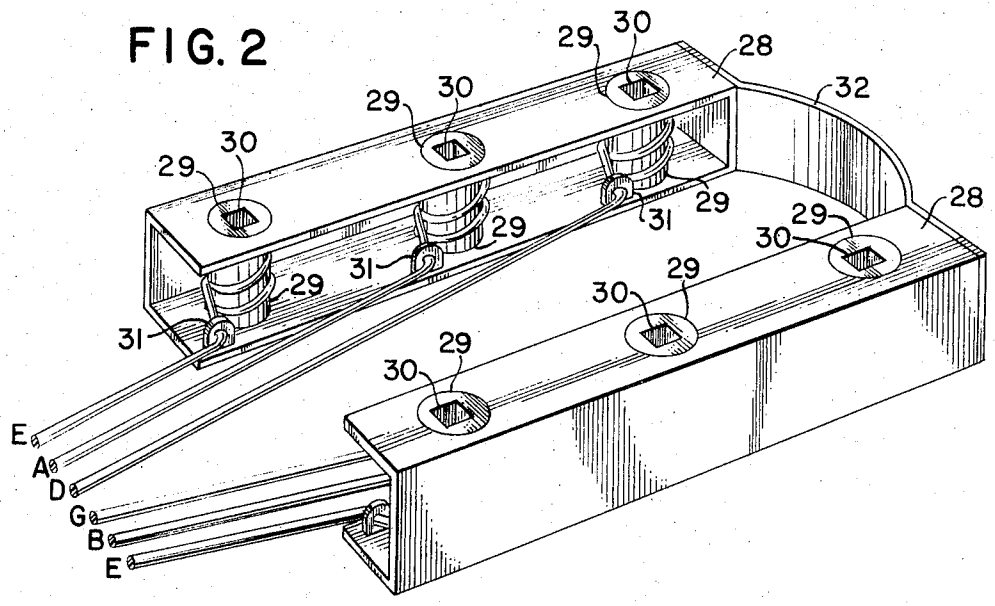
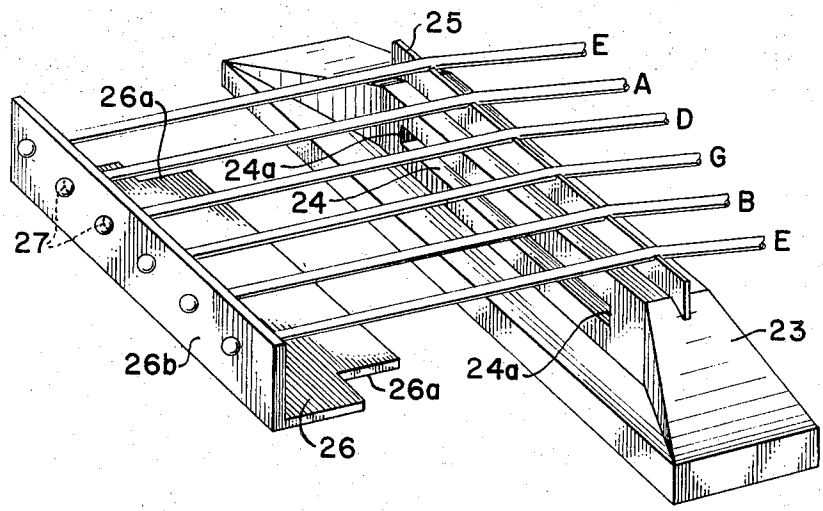


FIG. 3



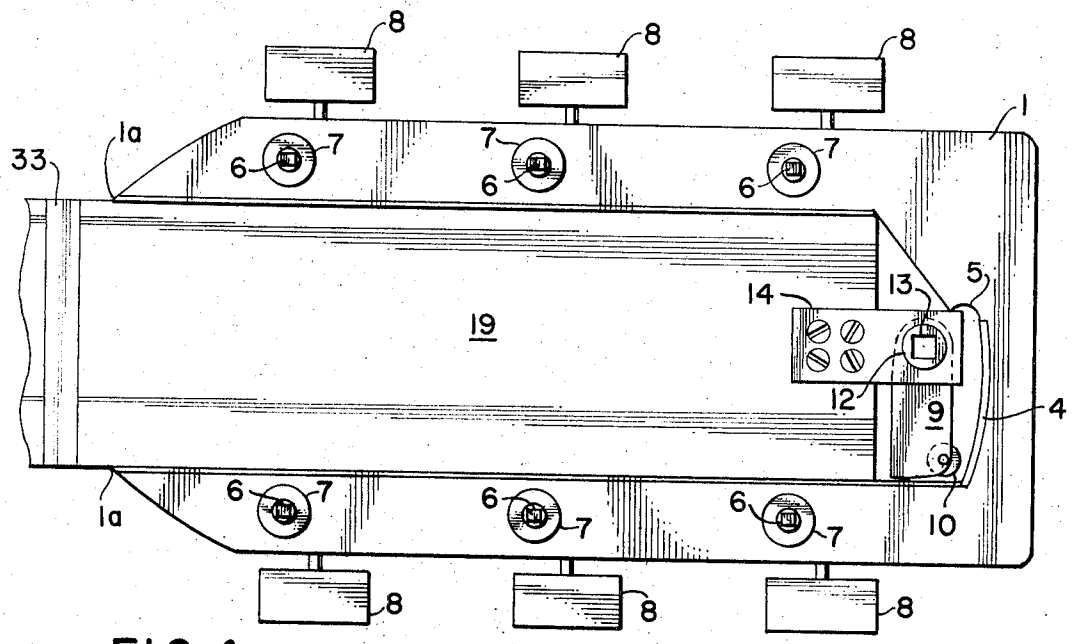

8
8
8
1
1a
33
6
7
19
14
13
5
12
9
4
10
1a

FIG. 4

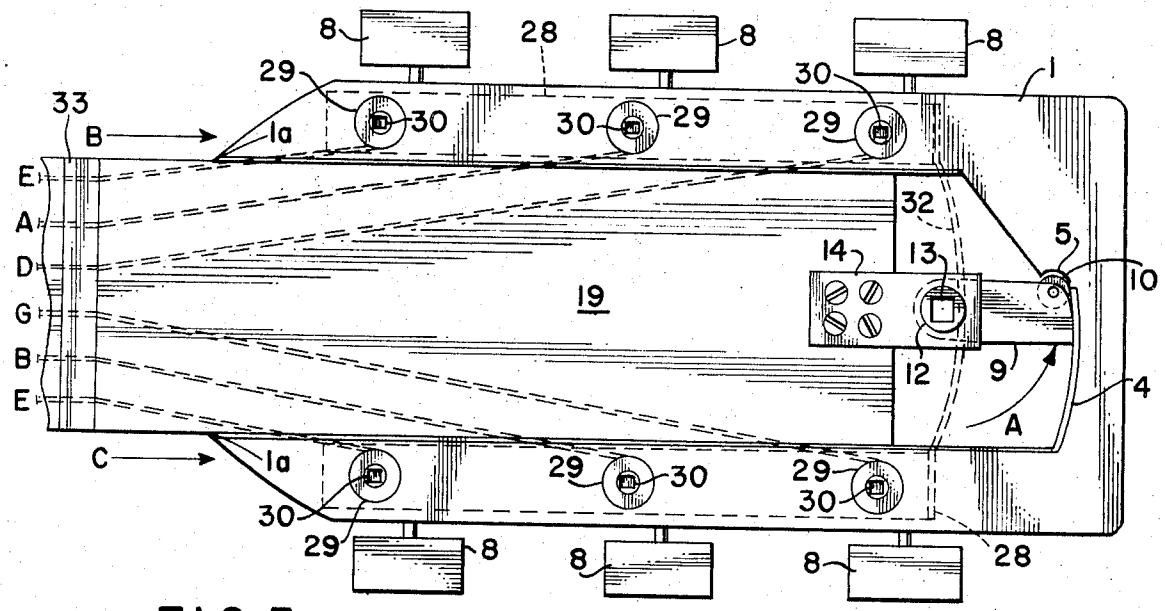

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28

FIG. 5

FIG. 6

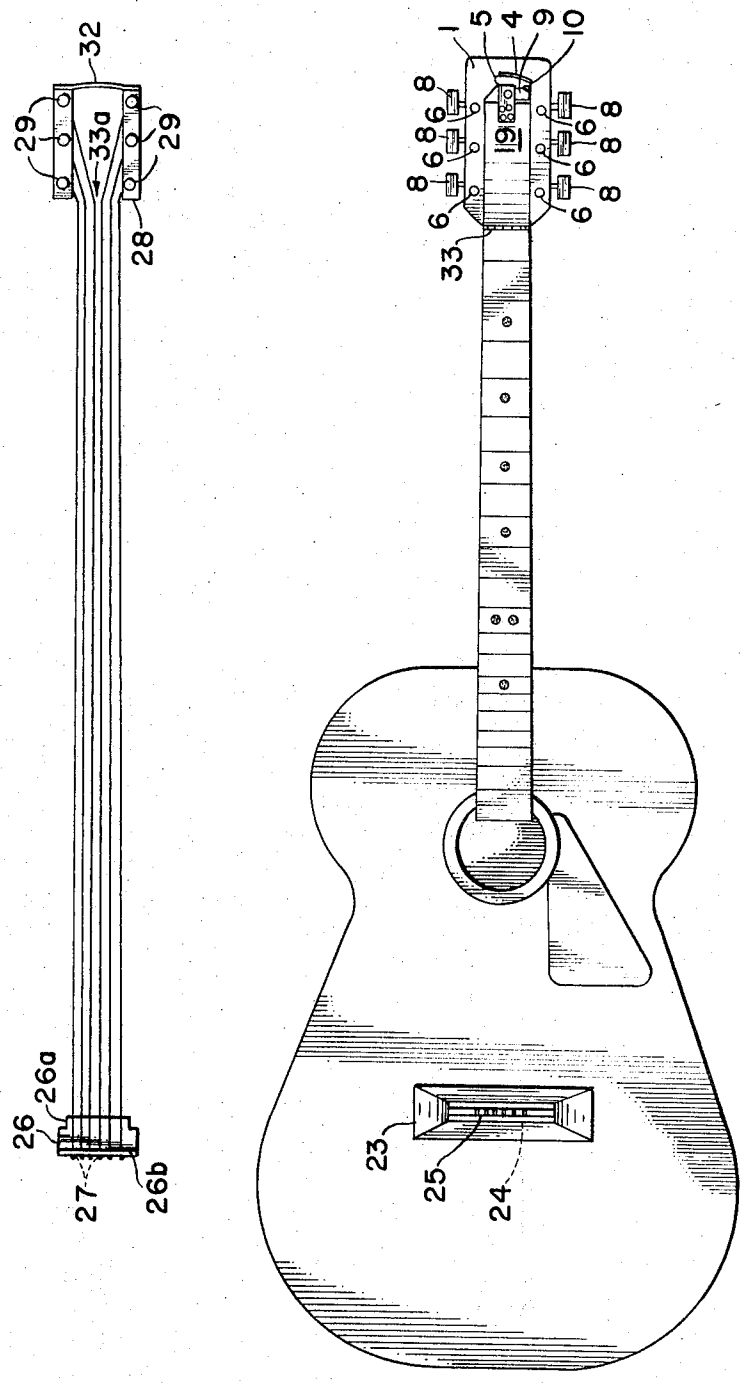
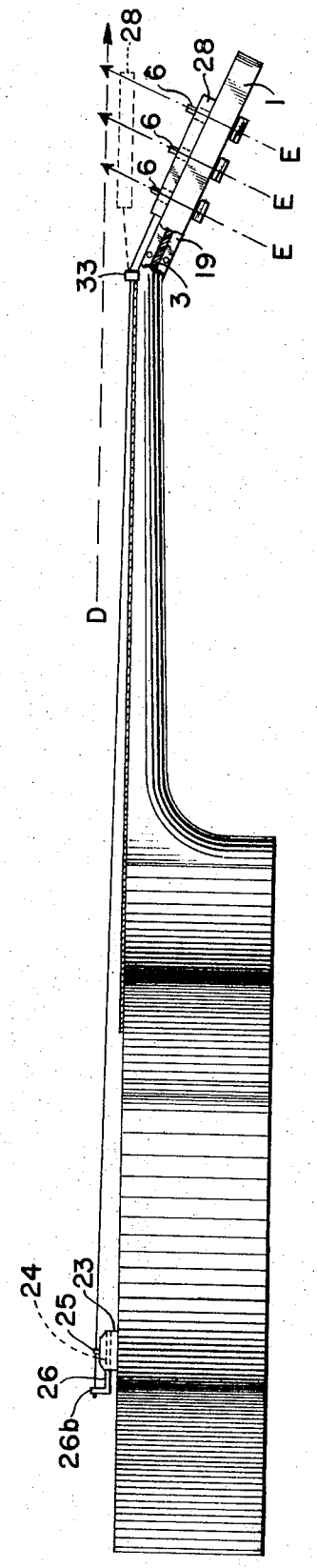


FIG. 7



CARTRIDGE STRING GUITAR ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a cartridge string guitar assembly and more particularly to a structure which enables a key head to be slidably mounted on the neck of the guitar and operatively movable by a cam and lever mechanism. All six of the guitar strings are contained in a detachable housing and rear bracket which enables a guitarist to either install or remove a complete set of strings more easily and in less time.

2. Description of the Prior Art

Most known guitars, or all of which I am aware, generally consist of devices for either installing or removing each string in a singular fashion by means of a peg-and-hole assembly. This tedious procedure requires a guitarist to unwind each string from its key post individually and slowly. The peg must then be lifted from its hole in the bridge before the used string can be extracted. When replacing a new string, the same tedious procedure is reversed.

There has been basically little improvements and changes advantageously associated to the guitars throughout the years.

Guitarists have been using this conventionally outdated method to the best of their ability primarily because it is the only kind available to them.

The trend today in music is rapidly changing, and the long grueling "raod trips" day after day and steady concerts played in ever increasing demand only add to a musician's hardships. And since most guitarists prefer to change strings periodically, the conventional guitar and its primitive method is of no great comfort and above all no convenience to his struggling career.

SUMMARY OF THE INVENTION

Objectives of the invention include providing a cartridge housing assembly containing all six guitar strings complied in the unit to be installed onto or removed from the guitar in a fraction of time normally required. The general components of a sliding key head having six square key posts revolvably secured thereon enable the cartridge housing comprising six string spools to interlock rapidly with the key posts or to be releasably disengaged as well, the string spools having each a square vertical socket procured therethrough, thereby corresponding with the square key posts.

Another object of my invention is to provide a cam pivotally located at the front edge of the guitar neck shank and between the key head in order to provide a pivoting factor when a lever is inserted into the square socket of the shaft of the cam and actuated manually. This action forces the sliding key head outwardly forward on the slideway creating a minimum of tension on the guitar strings, whereby the strings are then tuned to proper pitch.

A further object of this invention is in connection relative to the previous objective. Whenever the cam is released manually, the sliding key head will retract to its at rest position thereby relieving the tension of the strings allowing the spent cartridge to be removed easily. It is common knowledge among guitarists that a guitar string once stretched to its normal pitch will never return to its exact length. Therefore, the key head having the ability to be released quickly, allows the cartridge of strings to be removed easily without having to turn down the tension of each individual string manually.

Still another object of this invention is having a bracket containing the opposite ends of the guitar strings in a unit, the bracket releasably fitting into a horizontal groove of a bridge in one operation.

Only the primary objectives are listed above but other features and advantges will become more readily apparent from the following description and the accompanying drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the sliding key head disassembled to show the relationship of the various moving parts;

FIG. **2** is a perspective view of the cartridge housing showing how the strings are contained;

FIG. **3** is a perspective view of the rear bracket assembly along with the bridge illustrating the relationship between the two;

FIG. **4** is a top plan view of the sliding key head in its at rest position ready to receive the cartridge;

FIG. **5** is a top plan view similar to FIG. **4** but showing the cartridge housing after installation and the different angle of the cam;

FIG. **6** is a top plan view of the complete improved guitar assembly along with the cartridge string housing and rear bracket;

FIG. **7** is a side elevational view of the guitar illustrating the extreme angle of the key head which serves to lock the cartridge in place.

Similar numerals refer to similar parts throughout the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While one embodiment of my invention is illustrated in the above referred to drawings, it is to be understood that they are merely for the purpose of illustration and that various changes in construction may be resorted to in the course of manufacture in order that the invention may be utilized to the best advantage according to circumstances which may arise, without departing from the spirit of my invention, which is to be limited only in accordance with the appended claims.

The improved cartridge string guitar assembly is generally indicated at key head **1** (FIG. **1**) and is shown disassembled in order to establish more clearly the mode of assembly and the relative components. The improved assembly generally employs the conventional electric or nonelectric guitar body but with advanced changes in the construction of the key head, bridge and installation of the strings. Therefore, only the improved portions will be described in detail since the conventional guitar is such a well known instrument.

Key head **1**, preferrably constructed in a U-shaped manner, has a horizontal barlike slider **2** securely attached by a plurality of countersunk screws to each of the two inner sides thereon. A companion slideway **3** is horizontally mounted on each of the two outer sides of a neck shank **19** thereby providing a sliding track for key head **1** when the slideway assembly is integrated.

Key posts **6**, six in number and each having a square upstanding post, are revolvably contained in respective pivot casings **7** spaced accordingly on key head **1** and

connected to gear-driven tuning handles **8** in the usual way. Key posts **6** may each be provided with a horizontal eyelet hole near the upper portion thereof receiving individually a guitar string therein.

A cam **9** is pivotally mounted in a pair of base supports **14** upon neck shank **19** by its shaft **12** protruding from the upper and bottom sides of its pivotal end which extend into holes **15** of base supports **14.** Base supports **14** are unattachably mounted by the combination of holes **17** and screws **16** which when integrated with their counterpart holes **18** upon the front portion of neck shank **19** constitutes a rigid support for cam **9.**

A square drive socket **13** extends vertically through the axis of shaft **12** relative to a square-headed drive **22** of lever assembly **20** comprising a torque handle **21** for turning cam **9** from inoperative to operative position. A roller bearing **10** is vertically revolvably mounted on pin **11** at the upper apex corner of cam **9** thereby allowing the cam to roll freely on a follower lining **4,** the latter unattachably connected to the inner front surface of key head **1** and rounded in contour to allow a gradual increase when a turning motion is applied. This action of turning cam **9** against follower lining **4** projects key head **1** outwardly forward on slideway **3** and slider **2.**

A locking slot **5** is provided at the upper end of the follower lining **4** into which roller bearing **10** rests when in a forward position. Slot **5** prevents key head **1** from retracting to its at rest position by holding cam **9** in a locked position. Cam **9** must be actuated manually before key head **1** can be released from its forward position.

Cam **9** is shown in a forward position in the respective drawings; however, the cam can be seen in its at rest position in FIGS. **4** and **6.**

Cartridge string housing assembly **28** (FIG. **2**), preferrably a pair of slender channel-shaped sections, are linked together by a flexible connecter **32** which interlocks housings **28** in parallel unison. Therefore, the pair of housings will subsequently be referred to as singular.

Housing **28,** preferrably of molded plastic or nylon, contains six cartridge spools **29,** three in number on each of the two sections, revolvably inserted in respective holes in an upright position. Each of spools **29** contains the front portion of a guitar string wrapped around its cylindrical body for the purpose of tuning its respective string individually. A square socket **30** extends vertically through the axis of each spool **29** to be releasably connected over the corresponding square-headed key posts **6** as shown in FIG. **1.**

Sockets **30** could be any shape other than round; but whichever shape is selected, they must correspond with the shape of key posts **6.**

Spools **29** each contains an eyelet for locking the tip of a guitar string therein thereby preventing the string from slipping when tension is applied as in manual tuning.

String guides **31,** six in number, are provided at the inner bottom portion of housing **28** each of which spaced accordingly near its respective spool **29.** Guides **31** each has an eyelet through which a guitar string enters which prevents the string fron unraveling on its corresponding spool **29.** Guides **31** are functional in their purpose only when housing **28** is not in use on the guitar.

Rear bracket assembly **26** (FIG. **3**), preferrably of any heavy-duty alloy, contains the tail portions of the guitar strings E, B, G, D, A and E respectively in holes **27** provided at **26***b*. Bracket front has its corners recessed at **26***a* to form a central tongue-like portion which extends into a horizontal groove **24** of a bridge **23.** The tongue-like portion **26***a* extends only far enough into groove **24** until its wider portion abuts with groove corners **24***a*. Groove **24** is deeply recessed into bridge **23** as shown in FIG. **7,** thereby allowing bracket **26** to be installed quickly as well as removed.

Metal pins may be provided vertically through the desirable portions of bridge **23** which interlock to the guitar body for reinforcing purposes due to the tremendous tension when the strings are tuned to pitch.

Bridge **23** contains the usual nut **25** comprising notches into which the guitar strings rest.

In accordance with the invention, FIG. **4** illustrates the sliding key head **1** in its at rest position ready to receive cartridge housing **28.** Cam **9** is presently at right angle to the line of direction of neck shank **19.** Roller bearing **10** is abutted with follower lining **4,** and the forklike points **1**a are now close to fingerboard nut **33.**

The method of installing cartridge housing **28** is shown diagrammatically in FIG. **5.**

Housing **28** (broken lines) is pressed onto key head **1,** the aforementioned square key posts **6** (FIGS. **1** and **4**) interlocking with the square sockets **30** of spools **29** within housing **28.** The integration of both the square key posts **6** and square sockets **30** enables spools **29** to revolve correspondingly when tuning handles **8** are manally operated, thereby allowing the guitar strings to be tightened individually as in tuning.

In a simulative gesture, cam **9** has been turned in a counterclockwise motion (indicated by arrow A) which forced key head **1** to its forward projection on the slideway assembly (as shown in FIG. **1**). The forklike points **1***a* are now a considerable distance from fingerboard nut **33** (indicated by arrows B and C) as opposed to same in FIG. **4.**

Roller bearing **10** is presently seated in locking slot **5** which stabilizes both cam **9** and key head **1** in a forward position until manually released. Cam **9** can be turned only until it abuts slot **5** of which roller bearing **10** settles therein. A minimum of tension has presently been applied to the guitar strings E, B, G, D, A and E which are now ready to be tuned to their normal pitch by tuning handles **8.**

The aforementioned lever drive **22** (FIG. **1**) engages with sqaure socket **13** which operatively turns shaft **12** and cam **9** simultaneously. Roller bearing **10** permits cam **9** to be turned somewhat easier by revolving on follower lining **4.**

In the aforementioned counterclockwise motion of cam **9,** it should be understood that the cam would normally be turned in a clockwise direction in actual practice with respect to a guitarist holding the instrument in a normal working condition and by inserting the lever from the backside of the key head. It is shown in the drawings as being a counterclockwise motion simply because there is no bottom view included. It is felt that such a view is unnecessary.

The complete improved guitar assembly along with the cartridge housing is shown in FIG. **6.** The vertical and horizontal angles of parts depicted previously and subsequently in the specification are in respect to the

position of the guitar as shown in the respective drawing as if the instrument were lying on an ordinary table with its string side upward.

Housing **28** contains the complete set of strings in one compact unit, each of which is convolved on its respective cartridge spool **29** revolvably independently of one another. The opposite ends of the strings are connected to bracket **26** through horizontally aligned holes **27** therein, and key head **1** is shown in its at rest position ready to receive housing **28.**

To summarize the installation procedures, the tongue-like portion **26**a releasably engages groove **24** of bridge **23.** The guitar strings fit into counterpart notches in bridge nut **25.** Housing **28** is therefore pressed over key head **1,** square key posts **6** interlocking with the square sockets **30** of spools **29.** Lever drive **22** (FIG. **1**) is inserted into the square socket **13** and turned, forcing key head **1** outwardly forward on the slideway mechanism. The strings are lined up in their respective notches of fingerboard nut **33.** Roller bearing **10** operatively revolves on follower lining **4** subsequently coming to rest in slot **5,** thereby stabilizing key head **1** in a forward position.

The angle of the guitar strings at **33***a* indicates the angle in which they would have after having been lined up with nut **33.** Therefore, in this position, the strings are ready to be tuned to their normal pitch by handles **8.**

To remove a spent cartridge, the procedures outlined above are reversed. Enough laxity in the strings will prevail when cam **9** is released to enable housing **28** to be lifted off key head **1** due to the fact that guitar strings will never return to their original length once having been stretched in normal tuning.

Neck shank **19** comprises an extreme angle as opposed to the same in conventional guitars for steadfastly locking housing **28** onto the square key posts **6** of key head **1** as shown diagrammatically in FIG. **7.**

The extreme angle of neck shank **19** of the improved guitar is illustrative by comparison to arrow D. Neck shank **19** is constructed obliquely downwardly from arrow D which in turn projects key posts **6** (indicated by arrows E, E, E) in an outwardly direction.

Housing **28** (solid lines) will not slide off key posts **6** until the aforementioned cam **9** (FIGS. **1, 4, 5** and **6**) is turned manually to its at rest position thereby allowing key head **1** to retract on the aforementioned slideway **3** (as shown in FIG. **1**).

Housing **28** (broken lines) illustrates that disengagement from key posts **6** would not be feasible when the strings are tightly tuned, due to both tension of the strings and the extreme angle of key posts **6** extending obliquely upwardly from the direction of arrow D.

IN GENERAL

In the embodiment of the improved invention illustrated in the drawings and described above, the cartridge string guitar assembly permits a guitarist to remove a worn set of strings in less time than before; and in which enables a guitarist to intall a new set of strings just as quickly.

A guitarist may also, after familiarizing himself with the cartridge string principles, add a new single string to the remaining old strings by simply removing the broken fragments (if the string is broken) and inserting a new one in its place without having to discard the complete set. This procedure, however, is at the discretion of each individual guitarist. It is a known practice that one new string added to a plurality of old strings somewhat distorts the tonal flavor.

Accordingly, the cartridge string guitar assembly provides a guitarist for changing strings quickly before or in between concerts and recording sessions; enables a guitarist to replace a broken string with a complete set of new strings in between the musical selections during which he is performing live on a bandstand; and provides such a construction which is effective, inexpensive, and simple in assembly, operation and use and which achieves all the enumerated objectives, provides for eliminating difficulties encountered with prior assemblies, and solves problems and obtains new results in the art.

Changes in shape, size and rearrangement of details and parts such as come within the purview of the invention claimed may be resorted to, in actual practice, if desired.

In the foregoing description, certain terms have been used for brevity, clearness and understanding but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such terms are used for descriptive purposes and are intended to be broadly construed.

Having now described the principles, features and discoveries of the invention, the manner in which the improved cartridge string guitar assembly is constructed, assembled and operated, the new construction and characteristics, and the advantages, new and useful results obtained; the new and useful arrangements, structures, elements, devices, parts and combinations are set forth in the appended claims.

I claim:

1. A cartridge string guitar assembly including a sliding U-shaped key head adapted to receive a unified pair of cartridge string housing means, said housing means comprising six guitar strings therein; a slider means mounted horizontally on each of the two inner sides of said key head; a guitar neck shank recessed narrowly at the front portion thereof which slidably extends into the hollow intermediate portion of said key head; a slideway means mounted horizontally on each of the two outer sides of said neck shank thereby facilitating a sliding mechanism for said key head; a cam means pivotally mounted on a base support means upon the front end portion of said neck shank for operatively projecting said key head forward; a bridge means securely mounted to the normal body of the guitar having a deeply recessed horizontal groove disposed through the backside thereof for receiving a detachable rear string bracket means therein.

2. The construction defined in claim **1** in which the key head includes six square upstanding key posts independently spaced thereon for receiving the string housing means, said square key posts revolvable upon rotative movement thereof from gear-driven tuning handles; in which a follower lining means is securely fixed to the inner front surface contour of said key head; and in which a vertical elongated locking slot means is provded at the end of said follower lining means.

3. The construction defined in claim **1** in which the cam means includes a shaft adapted to pivot said cam means mounted in proper holes of the base support means and having a square socket which extends vertically through the axis of said shaft; a detachable lever means having a square drive provided on one end

thereof for inserting same into said square socket thereby actuating said cam means from inoperative to operative position; and in which a roller bearing means is revolvably mounted in the upper equidistant curve of said cam means whereby said roller bearing means operatively revolves against the follower lining means and subsequently rests in the elongated locking slot when said cam means is turned from inoperative to operatively tangent position thereby motoring the key head outwardly forward on the slideway means.

4. The construction defined in claim **1** wherein the rear string bracket means includes recessed corners at the front portion thereof to form a central point for releasably injecting said rear bracket means into the horizontal groove until its wide portion abuts with the corners of said groove of the bridge means; and in which said rear bracket means includes six horizontally aligned holes for receiving the tail portions of the six respective guitar strings therein as a unit.

5. The construction defined in claim **1** in which the pair of cartridge string housing means are formed in slender channel-shaped sections linked together by a flexible connecter means securely fixed to the front portions thereof for combining the said pair in parallel unison; in which six cylindrical string spools are independently revolvably disposed in vertical openings in said cartridge housing means each receiving a respective guitar string encircled thereon; and in which a square socket extends vertically through the axis of each said string spool for releasably installing same onto the corresponding square key posts of the key head for independently tuning each string manually.

6. The construction defined in claim **5** in which the cartridge string housing means includes six string guide means independently spaced near their respective spools, said string guide means each comprising an eyelet through which the front portion of a guitar string protrudes to prevent unraveling of same when not in use; in which an auxiliary eyelet is provided in each of said spools into which a guitar string tip extends to prevent said string tip from slipping when being tuned; and in which each of said spools contains a respective guitar string encircled thereon whereby said strings are individually tuned to pitch when said cartridge string housing means is installed onto the sliding key head.

* * * * *