

(No Model.)

3 Sheets—Sheet 1.

W. H. GILMAN.

ELECTRICALLY OPERATED STRINGED MUSICAL INSTRUMENT.

No. 565,739.

Patented Aug. 11, 1896.

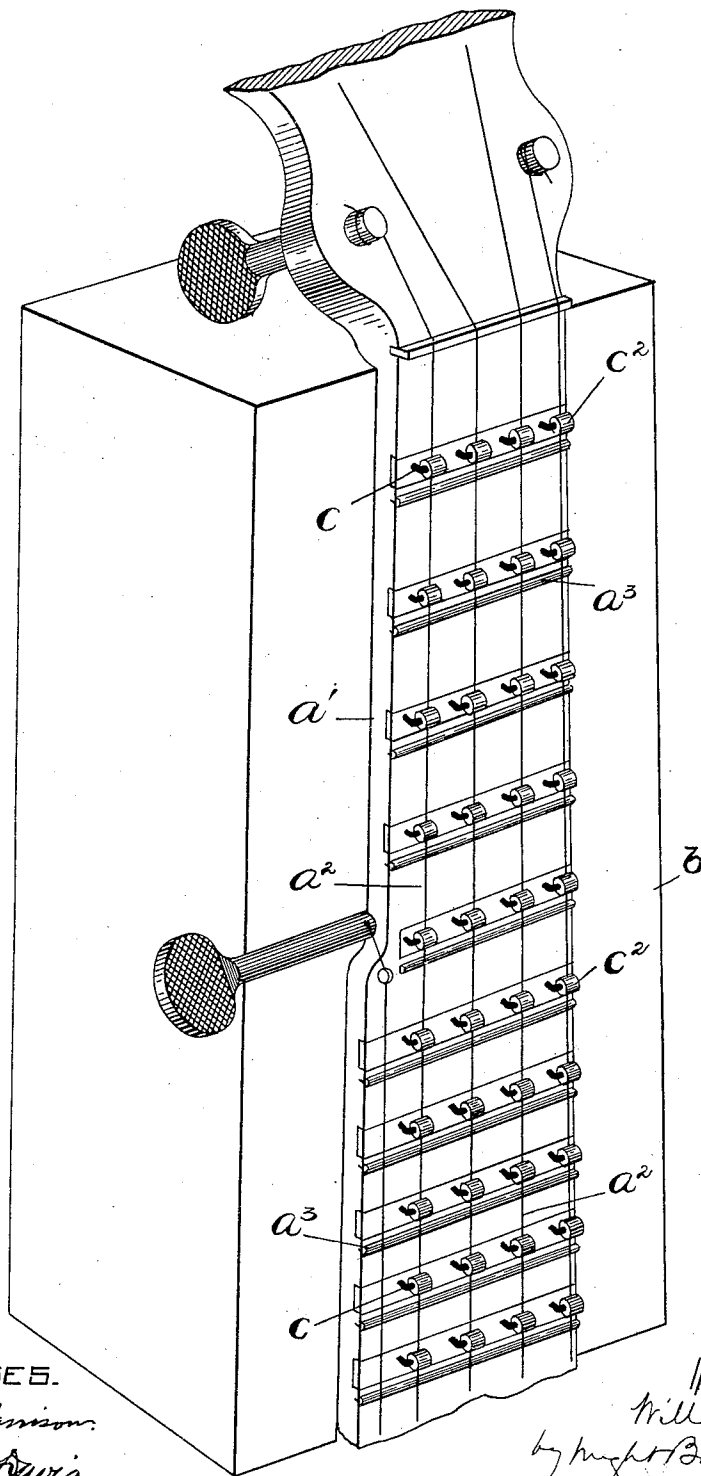


Fig. 1.

WITNESSES.

A. J. Harrison.
Mark Davis.

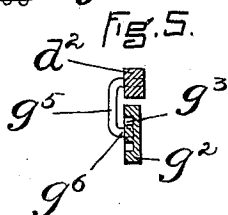
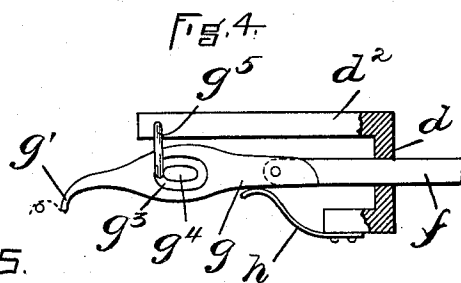
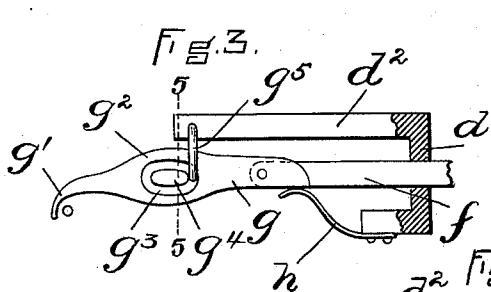
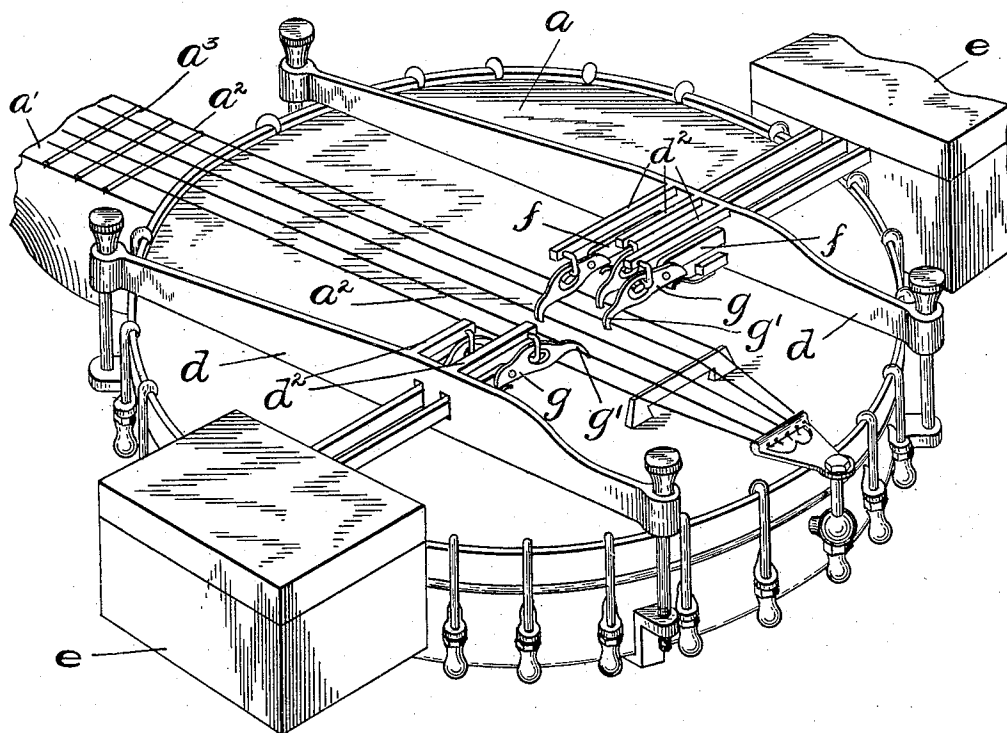
INVENTOR.
William H. Gilman
by Hugh Brown & Son
Atty.

3 Sheets—Sheet 2.

ELECTRICALLY OPERATED STRINGED MUSICAL INSTRUMENT.

Patented Aug. 11, 1896.

Fig. 2.



A. J. Harrison.

Parker Davis.

William H. Gilman

by night Brown & Quinby
Atty

(No Model.)

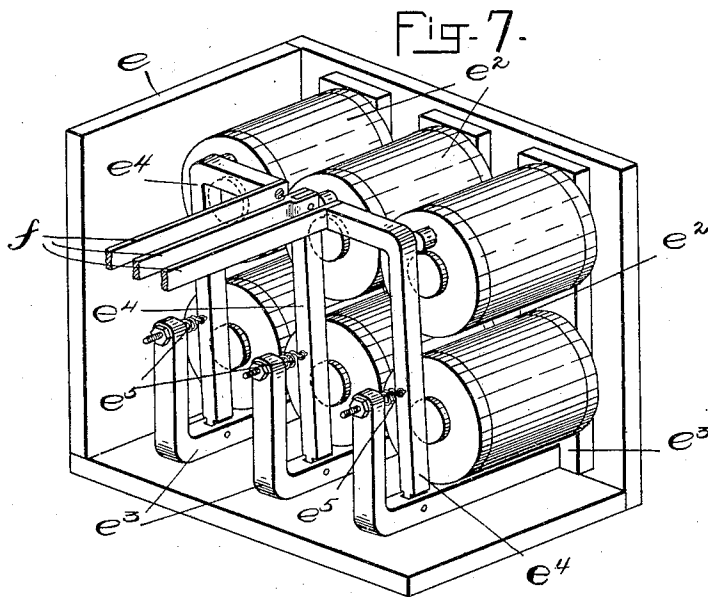
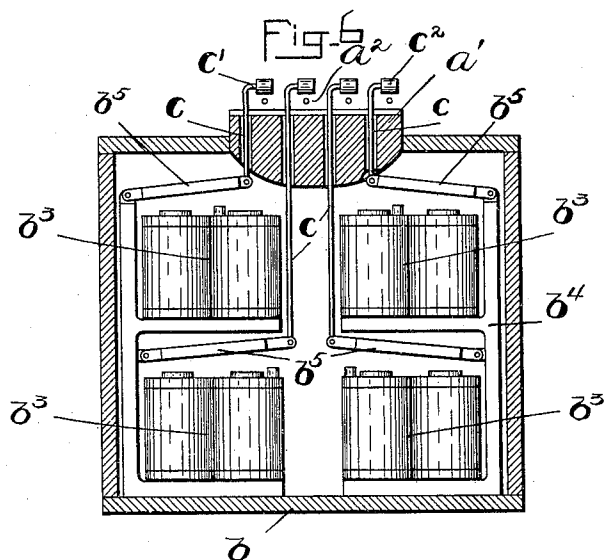
3 Sheets—Sheet 3.

W. H. GILMAN.

ELECTRICALLY OPERATED STRINGED MUSICAL INSTRUMENT.

No. 565,739.

Patented Aug. 11, 1896.



WITNESSES:

A. D. Hamann
Parker Davis.

INVENTOR:

Willard H. Gilman
by
Nigh, Brown & Quincy
Attorneys.

UNITED STATES PATENT OFFICE.

WILLARD H. GILMAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN AUTOMATIC BANJO COMPANY, OF NEW YORK, N. Y.

ELECTRICALLY-OPERATED STRINGED MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 565,739, dated August 11, 1896.

Application filed July 21, 1894. Serial No. 518,189. (No model.)

To all whom it may concern:

Be it known that I, WILLARD H. GILMAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electrically-Operated Stringed Musical Instruments, of which the following is a specification.

This invention relates to electrically-operated stringed musical instruments, and is an improvement on the apparatus shown and described in Letters Patent of the United States No. 488,520, granted to me December 20, 1892.

My present invention has for its object to improve the construction of the apparatus shown in said patent, which improvements will be hereinafter described and then pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a perspective view of a portion of the neck of the instrument. Fig. 2 shows a perspective view of the sounding-board and appurtenances. Figs. 3 and 4 show detail views of one of the improved pickers in the two different positions it occupies at the ends of the strokes of the reciprocating bar which carries the picker. Fig. 5 shows a cross-section taken on the line 5 5 of Fig. 3. Fig. 6 shows a sectional view of the neck of the instrument and the case behind the same which contains the electromagnets. Fig. 7 shows an inside perspective view of one of the cases located at the sides of the sounding-board and containing the electromagnets which control the pickers.

The same letters of reference indicate the same parts in all the figures.

I have here shown my invention applied to a banjo, but it will be evident that it is equally applicable to other forms of stringed instruments.

The reference-letter *a* designates the sounding-board of the banjo; *a'*, the neck of the same; *a²*, the strings, and *a³* the frets. The casing *b* is secured to the rear side of the neck *a'*, and within this case are arranged a series of electromagnets *b³*, one for each fret on the neck. As here shown, the electromagnets are mounted in a number of rows and one above the other, and they are supported by

brackets *b⁴*, suitably fastened within the casing *b*. Armatures *b⁵* are pivoted to these brackets *b⁴* and extend over the magnets, there being one armature for each magnet. Rods or fingers *c* are pivotally connected with the ends of the armatures and extend through channels provided for them in the neck *a'*. These rods or fingers have lateral end portions *c'*, preferably carrying rollers *c²* and standing over the strings *a²*. One of these rollers is over each string at each fret.

The electromagnets *b³* will all be suitably connected with some source of electricity and will be cut in and out by means of perforated music-sheets or other devices, so that the fingers will press the strings in contact with the frets in proper order for producing the desired tune.

A pair of bars *d* are clamped to the sounding-board *a* in such a manner that they extend parallel with each other on opposite sides of the strings *a²*, and these bars have projecting arms *d²*, as many as there are strings on the instrument, from which arms the pickers are suspended. A box or casing *e* is located at each side of the sounding-board, and within these boxes or casings are contained a number of electromagnets *e²*, supported by suitable brackets *e³*. An armature *e⁴* is pivoted at one end of each bracket and extends over the electromagnets supported by the bracket, and a spring *e⁵* connects the armature with one part of the bracket and holds the said armature normally away from the electromagnet. Each armature has connected with it a bar *f*, which projects out of the casing *e* and extends through an opening in one of the bars *d*. A picker *g* is pivoted to the outer end of each bar and comprises a hook-shaped end *g'* to engage a string of the instrument and an enlarged central portion *g²*. An oblong cam-groove *g³* is formed in one side of the enlarged part of the picker, with a boss *g⁴* at the middle of the groove, and a link *g⁵*, rigidly connected with one of the arms *d²*, depends therefrom and has an end portion *g⁶* engaging the groove *g³*.

A spring *h* is rigidly fastened at one end to an arm of the bar *d* and at its outer end bears with sliding contact against the picker *g*. In the normal position of the picker its

hooked end g' projects over the string, as illustrated in Fig. 3, and the spring h bears against the picker on the inner side of the pivot thereof. When the bar f is moved by the action of the electromagnet, the hooked end of the picker is caused to move downward, partly under the string, by reason of the engagement of the link g^3 in the groove g^3 and the pressure of the spring h against the inner end of the picker. When the bar f reaches the limit of its movement, the spring h will be on the outer side of the pivot of the picker, and as the said bar is returned by the spring e^5 the hooked end of the picker moves upward again and over the string to its first position by reason of the engagement of the link g^5 in the groove g^3 and the upward pressure of the spring h on the outer side of the pivot. It will thus be seen that as the bar f is reciprocated a motion is imparted to the picker exactly similar to that of the fingers of the human hand when picking the strings of the instrument, and therefore I obtain the same effect in the sound of the strings as when the instrument is played by hand.

The electromagnets e^2 will be suitably connected with some source of electricity and will be cut in and out by means of a perforated music-sheet or other device, so that the action of the pickers will accord with that of the fingers over the frets and the proper strings will be picked.

It is evident that the construction here shown is susceptible of variations, and therefore it is to be understood that I do not confine myself to such construction, but consider myself entitled to all changes within the scope of the invention.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without at-

tempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A stringed musical instrument comprising in its construction the sounding-board or head having guide-bars extending across the face thereof parallel with the strings, slide-bars extending through the guide-bars and provided with pickers at one end, electromagnets at the side of the head and having their armatures connected with said slide-bars, the fretted neck having perforations and a plurality of electromagnets secured to the rear side of said neck, and fingers connected with the armatures of said magnets and extending through and guided by said perforations, the ends of said fingers being extended over the strings between the frets, substantially as described.

2. A stringed musical instrument comprising the sounding-board or head a and the fretted neck a' having openings, the casing b secured to the rear side of the neck and containing electromagnets b^3 , the armature b^3 , rods c pivoted to the armatures and extending through and guided by the openings in the neck and having end portions adapted to depress the strings, the bars d clamped to the head, casings e at the sides of the head containing electromagnets e^2 , and slide-bars guided in the bars d and carrying pickers at one end and connected to the armatures of the magnets e^2 , substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 27th day of March, A. D. 1893.

WILLARD H. GILMAN.

Witnesses:

ARTHUR W. CROSSLEY,
G. PARKER DAVIS.