(No Model.)

C. E. GUERRE & G. H. MARTIN.

MUSICAL INSTRUMENT.

No. 472,453. Patented Apr. 5, 1892.

Fig. 1

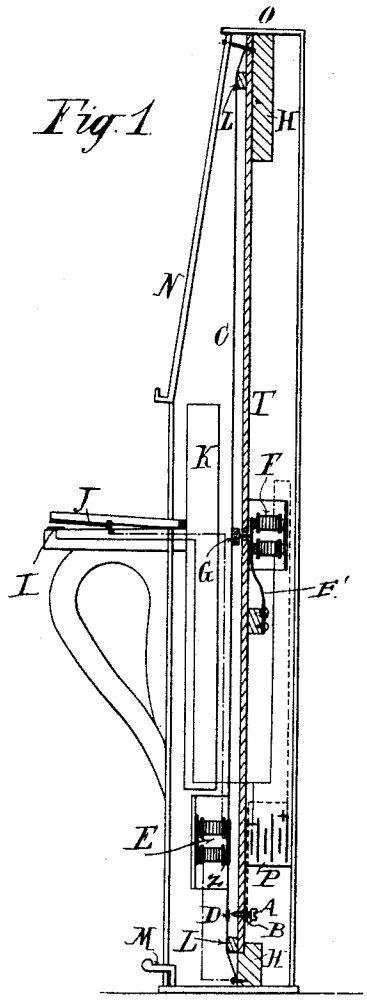
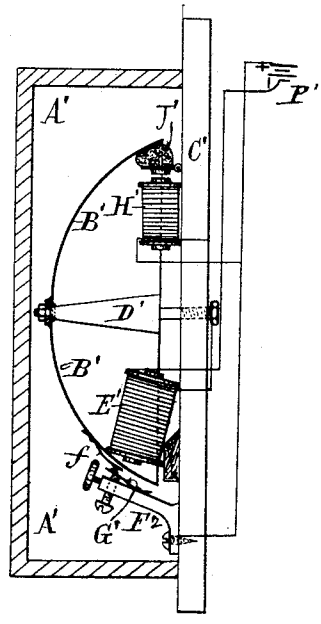


Fig. 2



Witnesses:
Arthur Goode
Fidèle Pomerleau

Inventors:
Charles Emile Guerre
Gaston Henri Martin

UNITED STATES PATENT OFFICE.

CHARLES EMILE GUERRE AND GASTON HENRI MARTIN, OF ROUEN, FRANCE.

MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 472,453, dated April 5, 1892.

Application filed January 21, 1891. Serial No. 378,621. (No model.)

To all whom it may concern:

Be it known that we, CHARLES EMILE GUERRE and GASTON HENRI MARTIN, citizens of the French Republic, and residents of Rouen, Department of Seine-Inférieure, France, have invented new and useful Improvements in Musical Instruments, of which the following is a specification.

Our invention relates to musical instruments wherein a sonorous body—such as a tightly-stretched metallic or gut string or cord or a glass or metal bell—is caused to vibrate by manipulating a series of keys; and its object is to dispense with the hammers commonly employed and cause the sonorous body to vibrate by an electric current, which is closed and opened by the manipulation of the keys or by other proper means, the instrument so installed being termed by us an "electro-magnetic palsiphone."

The invention consists in the construction, arrangement, and combinations of parts, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference designate corresponding parts in both the views.

Figure 1 is a vertical transverse section of an upright stringed musical instrument having our invention applied, and Fig. 2 is a sectional view of a portion of an instrument containing a bell and having our invention applied.

Referring to Fig. 1 of the drawings, A is one of a series of contact-screws located in the lower portion of the sounding-board T of the instrument, and B is a plate surrounding said screw next the back of the sounding-board and in electrical connection with the positive pole of the battery P.

The strings or cords C are attached at their ends in the usual manner to pins passing through the sounding-board and the cleats H, to which it is secured, and are stretched over nuts or blocks L on the outer face of the sounding-board. The strings if constructed of gut are provided with a metallic armature Z, controlled by electro-magnets E, properly supported in the lower part of the instrument in front of the sounding-board, and with a plate D, of platinum, adapted to contact with the screw A.

At the rear of the sounding-board are properly-supported electro-magnets F, acting on a spring F′, secured to the sounding-board, from which spring a pin projects through an opening in the sounding-board and carries at its outer end a damper G, of felt, leather, or other suitable material and adapted to press on the strings C.

The keyboard of the instrument has negative contacts I in electrical connection with the electro-magnets F and the battery P. The keys have positive contacts J in electrical connection with the electro-magnets E. The latter are in electrical connection with the lower attaching-pin of the strings C, and the battery P is in electrical connection with the electro-magnets F and the contacts J of the keys of the instrument.

The instrument is provided with valves K, operated by a foot-lever M, both of any approved construction, to increase the volume of tone or give the "forte" and has a front N, affording a rest for books or sheet-music, and a cover O.

In operation when the keys are depressed the positive contacts of the same bear upon the negative contacts of the keyboard, and the electric current then passes to the electro-magnets E and attracts the armature Z on the strings, or attracts the strings if the latter are constructed of metal. When the keys are released from pressure, the electric current passes to the electro-magnets F, and, through the screw A and plate D of the strings, releases the armature Z from the electro-magnets E, or, through the screw A, releases the strings, if they are of metal, and this successive attraction and release of the strings causes them to vibrate and give forth musical sounds.

In Fig. 2 of the drawings the case A′ of the instrument contains a bell B′ of any preferred material—such as glass, silver, or any other proper metal—the post D′ of the bell being secured by a screw to a support C′.

Upon the support C′ is suitably held an electro-magnet E′, and below the same and the bell is held a bracket F^2, carrying a contact-spring G′, adapted for adjustment toward or from the bell by a screw passing through the bracket to a bearing on the spring and itself held in place by a thumb-screw. To the outer face of the bell B′ is attached a

contact-spring *f*, the free end of which extends over the free end of the spring G'. On the support C' is also held an electro-magnet H', controlling a damper J', of felt, leather, or other suitable material, and hinged to the support C' above the electro-magnet.

The electro-magnet E' is in electrical connection with the negative pole of the battery P' and with the supporting-screw of the bell-post, and the electro-magnet H' is in electrical connection with the bracket F^2 and the positive pole of the battery. As the electric circuit is successively closed and opened by the manipulation of keys or by other means therein, the electro-magnets are alternately energized, the one causing the bell to vibrate and the other arresting such vibration, so that the bell gives forth a succession of musical sounds.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A musical instrument consisting of a casing, a sonorous body mounted in the casing, an electrical device for vibrating the sonorous body, and an electrically-operated damper arranged to operate in alternation with the vibrating device, substantially as shown and described.

2. A musical instrument consisting of a casing having a keyboard, a sonorous body mounted to vibrate in the casing, an electrical device connected with the keyboard for vibrating the sonorous body, and an electrically-operated damper arranged to operate in alternation with the vibrating device, substantially as shown and described.

3. A musical instrument consisting of a casing having a keyboard, a sonorous body mounted to vibrate in the casing, an electric battery, vibrating and damping electro-magnets in the circuit of the battery, and electrical connections between the keyboard, the electro-magnets, and the sonorous body, substantially as shown and described.

4. In a musical instrument, the combination, with a casing provided with a sounding-board and a keyboard, each having electrical contacts, and a sonorous body mounted to vibrate on the sounding-board and having electrical contacts, of an electric battery, vibrating and damping electro-magnets in the circuit of the battery, and electrical connections between the keyboard, the electro-magnets, and the sonorous body, substantially as shown and described.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 9th day of September, 1890.

CHARLES EMILE GUERRE.
GASTON HENRI MARTIN.

Witnesses:
ARTHUR GOOD,
FREDRIC PARMENTER.