

(No Model.)

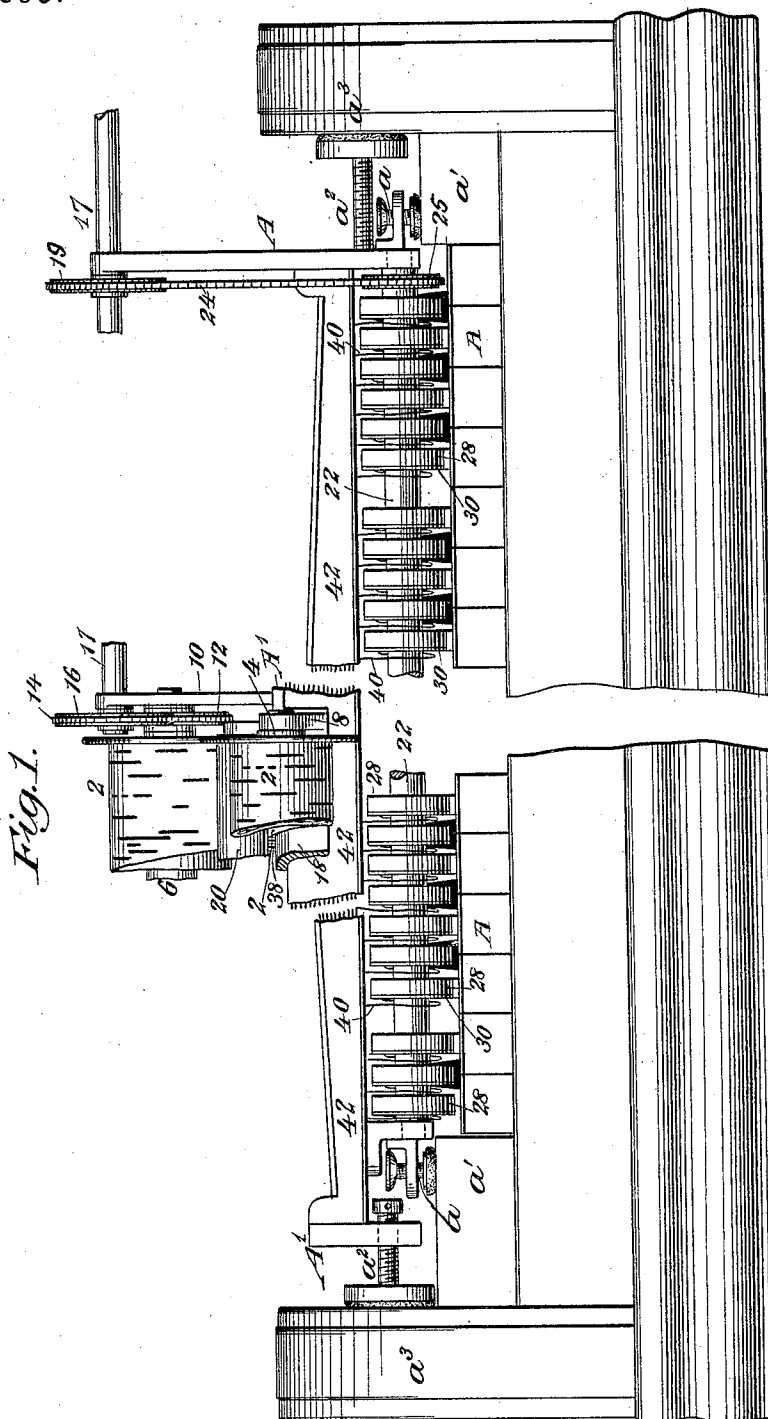
2 Sheets—Sheet 1.

J. D. CASE.

KEYBOARD ATTACHMENT FOR MUSICAL INSTRUMENTS.

No. 529,895.

Patented Nov. 27, 1894.



Witnesses:
W. H. Hayworth
C. H. Ferguson

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By his Attorney Henry F. Decker.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

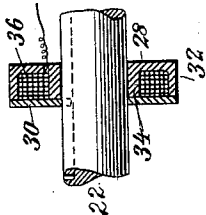


Fig. 4.

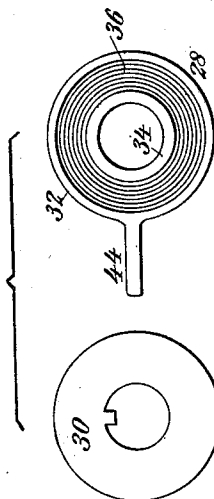
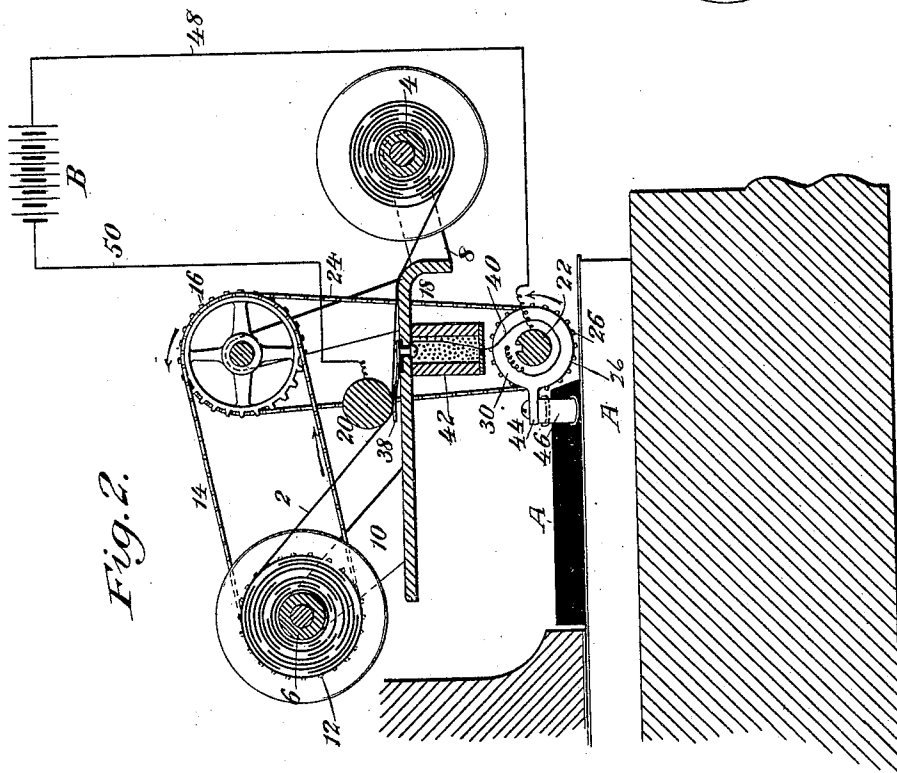


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH D. CASE, OF PLAINFIELD, NEW JERSEY.

KEYBOARD ATTACHMENT FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 529,895, dated November 27, 1894.

Application filed March 30, 1893. Serial No. 468,275. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH D. CASE, of Plainfield, county of Union, and State of New Jersey, have invented a certain new and useful Improvement in Keyboard Attachments for Musical Instruments, of which the following is a specification.

The object of my invention is to provide an electro-magnetic device for operating the sound producing devices of a musical instrument, which, owing to its lightness and compactness may be easily attached or detached from a musical instrument, and the invention consists in a motor comprising an electro-magnet and an armature, one of said parts having a rotary motion and the other of said parts having an operative connection with the sound producing device of a musical instrument.

My invention further consists in the construction and novel arrangement of parts as hereinafter specified and particularly set forth in the appended claims.

In the accompanying drawings: Figure 1, is a front elevation of a device embodying my invention, shown in connection with a piano-forte. Fig. 2, is a transverse vertical section. Fig. 3, is a sectional view on an enlarged scale of one of the motors, and Fig. 4, is a side view of the parts of the motor.

I have shown and will describe the device in operative connection with the keys of a musical instrument, but it is to be understood that it may be connected with other parts or sound producing devices without departing from the spirit of my invention.

Referring by reference characters to the drawings A designates the keys of a musical instrument.

A', designates a frame of suitable material constructed to be mounted on the frame or key-board of a musical instrument. It is shown as having leveling screws a , to bear upon the portions a' , of the frame and as having clamping or abutting screws a^2 , to engage against the cheek pieces a^3 , and secure the device from longitudinal movement.

2, designates a music controller, here shown as a perforated sheet of the usual construction movable from the feed roller 4, to the take up roller 6. The roller 4, has jour-

nal bearings in arms 8, extending from the frame A', and the roller 6, has journal bearings in arms 10, extending from the frame.

The music controller is designed to have a continuous movement during the playing of a tune or series of tunes and to impart the motion thereto I have shown the roller 6, as having a sprocket wheel 12, attached to it and around which a sprocket chain 14, extends to a drive pulley 16, mounted on a main shaft 17, having a journal bearing in an arm extending upward from the frame A'.

Any desired motor may be employed for operating the drive pulley, and it is to be understood that a plain band and pulley mechanism may be employed instead of the sprocket mechanism shown but the sprocket mechanism may be preferable to impart a positive motion.

The music controller extends from the roller 4, over a mold board 18, and in contact with a metallic roller 20, having journal bearings in arms extending from the frame of the device or from the mold board 18.

I will now describe the motor mechanism for operating the sound producing devices.

22, designates a rotary shaft of suitable non-magnetic material, such as brass, having journal bearing in the frame of the device and having a constant rotary motion imparted to it by means of a sprocket chain 24, passing around a sprocket wheel 25, on the shaft 22, and engaging with a drive pulley 19, on the shaft 17.

26, indicates the motors. There is one of these motors for each key of the musical instrument insulated one from another. Each motor consists of an electro-magnet 28; and an armature 30. The armature, as here shown consists of a disk of metal secured on the shaft 22, by means of a key, or otherwise. Each electro magnet consists of a yoke portion having a flange 32, forming one pole of the magnet, and a hub portion 34, which is loosely mounted on the shaft 22 and forms the other pole of the magnet. An insulated wire 36 is coiled around the hub 34, and has one end projected through the hub or otherwise in electrical contact with the shaft 22, and the other end of the wire is extended outward through a hole in the flange 32, to a contact piece 38, preferably of resilient metal pro-

jected through the mold board 18, and bearing against the roller 20.

For convenience and for the purpose of hiding from view the several wires 40, I extend them through a conduit 42, of box like construction, secured to the under side of the mold board 18, and extended lengthwise of the musical instrument as shown. This conduit 42 forms a portion of the frame A', and it is shown as arched toward the center thereby giving strength and stiffness to the structure.

A connection extends from the motor to the key of the musical instrument. The connection here shown consists of an arm 44, extending outward from the electro-magnet 28, and from this arm a finger 46, extends downward to contact with a key of the musical instrument.

There may be a reverse construction or operation of the motor from that above described, that is, the electro-magnet may be affixed to rotate with the shaft 22, and the armature may have operative connection with the key of the musical instrument, and it is to be understood that the part secured to the shaft 22, need not be disk shaped.

The electro magnets may be energized from any desired source of electricity. I have here shown a battery B, from one pole of which a wire 48, extends to electrical contact with the revolving shaft 22, and from the other pole of which a wire 50, extends to electrical contact with the roller 20.

The contact surfaces of the electro-magnets and armatures are preferably highly polished and the said surfaces are made as slight as possible so as to reduce the friction to a minimum, and to render the device operative with a comparatively weak current or battery power.

In operation the device is placed upon the musical instrument with the parts 46, bearing lightly on the keys, and then the music controller is set in motion. The perforations forming the notes in the music controller will allow the engagement of the contact pieces 38, with the roller 20, thus closing the circuit to energize an electro-magnet which engaging with its armature will oscillate and press the key of the musical instrument downward to sound the note. The rotative armature drags the electro magnet down until the resistance of the key is met when the electro magnet

ceases to move but the armature keeps on revolving, slipping on the face of the electro magnet until the current is broken, when the key throws the electro magnet back in position again.

Having described my invention, what I claim is—

1. The combination with a musical instrument and a source of electricity, of an electro-magnet and an armature co-acting therewith mounted on a rotary shaft; one of said parts being rigidly attached to the shaft, and the other of said parts being constructed to operate a sound-producing device of said musical instrument.

2. The combination with a musical instrument and a source of electricity, of a revolving armature and an electro-magnet co-acting therewith and adapted to operate a sound producing device of said musical instrument.

3. The combination with a musical instrument and a source of electricity, of a motor mounted on a rotary shaft and having operative connection with a sound producing device of the musical instrument, electrical connections between said source of electricity and motor and a music controller operating to make and break the electric current.

4. The combination with a source of electricity and a traveling music controller operating to make and break the electric current, of a rotary shaft, a motor consisting of an electro-magnet loosely mounted on said shaft, and an armature rotative with said shaft, a connection between said electro-magnet and a sound producing device of the musical instrument, and the electrical connections.

5. The combination with a source of electricity and a rotary shaft, of a motor comprising an armature connected to and rotating with said shaft, and an electro-magnet loosely mounted on the shaft and adapted to co-act with said armature when energized.

6. In a music player, the combination with the frame comprising a conduit for wires, arched toward its center, leveling screws therefor and adjustable devices adapted to abut against the cheek pieces of a musical instrument and secure the frame in position.

JOSEPH D. CASE.

Witnesses:

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