Feb. 7, 1933. M. CLARK 1,896,683

TONE AMPLIFIER

Filed March 30, 1931

Fig. 2.

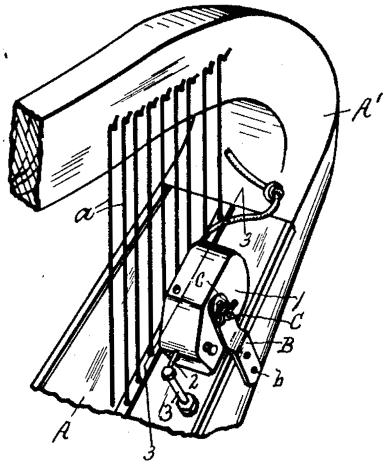


Fig. 3.

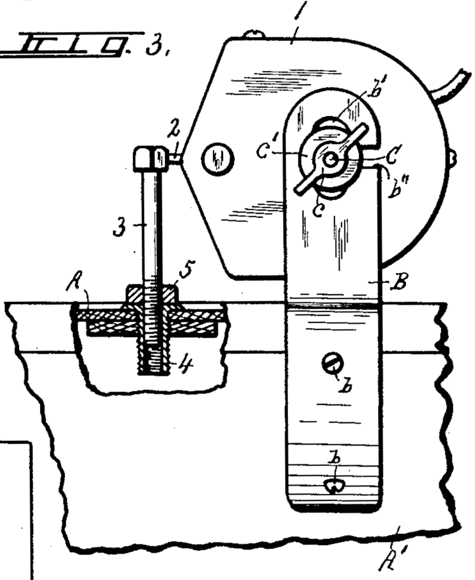
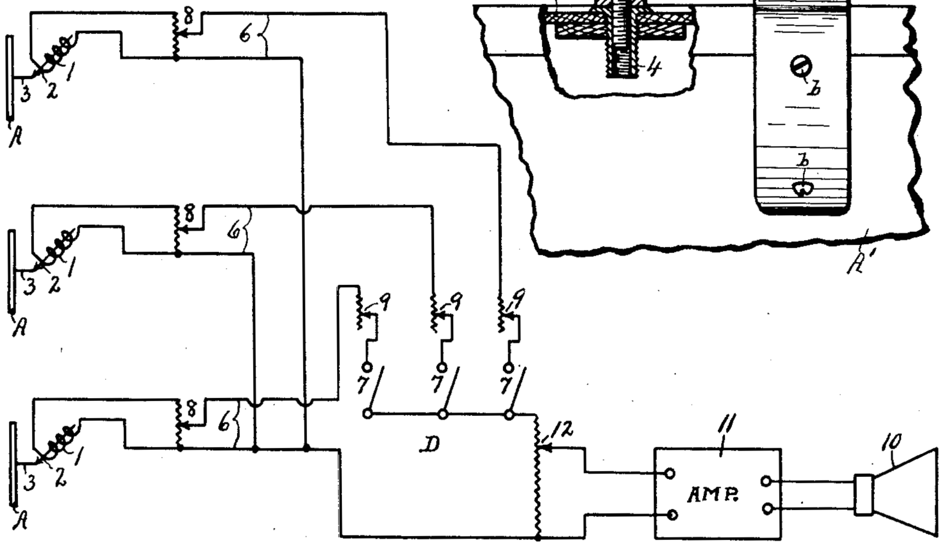


Fig. 1.



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UNITED STATES PATENT OFFICE

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TONE AMPLIFIER

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This invention relates to an apparatus for converting the vibrations of any vibratory element or elements into electrical impulses and translating said impulses into sound, and is particularly useful in amplifying the tones of musical instruments either individually or in various combinations.

It is well known that the volume of the tones of many of the smaller instruments, while sufficient for pleasing effects in the relatively small rooms of private houses and auditoriums, is frequently insufficient in the larger concert halls and the like, and that this is particularly true when these instruments are played in concert or orchestral renditions.

The main object of the present invention is to provide simple and highly efficient means for electrically converting the vibrations of the sounding board or other vibratory element of a musical instrument into corresponding sounds, amplifying said sounds and controlling the volume of the electrical impulses in transit to the amplifying means.

One of the specific objects is to convert the vibrations of any vibratory element into electric impulses through the medium of an instrument technically known as an electric "pickup" and rigid connections between its armature and the vibratory element so that the frequency and instensity of the electric pulsations will exactly correspond with the frequency and amplitude of vibrations of the vibratory element, thereby reducing to a minimum the liability of electric impulses which are out of harmony or synchronism with such vibrations.

Another object is to enable the vibrations of a plurality of vibratory elements to be simultaneously or selectively translated into sound through the medium of a single sound translating device common to all of said elements.

In other words I have sought to provide a more convenient and practical means for amplifying and controlling the amplification of the tones of any one or more musical instruments in solo, accompaniment or orchestral renditions than has heretofore been practised.

Other objects and uses relating to specific parts of the apparatus and to the method of using the same will be brought out in the following description.

In the drawing:—

Figure 1 is a diagrammatic view of my improved tone amplifying apparatus as used in connection with a plurality of vibratory elements for selected and group control of the translation of the vibrations of any one or more of said elements into sound.

Figure 2 is a perspective view of a portion of a relatively small Irish harp with an electric pickup operatively mounted thereon, and the rigid connections between the needle of the pickup and the sounding board or vibrating element of the harp.

Figure 3 is an enlarged face view of the electric pickup and adjacent portion of the frame of the harp showing in section the rigid connection between the armature of the pickup and sounding board of the harp, taken in the plane of line 3—3, Figure 2.

In order that the range of use of the apparatus may be clearly understood I have shown in Figure 1 a plurality of, in this instance three, vibratory elements —A— and a corresponding number of electric pickup devices 1, each having its armature or vibrator 2 rigidly connected to the corresponding element —A— through the medium of a screw-threaded connector rod 3 egaging an internally threaded sleeve or bushing 4 which is also threaded externally and screwed tightly into the vibrating element —A—, as shown more clearly in Figure 3, the rod 3 and sleeve 4 being rigidly held against relative movement by a lock nut 5 engaging the threaded portion of the bolt and outer end of the sleeve.

The vibrating member —A— is shown as consisting of a sounding board of a relatively small harp —A′— having the usual strings —*a*—.

Each pickup 1 is detachably mounted upon a supporting bracket —B— which in turn is secured by screws or equivalent fastening means as —*b*— to the non-vibratory body of the instrument such as the harp —A′—