June 26, 1928. 1,675,102

N. H. HOLLAND

ADJUSTABLE REFLECTOR SYSTEM FOR RECORDING

Original Filed Dec. 4, 1920

Fig. 1.

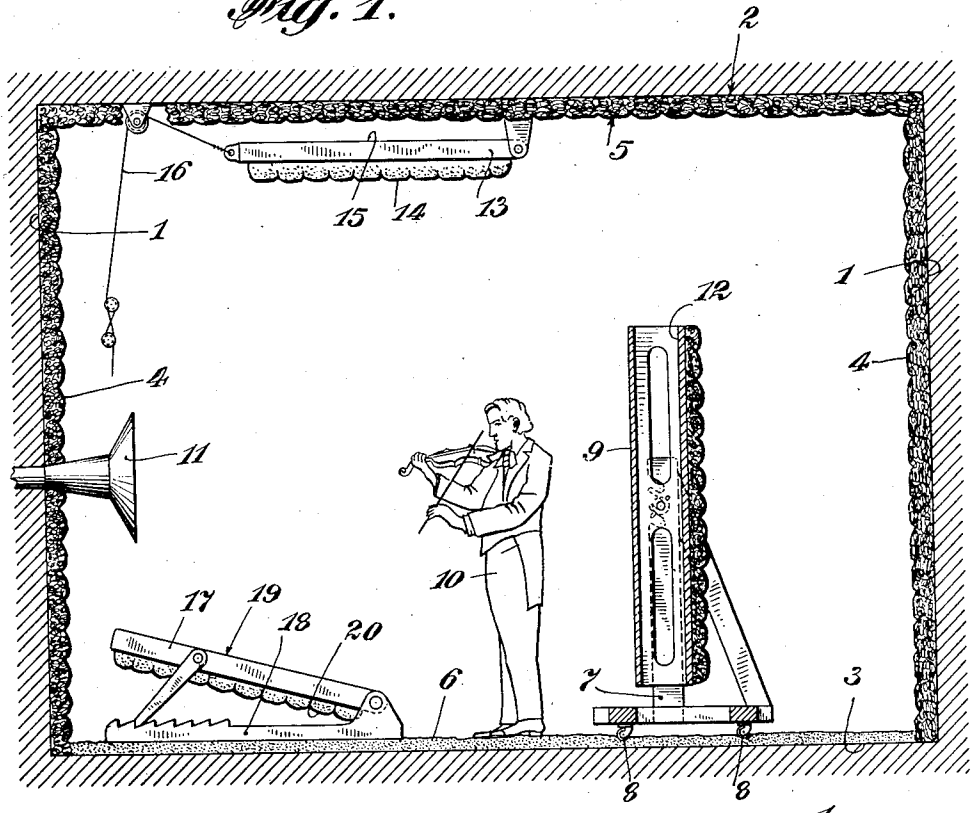


Fig. 3.

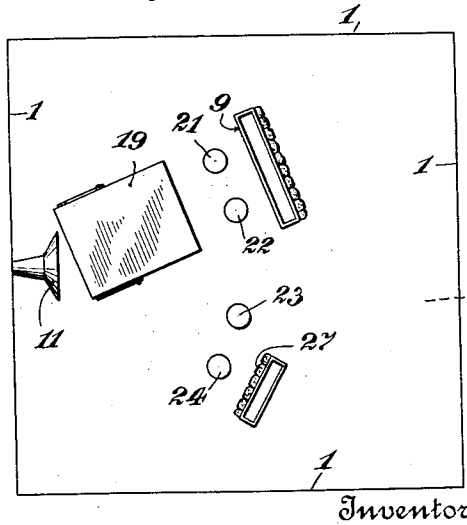
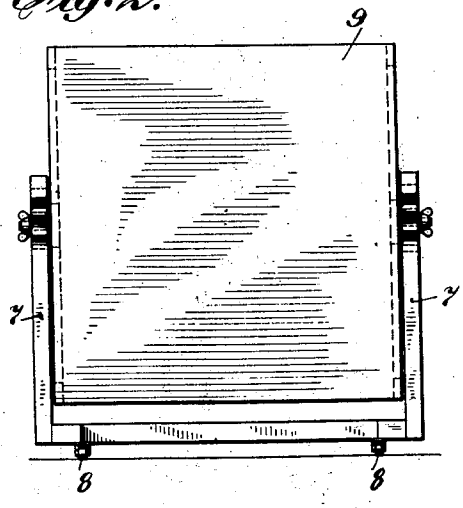


Fig. 2.



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UNITED STATES PATENT OFFICE.

NEWMAN H. HOLLAND, OF WEST ORANGE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ADJUSTABLE REFLECTOR SYSTEM FOR RECORDING.

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In phonograph sound recording by the well-known types of recording instruments the performers, whether they be speakers, singers, or musicians are placed very close to the recording instrument and the sound reflecting and resonant qualities of the room are not found to be of great importance. The crowding of the performers near the recording instrument prevents as efficient recording as can be done if a longer range instrument is provided and a more flexible positioning of the performers made possible.

I have been interested in the development of a long range type of electrical recording instrument and find that its longer range makes the reverberation and resonance of the room objectionable, and for this reason a non-reflecting padded recording room has been provided. The non-reflecting room alone is not wholly satisfactory as the records made in it sometimes sound "dead", which probably is caused by the lack of echoes and resonance in the recording room.

The object of my invention is to provide an environment of superior efficiency for making phonograph records by combining a non-sound reflecting room having the advantage of permitting pure reproductions, which, however, are not always the most pleasing, with means to provide such adjustable sound reflection and resonance to supplement the pure sounds as may be required to produce the most satisfactory and pleasing records.

Another object of my invention is to provide devices for supplying the adjustable reflection and resonance required in a non-reflecting room designed to contain a long range recording instrument, as will be more particularly described below.

Referring to the accompanying drawings:

Fig. 1 is a longitudinal cross section of a non-reflecting recording room provided with a long range recording instrument and adjustable sounding board reflectors;

Fig. 2 is a front elevation of a typical adjustable sounding board reflector; and

Fig. 3 is a diagrammatic plan view of the same room in use for the recording of several performers on the same record; also illustrating the adjustable reflection to the recording instrument by the sounding boards.

Referring to Fig. 1, numeral 1 indicates the walls; 2 the ceiling; and 3 the floor of my non-reflecting room. The walls 1 are provided with non-sound reflecting padding 4, the ceiling with similar padding 5, and the floor 3 with a heavy non-sound reflecting carpet 6.

In order to introduce adjustable sounding board reflection when required a sounding board stand member 7, mounted on castors 8, adjustably supporting a sounding board 9, in the indicated manner, is positioned behind the performer 10, so as to reflect toward and vary the sound at the long range recording instrument 11. At the back of the sounding board 9 a padded board 12 is mounted, which can be turned in the indicated position of the sounding board 9, in which event the padding will prevent the sounding board affecting the sound at the recording instrument 11.

Above the performer 10 there is suspended from the ceiling 2 a hinged member 13 padded upon its lower face 14 and provided with a sounding board 15 upon its upper face. The member 13 in its indicated position is non-reflecting, but it can be lowered by releasing the rope 16, so as to swing down at the back of the performer 10, thus adjusting the sounding board face 15 in a position to reflect toward and vary the sounds at the recording instrument 11.

At the foot of the performer 10 there is mounted on a conventional frame 18, which can be adjusted in the indicated manner, a member 17. The member 17 is provided with an upper sounding board face 19, which in its indicated position is designed to vary the sound at the recording instrument 11. The member 18 is also provided with a lower non-reflecting padded face 20 and can be inverted to prevent the sounding board 19 affecting the sound at the recording instrument 11.

In Fig. 3 the same room is indicated but with four sources of sound or performers 21, 22, 23, and 24. In this case the sources of sound 21 and 22 are affected by the sounding boards 9 and 19 the source of sound 23 is unaffected, and behind the source of sound 24 is placed a padded member 27. By this arrangement the reflection of sound toward the recording instrument 11 is adjusted selectively.

The arrangement of the reflectors may, of

course, be varied to suit the requirements for various records.

Modifications of this invention and the incorporation of its novel elements or combinations with other means may be made without departing from the spirit of this invention.

I claim:

1. A reversible sounding board, provided with a reflecting face and an opposite face of sound absorbing material.

2. An acoustic device for controlling the sound reflected from a source to a particular point consisting of a movable screen provided with both reflecting and absorbing members.

3. In a studio having sound absorbing walls the combination of a sound responsive device, and adjustable means having both reflecting and absorbing surfaces for controlling the amount of reflected energy received by the sound responsive device.

4. In a studio having sound absorbing walls the combination of a sound responsive device, a source of sound at long range from said sound responsive device, and a plurality of adjustable devices positioned at different points in the studio for controlling the amount of reflected energy received by said sound responsive device.

5. Equipment for long distance recording or radio broadcasting, comprising in combination a room having non-reflecting wall surfaces, a pick-up device in said room, and means for additionally varying and controlling the sound at the pick-up device, comprising means having both reflecting and absorbing surfaces, said means being adjustable with respect to the pick-up device.

6. In a studio having sound absorbing walls, the combination of a source of sound, a sound responsive device, and means for intercepting the sound from said source and operatively associated with said sound responsive device, said means being adjustable to reflect or absorb the sounds intercepted thereby to any desired degree.

7. In equipment for recording or broadcasting including a studio having all walls highly damped, the combination of a source of sound, a sound responsive device, and means for intercepting sound waves from said source, said means having adjustable sound reflecting and sound absorbing surfaces for controlling the amount of reflected energy received by said sound responsive device.

8. In a studio so damped as to be substantially acoustically dead, the combination of a source of sound, a sound responsive device and means comprising both reflecting and sound absorbing surfaces said means being positioned to one side of the direct acoustic path between said source and said device for adjustably controlling the amount of reflected energy received by the latter.

9. Apparatus for controlling the amount of reflected energy in studios for recording and broadcasting having both sound reflecting and sound absorbing surfaces, and means for adjusting the position of both surfaces.

10. A method of controlling sounds to be transmitted in an acoustic studio, which consists in eliminating sound reflections from all directions, and then introducing at different points in said studio the desired amount of reflection.

11. The method of controlling sounds to be transmitted in an acoustic studio, which consists in eliminating all sound reflections capable of influencing the character of the sounds to be reproduced, and then introducing such reflections as are necessary to give naturalness of tone to the reproduced sounds.

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