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Oct. 4, 1932. S. S. SUGAR 1,881,146

SOUND STUDIO

Filed Nov. 28, 1931

Sound absorbing!

Fig. 1.

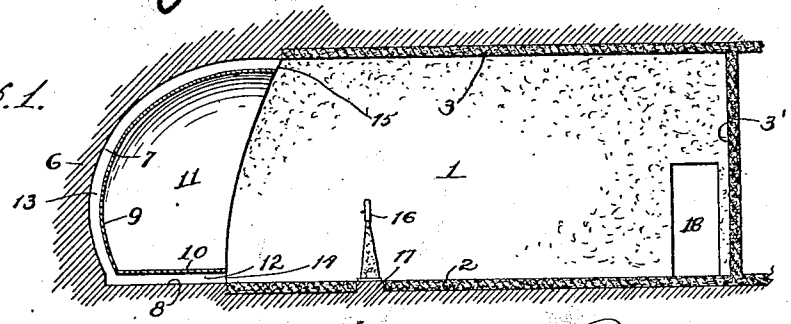


Fig. 2.

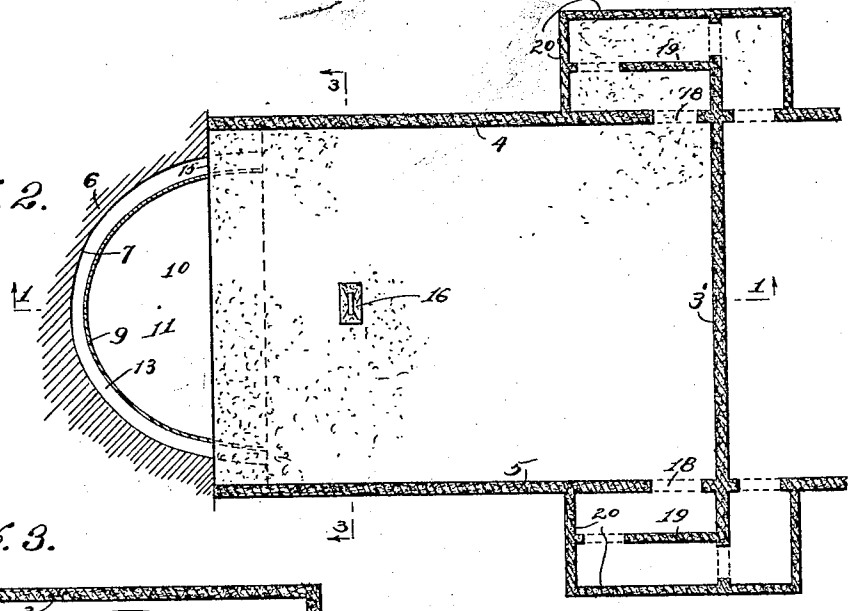


Fig. 3.

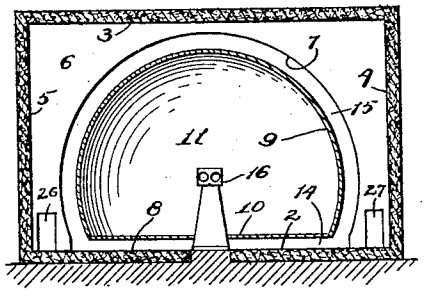
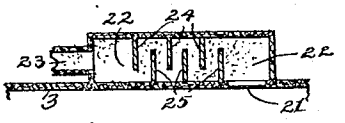


Fig. 4.



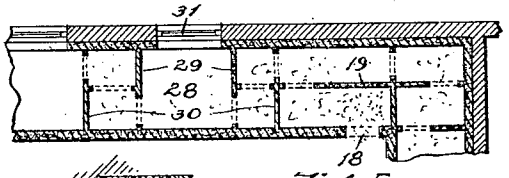
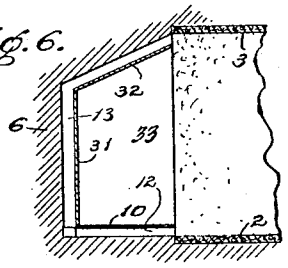


Fig. 5.

Fig. 6.



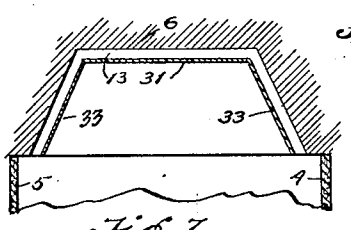


Fig. 7.

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UNITED STATES PATENT OFFICE

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SOUND STUDIO

Application filed November 28, 1931. Serial No. 577,766.

This invention relates to studios or compartments intended to be used for picking up sound impulses and translating them into energy for recording or for radio broadcasting purposes.

In studios of this character it is important that the sound impulses, as heard by the performers within the room, should possess aural naturalness and must not be blurred or confused by improper reverberation. It is common practice in such studios to provide means which will absorb all sound impulses which may be reflected back to the pick-up device. The means, however, at present employed so completely absorbs reflected sound waves that an unnatural effect is produced within the studio and this unnaturalness is a more or less annoying or disturbing agent to the performers.

One object of this invention is to provide a studio of the character described wherein means are provided to render the sounds created within the studio, with aural naturalness to the performers.

Another object of this invention is to provide a studio of the character described wherein means are provided to give proper amplification to the sound impulses as they impinge on the pick-up device.

Another object of this invention is to provide, in a studio of the character described, upon the floor, ceiling and certain walls of the studio, means for absorbing certain sound waves to prevent a too prolonged reverberation.

A further object is to provide a studio as described, wherein the direct sound waves or impulses are suitably amplified to the pick-up device and means are provided to impart resonance to the said sound waves.

A further object is to provide a studio of the character described wherein ample provision is made for ventilation and the exclusion of extraneous noises.

These objects are attained by the means illustrated in the accompanying drawing, which form a part of this application and in which:

Figure 1 is a longitudinal section, on line 1—1 of Figure 2, of a studio embodying the principles of this invention.

Figure 2 is a plan view of same.

Figure 3 is a transverse section, on line 3—3.

Figure 4 is a detail view, in section, of a ventilating outlet in the ceiling of the studio.

Figure 5 is detail plan showing a section of a wall of the studio having a ventilating corridor around the walls of said studio.

Figure 6 is a longitudinal section of a studio showing a slight modification which will be hereinafter explained.

Figure 7 is a plan view of same.

All the illustrations are diagramatic inasmuch as no attempt is made to show any detail of construction.

Referring in more detail to the parts, 1 designates a room in which the surface of the floor and ceiling, 2 and 3 respectively, are constructed of or covered with a suitable sound absorbing material. One end wall 3′ and the two side walls 4 and 5 are in like manner constructed of or covered with suitable sound absorbing material.

The remaining end wall 6 of the room is constructed of a solid rigid material capable of sound reflection. The said latter wall is formed with a concave shaped recess having a smooth, approximately parabolic surface 7.

The floor 8 of said recess is also of rigid construction and is finished with a smooth sound reflecting surface.

Following the contour of said recess, but arranged a few inches therefrom is a shell 9 of suitable wood construction, which, with the wood floor 10, forms a performer's niche 11; the said shell and floor are capable of sympathetic vibrations.

The floor 10 of said niche 11, is raised, a few inches, above the rigid floor 8 to form an air space or chamber 12 which, with the air space 13 behind the shell 9, forms a resonating chamber, open at the ends 14 and 15.

A pick-up device 16, is placed at the approximate focal point to the parabolic shell.

The said niche 11, which will hereinafter be termed a sound-niche is not limited to the size of the end of the studio, but may be

the full width and height or smaller, depending upon requirements in practice.

The performer or performers are positioned within the said sound-niche where all sound impulses are created and propagated to the pick-up device which picks up direct waves and some of the reflected, amplifying waves from the parabolic surface of the sound-niche.

All sound waves which do not impinge upon the pickup device will pass on to the sound absorbing surfaces and no reflected sound waves other than those from the sound-niche will strike the pick-up.

The resonance imparted to the sound waves or impulses will give a greater degree of naturalness than has heretofore been possible.

The pick-up device may be rigidly mounted upon a rigid base block as 17 and the pedestal portion may be incased with sound absorbing material.

Openings 18, providing means of ingress and egress are provided and are shielded against sound ingress by means of partitions or walls 19 and 20 which are constructed of or are covered with a sound absorbing material and function as baffles to prevent the ingress of extraneous sounds and the egress of studio sounds.

An air outlet 21, (Figure 4), may be provided in the ceiling which leads to a chamber 22 having an outlet 23, and series of baffles 24 and 25 interposed between the outlets 21 and 23. The walls of said chamber and outlet passage 21 and said baffles 24 and 25 are constructed of or covered with suitable sound absorbing material.

A similar chamber having baffles properly insulated against sound reflection is provided at the air inlets which may be located at either side of the sound-niche as at 26 and 27, shown in Figure 3.

Other provision for ventilation may be provided by means of a corridor 28, (Figure 5), which may parallel one or more sides of the studio.

The said corridor leads from any point outside the studio to the studio entrance opening 18, and interposed between these two points are series of staggered partitions 29 and 30. The walls of the corridor and all of the baffles are constructed of or are covered with a sound absorbing material. A window 31 opening to the outer atmosphere may be provided in the said corridor.

In Figures 6 and 7 a modified form of sound shell is shown and is applicable to small studios.

In this form the sound niche has a straight back wall 31 and beveled ceiling and side walls 32 and 33, respectively. The floor, ceiling and walls of this modified sound-niche are constructed of resonating wood and the rigid walls of the recess around the sound-niche and the floor of same are finished with a smooth sound reflecting surface.

The illustrations show a rectangular room but a studio constructed along the lines herein set forth may be oval shaped or circular in plan, in which case the sound niche may be placed at any point in the wall. Further the ceiling may be boweled or of any desired shape or contour provided same is properly insulated against sound reflection.

Various modifications may be employed in this invention without departing from the spirit and scope of same and it is therefore not intended to limit said invention to the particular embodiments shown and described.

What is claimed:

1. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes, a compartment, the floor, walls and ceiling of which are damped against sound reflection, and a recess in said compartment, the floor, walls and ceiling of which have sound reflecting surfaces.

2. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes, a compartment, the floor, walls and ceiling of which are damped against sound reflection, and a sound-niche at one side of said compartment constructed to impart resonance to the sound impulses.

3. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes, a compartment, the floor, walls and ceiling of which are damped against sound reflection, a recess in said compartment capable of sound reflection, a sound-niche within said recess, the floor, walls and ceiling of said sound-niche being constructed of suitable resonating material and capable of sympathetic sound vibration.

4. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes, a compartment, having sound damped floor, ceiling and walls, a recess in said compartment having sound reflecting floor, walls and ceiling, a sound reflecting niche in said recess, and a resonating chamber around said sound reflecting niche.

5. The sound studio of claim 1, including an air inlet and air outlet connecting with air passages, and having baffles interposed in said air passages, the said sides of said air passages and said baffles being covered with sound absorbing material.

6. The sound studio of claim 2, including an air inlet and air outlet connecting with air passages and having baffles interposed in said air passages, the said sides of said air passages and said baffles being covered with a sound absorbing material.

7. The sound studio of claim 1, wherein

corridors are provided along one or more sides of said compartment, openings from the corridor to said studio and outside, staggered partitions forming baffles in said corridor; the said corridor and baffles being covered with sound absorbing material.

8. The sound studio of claim 2, wherein corridors are provided along one or more sides of said compartment, openings from the corridor to said studio and outside, staggered partitions forming baffles in said corridor; the said corridor and baffles being covered with sound absorbing material.

9. The sound studio of claim 1, including an air inlet and an air outlet connecting with air passages, and having baffles interposed in said air passages, the sides of said air passages and said baffles including sound damping material.

10. The sound studio of claim 2, including an air inlet and an air outlet connecting with air passages and having baffles interposed in said air passages, the sides of said air passages and said baffles including sound damping material.

11. The sound studio of claim 1, wherein corridors are provided along one or more sides of said compartment, openings from the said corridors to said studio and outside, staggered partitions forming baffles in said corridors; the said corridors and baffles including sound damping material.

12. The sound studio of claim 2, wherein corridors are provided along one or more sides of said compartment, openings from the said corridors to said studio and outside, staggered partitions forming baffles in said corridors; the said corridors and baffles including sound damping material.

13. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes comprising, a compartment having sound damped surfaces, a sound-niche in said compartment capable of sympathetic sound vibration, and means within the said compartment for picking up sound impulses originating in said sound-niche; the said sound damped surfaces of said compartment preventing reverberation of undesirable sound impulses originating in said sound-niche.

14. A sound studio for picking up and converting sound impulses for recording and radio broadcasting purposes comprising, a compartment having sound damped surfaces, a recess in said compartment having sound reflecting surfaces, and means within the said compartment for picking up sound impulses originating in said recess; the said sound damped surfaces of said compartment preventing reverberation of undersirable sound impulses originating in said recess.

In testimony whereof I affix my signature.

SOLOMON S. SUGAR.