

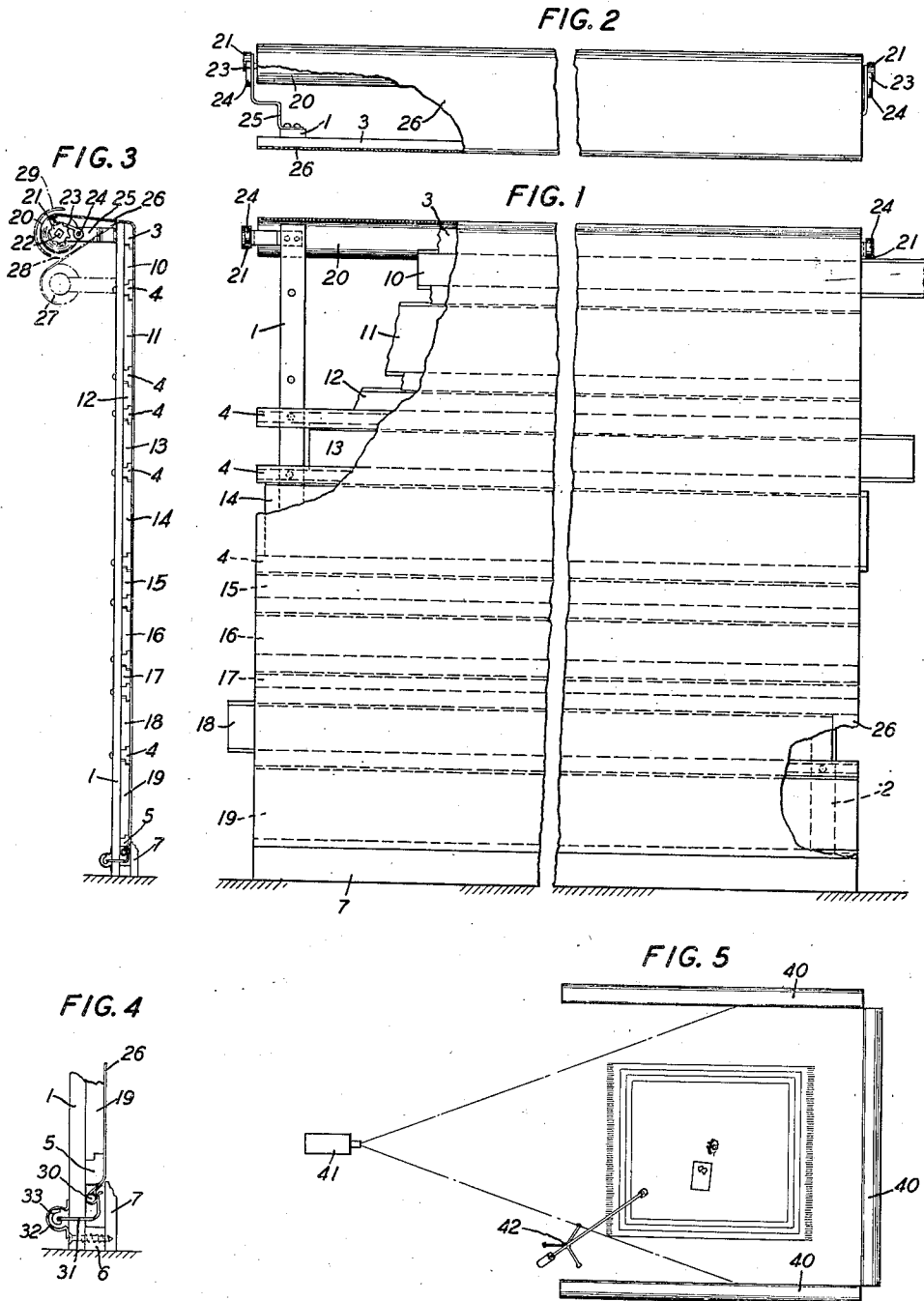
June 21, 1938.

F. L. HUNT

2,120,979

ACOUSTIC ELEMENT FOR SOUND STUDIOS

Filed June 14, 1935



INVENTOR  
F. L. HUNT  
BY  
G. H. Hunt  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,120,979

## ACOUSTIC ELEMENT FOR SOUND STUDIOS

Franklin L. Hunt, Summit, N. J., assignor to  
Bell Telephone Laboratories, Incorporated, New  
York, N. Y., a corporation of New York

Application June 14, 1935, Serial No. 26,573

5 Claims. (Cl. 181—30)

This invention relates to the science of acoustics and more particularly to the construction of walls and ceilings generally known as flats for sound picture studio sets.

5 In the control of acoustics of a studio set to obtain the illusion of reality, it is important that the recorded sound shall have a reverberant quality characteristic of the scene portrayed, and also that it shall appear to come from and follow  
10 the movements of the visible source on the screen. In order to create this illusion, it is necessary that the amount and character of the reverberation or reflected sound present shall be such that when recorded it will simulate the sound which  
15 would naturally be expected in a room or scene such as the one being photographed. The apparent movement of the sound source in the scene depends not only upon the distance between the sound source and the microphone, but also upon  
20 the proportion of direct and reverberant sound present. In general the more reverberation present, the greater is the apparent distance of the sound from the foreground. In view of these facts, it is important to be able to accurately  
25 control the reverberation characteristics of a sound picture studio set.

The design of acoustics of the set must be considered according to the scene being depicted. In many cases at the present time studio  
30 sets are especially constructed for recording various scenes in which special materials are placed together in such manner as to properly duplicate the acoustics of the natural scene.

In general, a standard flat consisting of boards  
35 covered with a selected material is used by recording companies. A large number of such equivalent flats are kept on hand to be used for the construction of any studio set required. In using flats of this character, the all-important  
40 factor of obtaining the correct amount of reflection or reverberation becomes extremely difficult and in a large number of cases a compromise is made.

It is therefore the object of this invention to  
45 provide sound picture studio set flats having a surface of chosen material and a framework backing for said surface material of removable panels to facilitate rapid adjustment of the sound reflecting or reverberating qualities of the studio set.

50 One embodiment of the invention resides in the manufacture of flats for studio set construction, made of removable panels of wood or a chosen composition which forms a continuous  
55 flat surface in conjunction with a framework.

The front or studio set side of the framework may be covered with a smooth, non-rigid material. This material may be made adjustable in order to produce a taut surface or semi-taut surface. Such flats can be erected for the construction of studio sets in the usual manner of erecting the ordinary flats now used by sound picture producing companies. When necessary, the facing material may be painted or otherwise decorated in harmony with the scene depicted and the necessary hangings placed on the framework. Either or both materials may be taken from rollers provided on this framework. The frequency absorption characteristics of studio set materials may be determined by well-known means and tests may be made in the usual manner for obtaining reverberation measurements. A chart may thus be prepared giving the reverberation measurements for sets of different sizes equipped with differing numbers and different sizes of panels. With such calculations at hand, the number of panels of given size to be used in the flats of a given set for a particular acoustic result can be readily obtained. A studio set having a particular amount of sound reflection or reverberation can thus be readily constructed without further tests by the removal of certain panels as indicated on the chart, before or after the flats are placed together.

The invention may be better understood from the following detailed description and the illustrated embodiment in which:

Figs. 1, 2, 3, and 4 show the construction of a studio flat according to the invention; and

Fig. 5 shows a simple three-flat studio set.

35 The sound reflecting property of a studio flat according to the invention is regulated by the number and size of the panels therein represented on the drawing by numerals 10 to 19, inclusive, and the material used as a facing for the flat. The facing material may be acoustically transparent or it may produce a desired acoustical effect. The panels are supported by cross-members of the type designated by numerals 3, 4, and 5 and by uprights such as 1 and 2. These panels are arranged to be placed in position between cross-members or removed to accurately provide the correct sound reflection or reverberation to simulate the effect of the sound reflection expected from the natural surroundings represented in the set. This effect may be accurately gauged and adjusted by the use of panels of various widths as shown. Any well-known locking devices may be used if desired for holding the panels in position when the flat is moved from  
55

one location to another. Any character of material may be fastened directly on the surface of the flat, or one or more roller curtain devices, such as **20** and **27**, may be used in conjunction with each flat for sound absorbing or reflecting materials and for depicting surroundings related to the scene. The rollers **20** and **27** may be in the form of a reel having a center rod or core upon which the material is wound. The rod or core may terminate in a ratchet such as **21** having a socket **22** arranged for the insertion of a crank for winding and unwinding material used for the facing of the flat. A pawl such as **23** pivoted to bracket **25** is operatively associated with the ratchet wheel **21**. This pawl may be placed out of engagement with the ratchet when the material is unrolled and carried downward over the surface of the flat. Fig. 4 illustrates one method whereby the material in the form of a curtain may be readily held in position at the bottom of the flat. In this embodiment, the material is fastened to a small rod or slat **30** which is placed in the spring-operated retainers with the base board **7** removed. The spring-operated retainers are fastened to the uprights **1** and **2** and comprise a casing **32**, spring **33**, and retainer **31** pivoted in the casing **32**. The retainer shown is of a size to accommodate two curtain rods between cross-member **6** and cross-member **5**. After the rods having the material fastened thereto are placed in position in the retainer, the base board **7** is fastened in position. The pawl **23** may then be brought into engagement with the ratchet and the material made as taut as required.

When a number of flats are placed end-to-end, to produce a long wall, the rollers may be staggered. That is, the odd numbered flats may be equipped with roller **20** and the even numbered flats with roller **27**. The roller **27** is the same as the roller **20** previously described. The material **28** from roller **27** is carried over the top of the flat as illustrated in Fig. 3. When two rolls of material are required for a flat, both

rollers **20** and **27** may be used and the material from the roller **27** carried over a guide extending around the roller **20**.

Each panel of a given size may have a known acoustical characteristic and each material used for a facing may have a known acoustical characteristic both derived from tests and charted. Consequently, a flat with a complete complement of panels or with a certain number of panels of certain sizes removed has a known acoustical characteristic. A reverberation chart may be made for all conditions anticipated so that the adjustment of the flats for a studio to meet a given condition is merely a matter of routine. A large saving is thus anticipated in the use of such flats for studio recording.

What is claimed is:

1. Acoustic element for a room comprising a frame, a plurality of supports mounted on said frame, and sound reflecting panels removably mounted on said supports.

2. Acoustic element for a room comprising a frame, a plurality of guiding supports mounted on said frame, and sound reflecting panels slidably mounted in said guides.

3. Acoustic element for a room comprising a frame, a plurality of supports mounted on said frame, sound reflecting panels removably mounted on said supports, and a covering for said sound reflecting surfaces.

4. Acoustic element for a room comprising a frame, a plurality of supports mounted on said frame, sound reflecting panels slidably mounted on said supports, a covering for said sound reflecting panels, and mounting means for removably securing said covering to said frame.

5. Acoustic element for a room comprising a frame, a plurality of supports mounted on said frame, sound reflecting panels mounted on said supports, a covering for said sound reflecting panels, and mounting means for removably and adjustably securing said covering to said frame.

FRANKLIN L. HUNT.