Sept. 20, 1932. W. H. MORRIS 1,877,941

TALKING PICTURE SCREEN

Filed Nov. 8, 1930

Fig. 1.

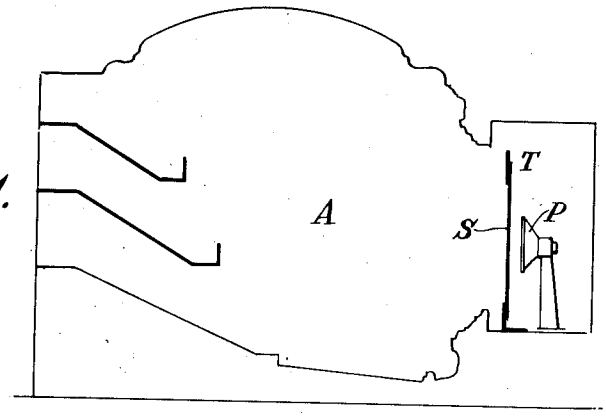


Fig. 2.

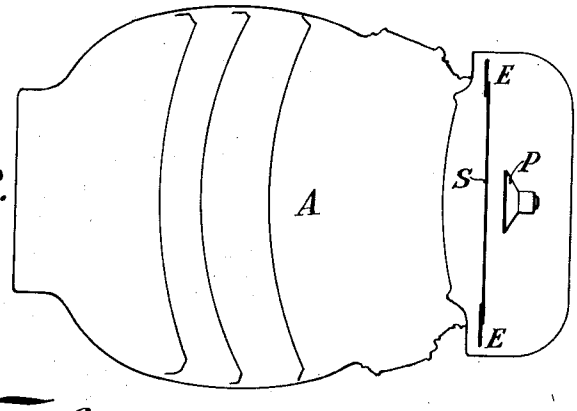


Fig. 3.

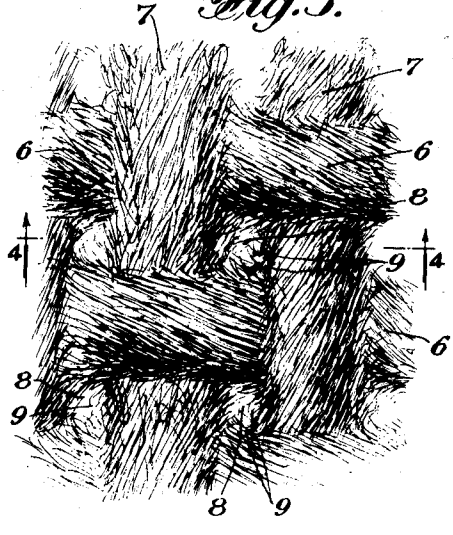
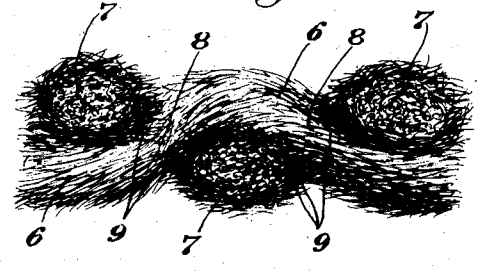


Fig. 4.



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UNITED STATES PATENT OFFICE

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TALKING PICTURE SCREEN

Application filed November 8, 1930. Serial No. 494,262.

This invention relates to screens for moving pictures, and particularly for the talking type of pictures in which the sound corresponding to the picture is reproduced behind the screen.

In such reproduction it is important to have the apparent point of origin of the sound correspond with the position of the speaker, and consequently it has been the practice to punch apertures through the screen sufficient in number to permit some of the sound to pass through it.

The object of this invention is to provide a screen of such construction as to permit the passing of the sound waves directly through it without the punching of apertures, and at the same time to have good light reflecting surfaces giving a clear bright picture.

In the accompanying drawing illustrating the invention

Fig. 1 is a diagrammatic sectional elevation of a screen positioned in an auditorium or audience chamber,

Fig. 2 is a diagrammatic plan view of Fig. 1,

Fig. 3 is a detailed face view of a portion of the screen of this invention shown on enlarged scale, and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

With the screen S positioned as shown in Figs. 1 and 2 between the speaker P and the auditorium or audience chamber A any reflection of the sound waves backward into the back stage areas or the carrying of large portions of the sound around the screen edges EE and top T will necessarily result in misalining the sound with the position of the pictures, and will also cause echoes and displacements resulting in reverberations and hollow unnatural tones in the reproduction. The most natural and pleasing distribution is to have the sound pass directly through the screen with a minimum of resistance and with little tendency to complicate the tones by back stage echoes. This becomes increasingly important as the size of the screen is enlarged, and with the large size of screen now proposed, sixteen feet in height and twenty four or thirty five feet in width, it is practically out of the question to attain a proper direction of the sound waves unless they are passed directly through the screen.

The screen S of my invention is composed of textile material so constructed and woven as to provide for the passing of the sound through the material of the screen. Figs. 3 and 4 show the structure comprising warp and filler threads 6 and 7 not over eighteen picks to the inch, for instance, and made of twenty eight cut yarn two ply both ways. Each thread or yarn is composed chiefly of an asbestos fibre spun with fifteen percent of long fibre cotton, such for instance as Sea Isle cotton.

The weaving is loose so as to keep the threads of yarn out of close contact with each other, and to provide the orifices or openings 8 between them. These orifices or openings are small in comparison with the long diameters of the strands of yarn 6, 7, and the yarn is loosely woven so as to provide protruding fibres 9 extending over and tending to cover and partially fill in the openings of each orifice 8.

These loose fibre ends 9, in effect form a nap which is distributed over the entire surface of the screen or curtain, and may be laid in more or less regular form over the openings by brushing so as to provide a multitude of light reflecting surfaces in the form of small brilliant lines over substantially the entire extent of the orifice. Consequently as observed by even the nearest of the audience, the surface of the screen is absolutely continuous, and there are no holes of visible size except upon very close inspection. In the example given for instance, the orifices 8 are less than three hundredths of an inch in their longest dimension, and are easily reached and substantially hidden by the fibers 9. In manufacture the yarn is first spun with the cotton and asbestos fibres twisted quite compact and tight, and then the subsequent weaving tends to open up and loosen the fibres, particularly those of the asbestos to form the loose ends 9 providing the nap. After weaving the material is preferably calendered by passing between rollers under pressure

tending to flatten out the yarn into more or less oval form in section at the crossing points as shown in Fig. 4. The two sides of the material in finished condition are substantially identical so that either face may be used as the light reflecting face, or after using one face the other surface may be turned to the light if desired because of any wear or injury to the first surface used.

The screen or curtain is hung vertically as shown in Figs. 1 and 2 between the reproducer and the audience, and acts to reflect the light from the projector (not shown) at the front of the screen with great efficiency while at the same time passing the sound from the speaker P easily and directly through the multitude of orifices 8 over the entire screen. Each of these orifices 8 has the surrounding walls 6, 7 of relatively tightly twisted mineral fibres, asbestos, and is partly covered with the nap of loose mineral fibres 9, these fibres being brightly white and light reflective. I find that sound passes readily through such orifices while at the same time the nap fibres give a substantial continuous light reflection. Consequently, the sound is directly passed with very little diminution while the front surface of the screen gives a very efficient reflection of the light from the projector. The orifices 8 are sufficiently open to be light as well as sound transmitting and when the material of the screen is held close to the eye of the observer objects may be discerned through these orifices as through a multitude of pin holes.

The distribution of the nap fibres at different depths within the orifices 8 brings the light reflecting lines of the fibres in mesh relation with the deeper fibres 9 reflecting the light passing through the other front fibres at the surface, and thus provide light reflection from a series of successive surfaces at different depths.

The fibres of the mineral asbestos do not change with age, and are permanently white and highly reflective, so that the surface of the screen is readily renewed by simple brushing to remove any accumulated dust, and at the same time this brushing will redistribute the nap of fibres over the sound transmitting orifices.

I claim:

1. A moving picture screen adapted to transmit sound and reflect light and comprising woven threads of asbestos fibres spaced to provide orifices between them, and having outer fibres of said threads extending over and tending to cover and partially fill said orifices to form a plurality of light reflecting surfaces theren while permitting sound waves to pass therethrough.

2. A screen for talking pictures composed of woven fabric comprising strands of asbestos fibres combined together to provide a large number of small orifices distributed over the screen and adapted to pass sound waves therethrough, and relatively loose fibres forming a nap adapted to extend across said orifices to provide reflective surfaces so as to reflect light without substantial interference with the transmission of the sound through said screen.

3. A talking picture screen composed of strands of asbestos fibres woven together to leave scattered orifices through said screen, said orifices being of less width than the width of said strands, and means forming reflective surfaces in said orifices adapted to reflect light without substantial interference with the passing of sound.

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