This invention relates to means for minimizing or eliminating transmission of sound into rooms or buildings through opened or partly opened windows or passages and for preventing passage of sound from one section or zone in a room or building to another.

It is an object of the invention to provide a screen, blind or the like with improved noise eliminating means which will allow the passage of air or light or both, but will subdue or practically eliminate sounds attempting to pass therethrough.

Other objects of the invention will appear as it is described in connection with the accompanying drawings.

The invention is applicable to screens, movable partitions, blinds, drops and the like.

When used to prevent transmission of noise into a room from outside or elsewhere, the invention is applied as a screen or blind adjacent a window or door, leaving multiple ventilating passageways or openings there-through for free movement of air while the sound is subdued or filtered out by deflection or interference as hereinafter described.

In the drawings:

Fig. 1 is a perspective view of an invention as applied to a window.

Fig. 2 is an elevational section view taken along line 2—2 of Fig. 1.

Fig. 3 is a detail perspective view partly broken away of a series of vertical members embodying the invention as used in Fig. 1.

Figs. 4, 5, 6 and 7 individually used, are similar to Fig. 3 but different forms of horizontal members.

Referring to the drawings, the invention is shown in Fig. 1 as applied to a window casing 10 having upper and lower vertically movable slats. The invention comprises a plurality of parallel horizontal members, designated generally by the numeral 60, mounted in spaced relation vertically upon a pair of vertically parallel horizontally spaced supports 12 and 14. The supports may be rigid or flexible and may be wooden, metal or plastic strips or may be tapes of cloth or other fabric or flexible material. If cloth is used, the horizontal members may be mounted thereon and attached thereto like Venetian blind slats. If strips are used, the connection between the strips and the horizontal members may be rigid (as by nailing or riveting) or hinged (as by hooks and eyelets or staples) to permit the tilting of the horizontal members. Since the mounting means per se is an incidental feature to which the invention is not limited, it need not be further elaborated.

The supports, if rigid, may be either on one side or the other of the screen, or on both, as is necessary with cloth.

In a form illustrated in Fig. 3, the individual horizontal members 20 may be thin long narrow slats 26 from the top and bottom surfaces of which extend a plurality of longitudinal parallel vertical ribs 22, 24 of generally rectangular form in cross section. The horizontal slat portion 26 may be formed integrally with the ribs so that the members, when formed of wood, can readily be shaped in conventional woodworking machinery; or if made of metal or plastic, they can be extruded or otherwise formed by conventional metal working tools or molds.

In Fig. 4, the upwardly and downwardly extending portions 32 and 34 of the ribs may be inclined in the same direction so as to diverge from their juncture with the horizontal midportion 36.

In the form of Fig. 5, the ribs 42, 44 are shown to be curved or of arcuate cross section, curving in the same direction from the horizontal portion 46.

In the form of Fig. 6, the ribs 52, 54 are similar to Fig. 4 except that the ribs on one side are staggered relative to the ribs on the other, instead of being aligned as in Fig. 3.

When staggered, it is possible for ribs of one member to fit in the channels of the member below if the members should be mounted and collapse like a Venetian blind.

In Fig. 7, a series of narrow thin slats 61 are parallel and extend across the width of the window in vertical or substantially vertical planes or, as shown, they may be curved and parallel. The vertical dimension of these slats is small as compared to the horizontal dimension of the whole series of horizontal members 60. To hold the slats together, they may be secured at each end by a horizontal securing strip 66. The attachment may be by forcing the slat ends into slots cut into the strips or the slats and strips may be cast or molded or otherwise integrally formed as a unit, or welded to the strips.

A convenient means of mounting the device in a window may comprise hooks 16 on the top ends of the supporting strips 12 and 14 in position to hook over handles 18 on the lower horizontal ram of the bottom window sash.

Where no such handles exist, the whole device may be held in the window opening frictionally by pushing the bottom sash down on the top of the device while the bottom thereof rests in the recess usually occupied by the bottom rail of the bottom sash when the window is closed.

Alternatively, any other conventional means may be provided to hold the device in the opening through which the noise would come.

In all the described forms, the horizontal members or units which make up the screen will be seen to have channels between the ribs or slats, the sides of which have substantially straight surfaces as viewed in cross section. It will usually be commercially more practical to have those sides straight throughout the length of the unit, e.g., across the window, but the invention is not limited in the respect, nor to ribs having plane top surfaces and plane bottoms in the channels. It is desirable however for the channels to be relatively deep and narrow and numerous in order that sound waves which may come from many different directions, attempting to pass through the device, will tend to strike against the ribs and be reflected in many different directions causing interference, and thus neutralizing and subduing the noise by reducing it to a low level. The loud sound waves thus are filtered out or substantially eliminated. With the ribbed slats, sound waves that contact the ribs from either above or below, are deflected against the slats or against the side walls of adjacent ribs in repetitious continuity. In such a manner, sustained passage of sound waves through or between the slats is interrupted and prevented. The sloping or curving of the ribs towards the incoming sound tends to cause refraction of the sound waves, thus to prevent their entering into the room or to the space on the opposite side of the screen.

Whether the sound waves are reflected outwardly in
the direction from whence they came or are reflected so as to interfere with one another and with incoming waves, the effect is always to neutralize, subdue and substantially eliminate noise which would otherwise enter the room or pass through the screen. Nevertheless, the passage of light and air can continue through the space between the several horizontal members or slats so as to permit ventilation and lighting of the room from the outside.

The invention as described above and as illustrated in the drawings is applied to horizontal members in which form it will find a wide field of use. However, the invention is not limited to members arranged horizontally in a vertical plane but may be applied to parallel members which are directed vertically or at any angle to the horizontal in a vertical or approximately vertical plane. Generally speaking it is not material whether the members are supported from above or below.

Many other variations within the scope of the invention will occur to those skilled in the art. Therefore, the invention is not limited to the specific dimensions and detail described and illustrated.

What is claimed is:

1. A noise suppressing screen adaptable to placement in room openings to suppress sound waves tending to pass therethrough while directly admitting light and air, comprising a plurality of parallel horizontal members, means supporting said members in vertical arrangement spaced apart to directly admit light and air, the upper and lower faces of each member having laterally spaced upwardly and downwardly directed surfaces extending longitudinally along said members forming upwardly and downwardly directed passageways, said passageways having their surfaces inclined outwardly toward incoming sounds to cause interference, reflection back and suppression of sound waves impinging upon one side of the screen, and said horizontal members being of length approximating the width of the opening in which the screen is to be placed.

2. A screen as claimed in claim 1 in which the upwardly and downwardly directed surfaces are formed by vanes joined together at their ends.

3. A screen as claimed in claim 2 in which the upwardly and downwardly directed surfaces are curved outwardly.

4. A screen as claimed in claim 1 in which the upwardly and downwardly directed surfaces are curved outwardly.

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