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SOUND ARRESTER IN THE VENTILATOR
OF SOUND-ARRESTING ROOM
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FIG. 1

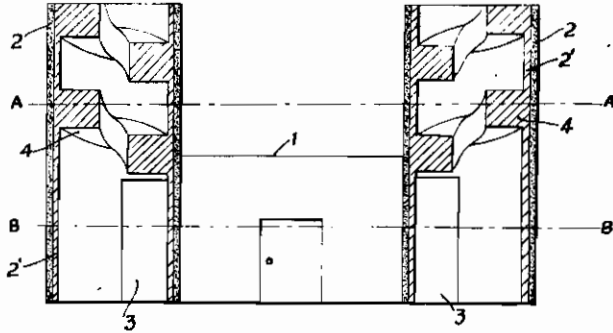


FIG. 2

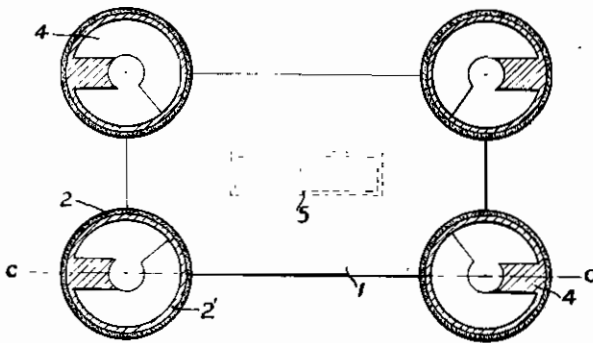


FIG. 4

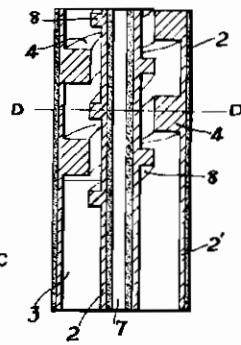


FIG. 3

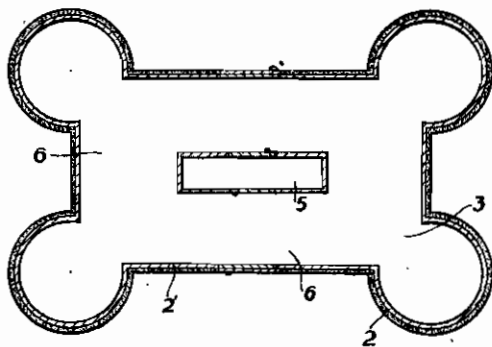
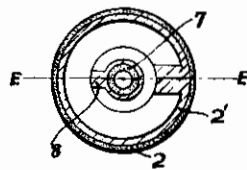


FIG. 5



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SOUND ARRESTER IN THE VENTILATOR OF SOUND-ARRESTING ROOM

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This invention relates to a sound-arresting structure consisting in the feature that the inner surface of the cylindrical ventilator in the sound generating room is all covered with a sound-arresting material, having, on the inner surface of the upper portion of the ventilator, a female screw shaped sound-absorbing wall projected inwardly, so as to eliminate sound waves in advancing them spirally.

The object of the present invention is to manufacture economically a sound-absorbing apparatus which completely prevents sounds from flowing outside the room.

There have generally been used at the mouth of ventilator on the roof, in order to eliminate sounds flowing out of the ventilator of the sound generating room, the same sound arresters as those used on the floor of doorways, which mostly required reinforcement works enough to support their weight. In particular, when such sound arresters are shaped unsuitable for their use on heights, a special ventilator suitable to such arresters should be built at an extra cost, which has put users to a great inconvenience.

The present invention is, with object of removing the foregoing defects, provided, on the roof or flank of the sound generating room, with one or more cylindrical ventilators each having, on the inner surface, a spirally projecting sound-absorbing wall whereby the ventilating cylinder is rather reinforced and whereby the absorption of sounds and spiral run of the air current are effected favorably.

The construction of the invention is illustrated in the accompanying drawing, in which

Fig. 1 is an elevation of sound generating room provided with the sound-absorbing apparatus according to the present invention partly showing a sectional elevation along a line C—C of Fig. 2.

Fig. 2 is a sectional plan along a line A—A of Fig. 1.

Fig. 3 is a sectional plan along a line B—B of Fig. 1.

Fig. 4 is a sectional elevation along a line E—E of Fig. 5 in case two paralleled spiral walls are provided.

Fig. 5 is a sectional plan along a line D—D of Fig. 4.

These figures illustrate the present invention by two examples. As regards the sound-arrester at the mouth of ventilator shown in Figs. 1, 2 and 3, there are provided, at the four corners of the sound-arresting room 6 in which such noisy sound generator as machinery, engine, propeller for trial or talkie filming projector is held, with cylindrical

ventilators 2 erected on the floor and passing through the roof, each ventilator being cut away, in its inner part facing the room 6, to an air-inducing opening 3. All over the inner surface of the said ventilating cylinder, a sound-absorbing plate 2' is pasted, and, in the upper part of the cylinder i. e. in the part above the ceiling of the room, is provided, on its inner wall, with a female screw shaped sound-absorbing wall 4 projecting inwardly at a height of about a third the diameter of the cylinder. The length of the said screw shaped sound-absorbing wall is limited to a round or, if necessary, to two or three rounds. If the pitch of the screw shaped wall is steep, the ventilation is good, because the number of the wall rounds is small, but chances of repeated sound absorptions reduce. If the pitch is gentle, the absorption of sounds is complete, but as the number of the wall rounds increases the ventilation is obstructed proportionally. The pitch and number of rounds in the said screw shaped sound-absorbing wall are therefore to depend on the strength of the sounds coming from the sound generator.

A sound observation room 5 is built at the middle of the sound-arresting room 6, and, around the room 5, is placed a sound generator the sounds generated therefrom being observed by the observers in the room 5.

As one of the modifications of the present invention, shown in Figs. 4 and 5, a column 7 having on its circumference a male screw shaped sound-absorbing wall 8 with the same pitch as that of the abovementioned female screw shaped wall 4 is set up coaxially in the said female screw shaped sound-absorbing wall 4. In this apparatus, as two spiral sound-absorbing walls lie alternately and doubly in the ventilating cylinder, the effect on arresting sounds is far better than the case when a single wall is used.

As the present invention is in the foregoing construction, sound waves coming from the sound generator in the sound-arresting room 6 are induced to the air-inducing opening 3 directly or after reflection from the wall, floor and ceiling of the sound-arresting room 6, and the sounds of short wave-length are partly absorbed and eliminated by the sound-absorbing wall 2' in the cylinder. The remaining sounds first collide with the lowest slant of the screw shaped wall 4, and thereafter, repeating reflection between the slant walls facing each other, the sounds are repeatedly absorbed and completely eliminated.

The sounds of long wave-length difficult of elimination effect various reflections in various

directions between the said slant screw-shaped walls and create sufficient phasic differences among the sound-waves, in consequence of which the sounds are eliminated completely after their mutual interferences.

In the present invention, the passage for various sounds of long and short wave-length is, as abovementioned, spirally extended in order to effect complete sound-eliminating operations in specially complicating the reflection of the sounds in the said spiral passage, and, in addition thereto, it is free from obstruction to the ventilation, and hence the present invention can be used more effectively than those hitherto used.

In case the mouth of the ventilator is opened in the side-wall of the sound-arresting room, the ventilating cylinder having the foregoing screw shaped sound-absorbing wall on the inner wall may be disposed horizontally. The ventilating cylinder having similar spiral wall may also be constructed on the ceiling instead of on the floor. The use of sound current regulators at the entrance of the ventilating cylinder makes the present invention more effective. The number and diameter of the said ventilating cylinder depend upon the area of the sound-arresting room and kinds of sounders.

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