E. B. FREEMAN.

VENTILATOR.

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990,536. Patented Apr. 25, 1911.

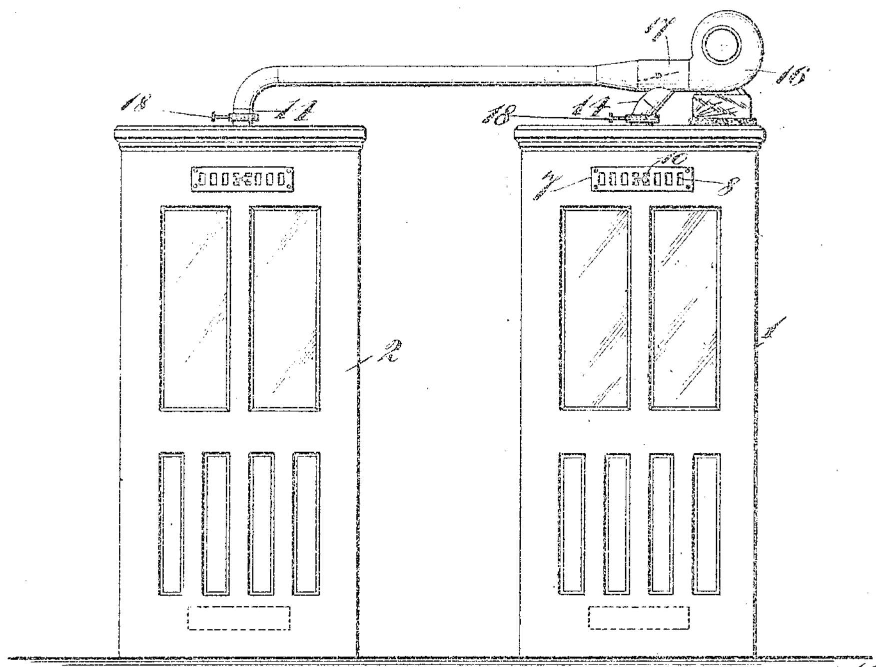

Fig. 1.

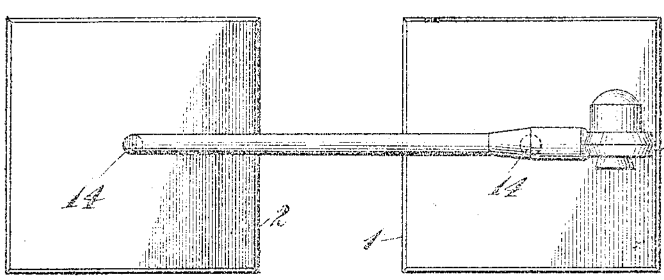

Fig. 2.

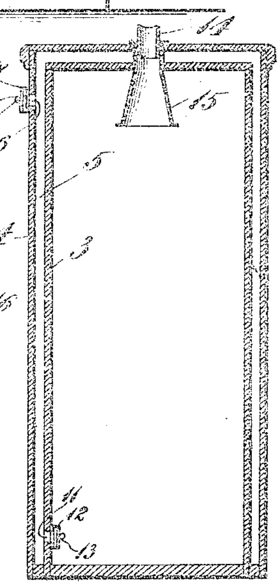

Fig. 3.

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VENTILATOR.

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To all whom it may concern:

Be it known that I, ERNEST B. FREEMAN, a citizen of the United States, residing at Dedham, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to apparatus for ventilating telephone booths.

It is desirable that telephone booths should be substantially noise-proof, so that the conversation of the occupant may be unintelligible outside the booth, and so that the occupant may not be disturbed by outside noises. For this reason these booths are usually provided with double walls and doors separated by a dead air space. While this construction renders the booth substantially noise-proof, it also effectively cuts off all communication with the outside air, so that when the door of the booth is closed the interior quickly becomes uncomfortably hot and oppressive.

It is the object of the present invention to provide for the ventilation of such booths without rendering the conversation of the occupants intelligible outside the booth or admitting outside noises to disturb him.

To this end the invention contemplates providing a telephone booth with ventilating air passages or openings constructed and arranged to change the velocity and direction of the air, and also providing means for causing a flow of air through the passages and the booth either by forcing air into or exhausting air from the booth. By the change in the velocity and in the direction of the flow of the air passing through the ventilated openings or passages, the sound waves are broken up or caused to interfere with and neutralize each other so that conversation inside the booth is either inaudible or unintelligible outside the booth, and outside noises are practically inaudible in the booth. The specific construction and arrangement of the ventilating openings or passages by which the velocity and direction of the air is so changed as to modify and break up the sound waves, is not material to the invention in its broader aspects. In embodying the invention in the usual form of telephone booths it is preferred, however, to provide the inner wall with one or more ventilators having restricted openings for the passage of the air, and to provide the outer wall with one or more of such ventilators arranged out of line with the ventilator or ventilators in the inner wall, and it is also preferred to provide for the circulation of air through the booth and ventilators by forcing air into the booth. The ventilators are preferably provided with means for varying the area of the openings through which the air passes in accordance with the rate at which the air is forced into or drawn from the booth to secure the requisite change in velocity, or to entirely close the openings in case the booth is not being ventilated.

The various features of the invention will be readily understood from an inspection of the accompanying drawing, in which—

Figure 1 is an elevation showing two telephone booths embodying the present invention in its preferred form; Fig. 2 is a plan view of the booths; and Fig. 3 is a sectional elevation.

As shown in the drawing, the two telephone booths 1 and 2 are provided with the usual inner walls 3 and outer walls 4 separated by the air space 5. The outer wall of each booth is provided, preferably near its top, with a ventilating opening 6. A ventilator plate 7 is secured over the opening, and this plate is provided with a series of holes 8 through which the air space 5 communicates with the outer air. The ventilator plate 7 is provided with a slide 9 having openings therethrough corresponding to the openings 8, and this slide is retained by the plate so that it may be adjusted to close the openings 8 or to vary their open area as desired. For the purpose of adjustment, the slide is provided with a handle 10 projecting through a slot formed in the plate 7.

The inner wall 3 of the booth is provided, preferably near the floor of the booth, with a ventilating opening 11. The ventilator plate 12, similar to the ventilator plate 7, is secured over this opening, and is provided with holes similar to the holes 8, the open area of which may be adjusted by means of a slide 13 similar to the slide 9.

Air is forced into the interior of the booth through a pipe 14, the inner end of which communicates with a diffuser 15, so con-

structed that it tends to diffuse and distribute the air forced in through the pipe 14. In the apparatus shown, the means for forcing air through the pipes 14 into the interior of the ventilators 1 and 2 consists of a small electrically driven fan 16, the discharge pipe of which communicates with the pipe 14. A damper 17 may be provided for cutting off communication with the pipe leading to the booth 2, in case it is desired to force air only into the booth 1, or may be set at any desired angle to properly distribute the air to the different booths. The pipes 14 are also provided with shut off slides 18 which may be closed when the fan is not running, to prevent the sound waves passing out through these pipes.

When air is forced through the pipe 14 it is distributed by a diffuser 15 and raises the pressure within the interior of the booth slightly above the pressure of the outside air. The air therefore flows from the interior of the booth into the air space 5 through the openings in the ventilator 12. Owing to the restricted area of these openings, the air passes through the openings at a velocity which is high compared to the flow of air through the interior of the booth, and also high as compared with the flow of air through the air space 5. The air passing into the air space 5 raises the pressure within this space so that there is a flow of air from the space through the openings in the ventilator 7. Owing to the restricted area of these openings, the air passes through them at a comparatively high velocity. Owing to the large area and volume of the air space 5, and to the arrangement of the ventilators 7 and 12 out of line with each other, there is little movement or flow of the air through the air space compared with the movement or flow of the air in passing through the ventilators. The velocity and direction of flow of the air is therefore changed as the air passes from the interior of the booth into the air space 5, and the velocity and direction of flow of the air is again changed as it escapes from the space 5 into the atmosphere. The sound waves are consequently effectively broken up or so modified that they neutralize each other, and little or no sound escapes from the interior of the booth or is admitted from the outside to the interior of the booth through the ventilating openings.

By adjustment of the slides 9 and 13, the ventilating openings through the walls of the booth may be entirely closed when the booth is not being ventilated, so that it will be as noise-proof as it would be if the ventilating device were not present. Whenever the booth is to be ventilated, the slides may be adjusted to vary the area allowed for the escape of the air in accordance with the amount of air being supplied by the fan, so that the requisite variation in the velocity of the outgoing air may be secured under varying conditions.

Substantially the same construction may be utilized in ventilating the booth by exhausting or drawing air from the booth. In this case the fan will be connected with the pipes 14 so as to draw air from the booths and thus cause the pressure within the booths to fall slightly below the pressure of the outside air and induce a flow of air into the booths through the ventilators and air space between the walls of the booths. In this case the velocity and direction of flow of the incoming air will be so changed as to effectively break up or so modify the sound waves that they will neutralize each other.

While the ventilation of the booth may be secured by either forcing air into the booth or drawing air from the booth, it is preferred to force air into the booth, since in securing ventilation in this way the diffuser acts to distribute the inflowing air and secure a cooling effect upon the occupant which is not secured in case the ventilation is secured by drawing air from the booth.

In either case the variation between the pressure in the booth and the pressure of the outside air is not great enough nor are the vibrations of the air currents sufficiently strong to affect the transmitter so as to cause a rumbling or objectionable noise at the other end of the telephone.

While it is preferred to employ the construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential except so far as specified in the claims, and may be varied and modified without departing from the broader scope of the invention.

Having set forth the nature and object of the invention, and specifically described one form of apparatus in which it may be embodied, what I claim is:—

1. A telephone booth provided with inner and outer walls separated by an air space, an air inlet communicating with the interior of the booth, the inner wall adjacent the end of the booth opposite that through which the air inlet passes being provided with openings, the outer wall being also provided with openings remote from the openings in the inner wall, whereby a substantial inclosed air space extending transversely to the openings intervenes between them, and means for causing a flow of air through said inlet, the interior of the booth and the air space between the openings in the inner and outer wall.

2. A telephone booth provided with inner and outer walls separated by an air space, an air inlet communicating with the interior of the booth, the inner wall adjacent the

end of the booth opposite that through which the air inlet passes being provided with openings, the outer wall being also provided with openings remote from the openings in the inner wall, whereby a substantial inclosed air space extending transversely to the openings intervenes between them, and a blower connected to the air inlet for causing a flow of air through said inlet, the interior of the booth and the air space between the openings in the inner and outer walls.

3. A telephone booth provided with inner and outer side walls separated by an air space, an air inlet communicating with the interior of the booth through the roof thereof, the inner wall of the booth adjacent the floor being provided with openings, the outer wall being also provided with openings remote from the openings in the inner wall, whereby a substantial inclosed air space extending transversely to the openings intervenes between them, and means for causing a flow of air through said inlet, the interior of the booth and the air space between the openings in the inner and outer walls.

4. A telephone booth provided with inner and outer walls separated by an air space, an air inlet pipe extending through the roof of the booth and being provided with an air diffuser within the booth, the inner wall adjacent the floor of the booth being provided with openings, the outer wall being also provided with openings remote from the openings in the inner wall, whereby a substantial inclosed air space extending transversely to the openings intervenes between them, and means for causing a flow of air through said inlet pipe, the interior of the booth and the air space between the openings in the inner and outer walls.

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