181-198 SR
FIP8110 XR 1,948,755

Feb. 27, 1934. O. GULLICKSEN 1,948,755

TELEPHONE BOOTH

Filed Feb. 6, 1931 5 Sheets-Sheet 1

Fig. 1.

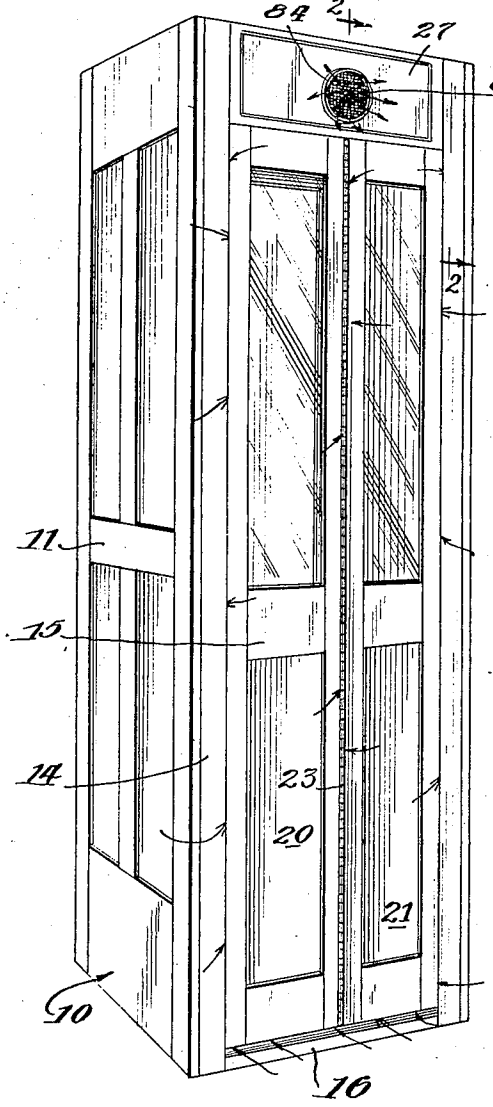


Fig. 5.

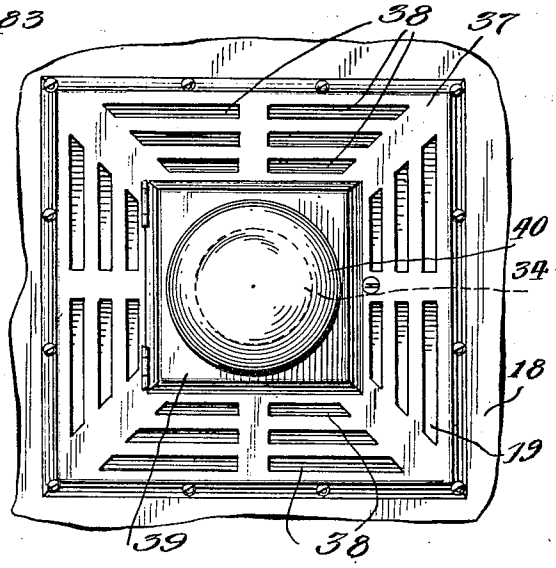
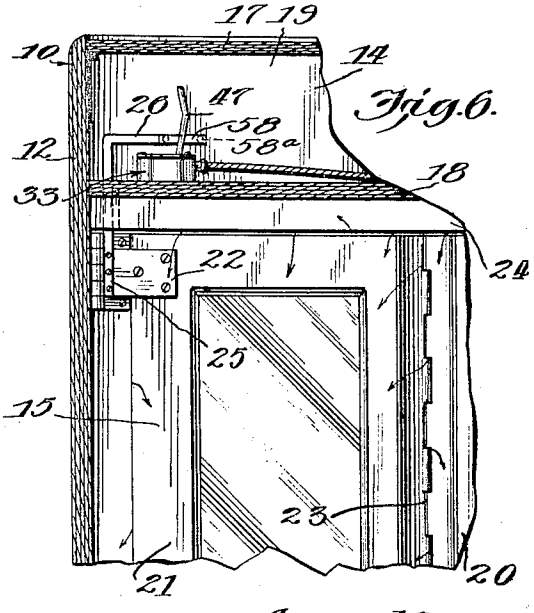


Fig. 6.



Inventor:
Ole Gullicksen
By Williams, Bradbury,
McCaleb & Hinkle.
Attys.

Feb. 27, 1934. O. GULLICKSEN 1,948,755

TELEPHONE BOOTH

Filed Feb. 6, 1931 5 Sheets-Sheet 2

Fig. 2.

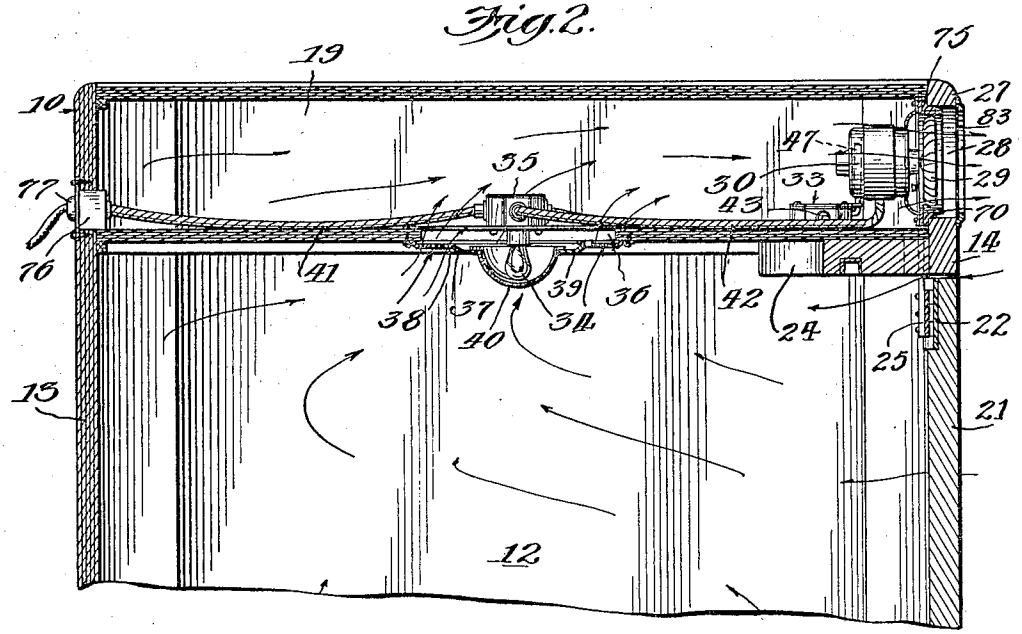
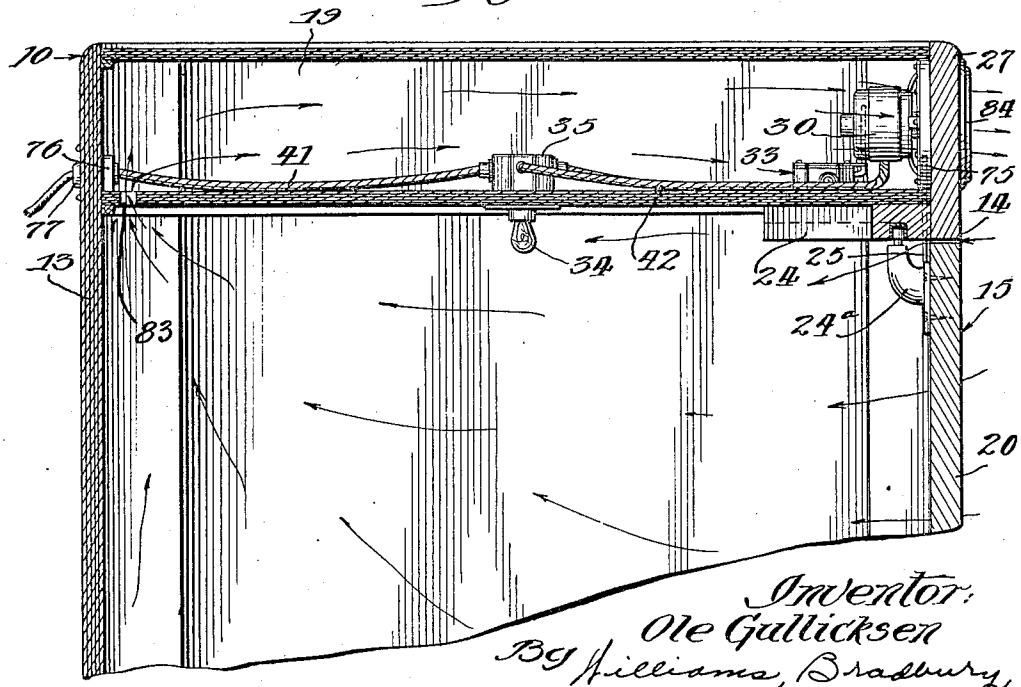


Fig. 3.



Inventor:
Ole Gullicksen
By Williams, Bradbury,
McCaleb & Hinkle.
Attys.

181-69

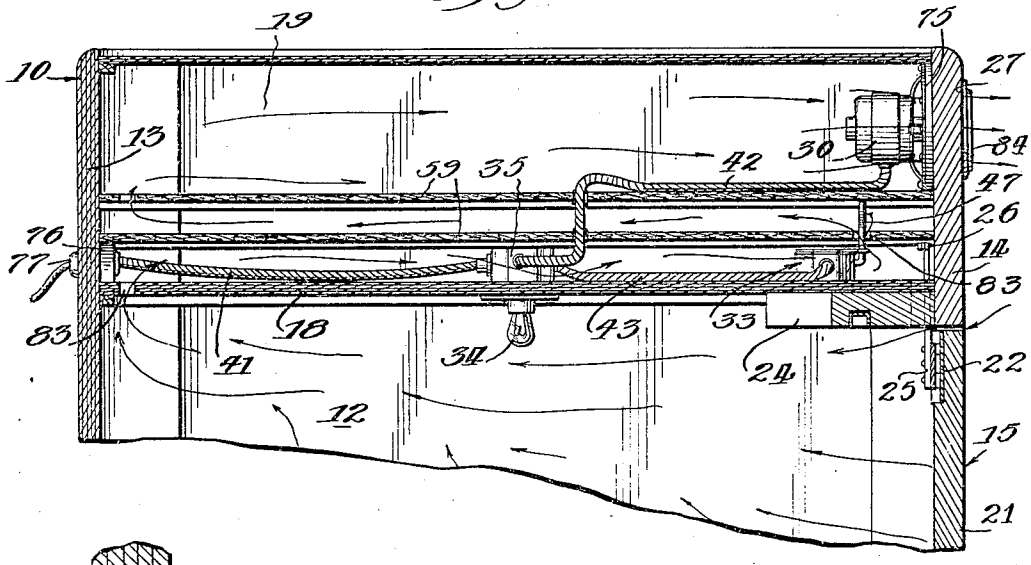
copy in 181-53

Feb. 27, 1934. O. GULLICKSEN 1,948,755

TELEPHONE BOOTH

Filed Feb. 6, 1931 5 Sheets-Sheet 3

Fig. 4.



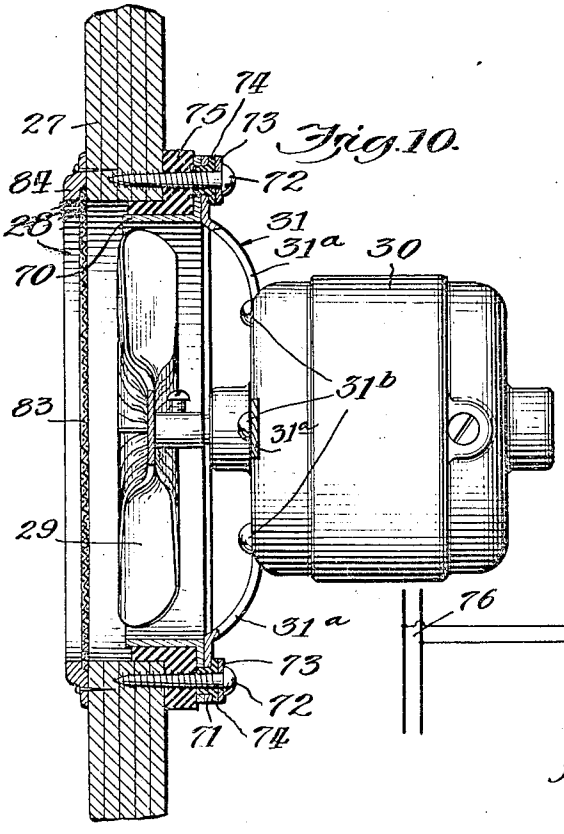
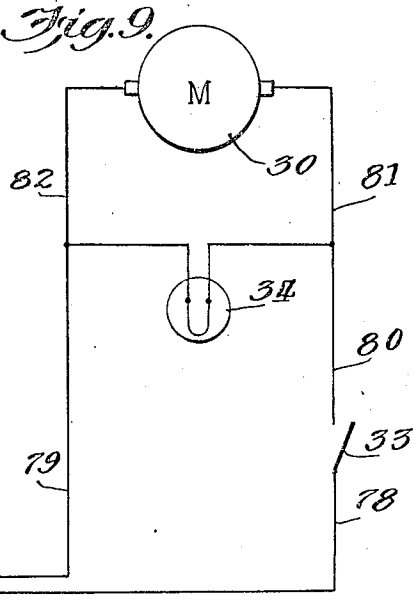


Fig. 10.

Fig. 9.



Inventor:
Ole Gullicksen
By Williams, Bradbury
Mc Caleb & Hinkle
Attys.

Feb. 27, 1934. O. GULLICKSEN 1,948,755

TELEPHONE BOOTH

Filed Feb. 6, 1931 5 Sheets-Sheet 4

Fig. 7.

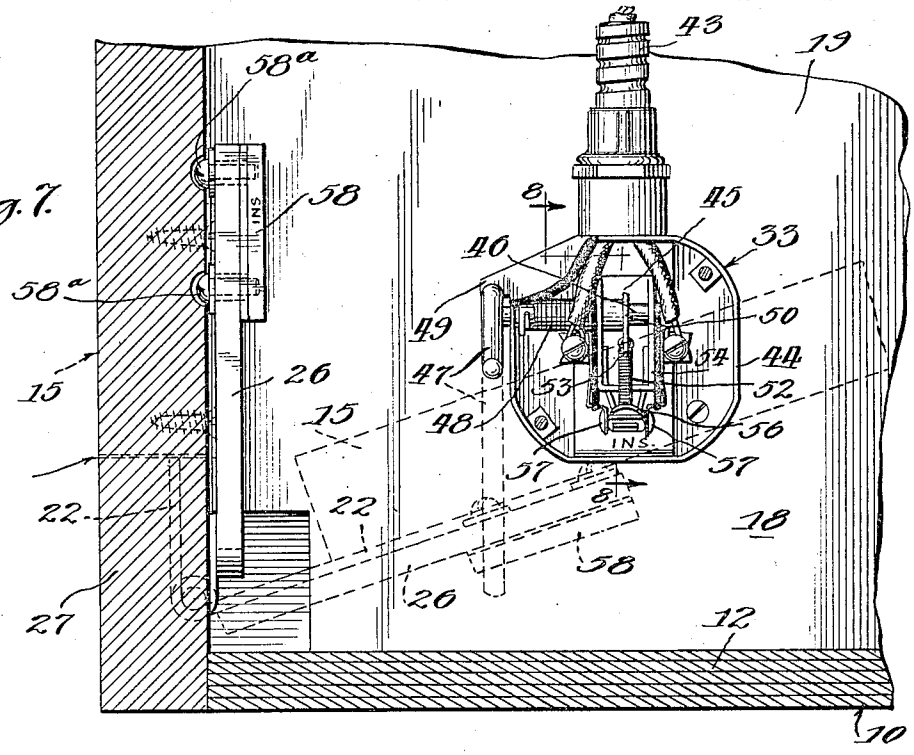


Fig. 11

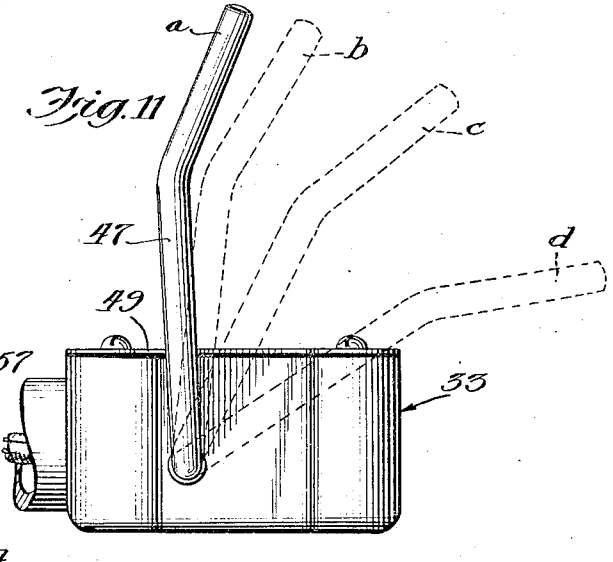
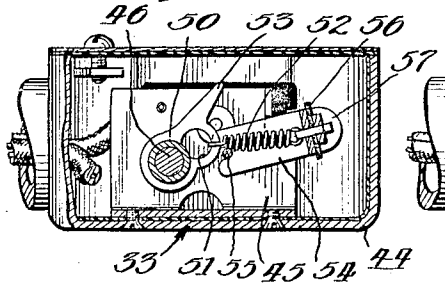


Fig. 8



Inventor:
Ole Gullicksen
By Williams, Bradbury
Mc Caleb & Hinkle
Attys

Feb. 27, 1934. O. GULLICKSEN 1,948,755

TELEPHONE BOOTH

Filed Feb. 6, 1931 5 Sheets-Sheet 5

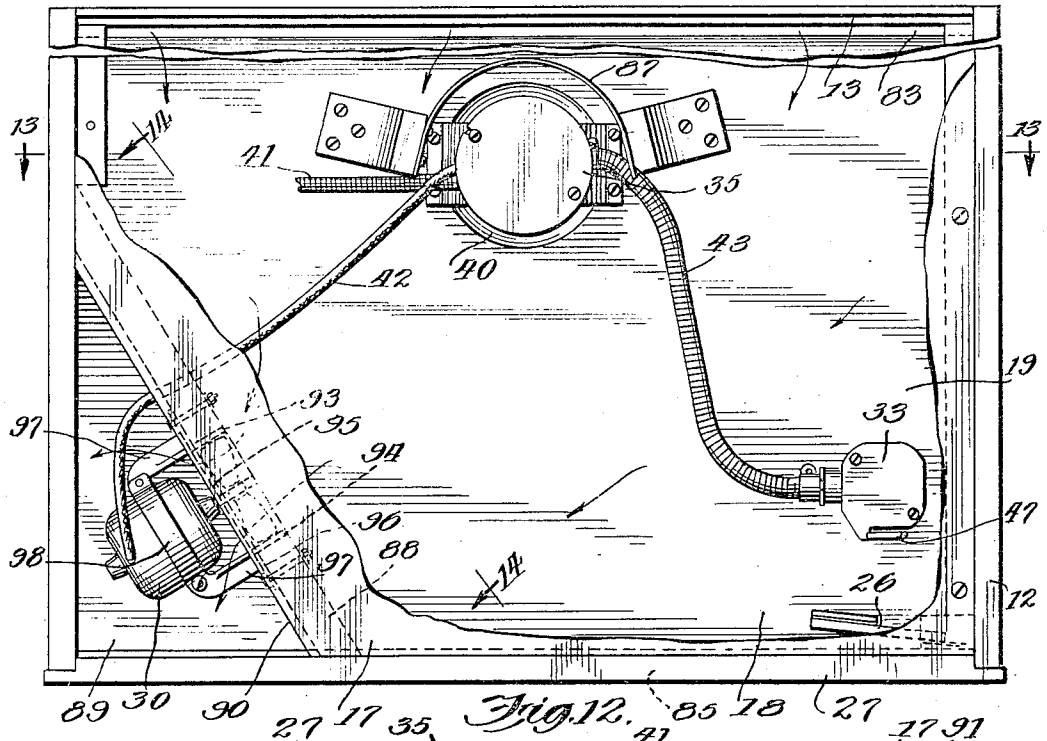


Fig. 12.

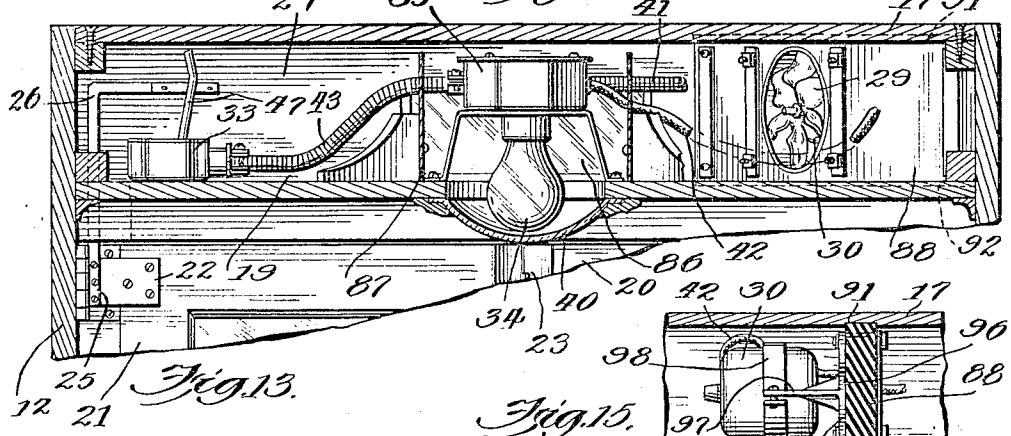


Fig. 13.

Fig. 15.

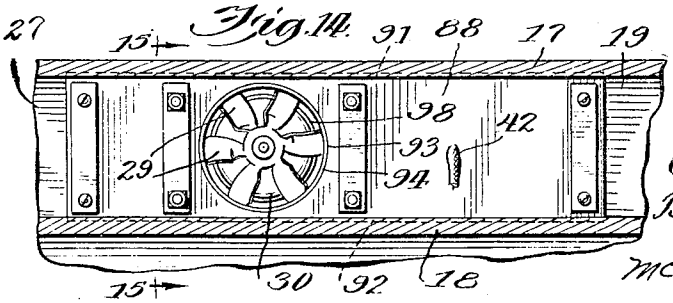


Fig. 14.

Inventor:
Ole Gullicksen
By Williams, Bradbury,
McCaleb & Hinkle.
Attys

Patented Feb. 27, 1934 1,948,755

UNITED STATES PATENT OFFICE

1,948,755

TELEPHONE BOOTH

Ole Gullicksen, Chicago, Ill., assignor to Churchill Cabinet Company, Chicago, Ill., a corporation of Illinois

Application February 6, 1931. Serial No. 513,966

3 Claims. (Cl. 20—3.5)

This invention relates to telephone booths, and is particularly concerned with improvements in the ventilation of telephone booths.

In the telephone booths of the prior art, the need for ventilation has been totally disregarded, and while it was possible to leave the booth door open to permit access of air into the interior, such procedure is undesirable because it defeats the primary purposes of the booth, which are to give privacy to the user, preventing intrusion of extraneous sound which might distract the attention of the user, and prevent him from hearing or understanding the telephone conversation, and preventing outsiders from hearing the conversation of the booth user.

The booths have generally been made as nearly soundproof as possible, and they were therefore constructed without ventilation openings, so that the air soon became polluted by the exhalations of the user, so that it was extremely undesirable, unhealthful and uncomfortable to remain in one of the prior booths for any considerable length of time, with the door closed.

The prior booths have been particularly uncomfortable during hot weather when the heat and lack of ventilation combined to make the use of one of the unventilated prior booths a most uncomfortable procedure.

It will thus be observed that in the past, the requirements of soundproofing and privacy have been incompatible with the provision of ventilation, resulting in the total lack of the latter, which is a necessity from the points of view of health, comfort and efficiency. The lack of ventilation has been an important factor affecting the amount of use of the telephones and booths, since the discomfort of telephoning in one of the prior booths, particularly during hot weather, was sufficient to deter many people from using the booth.

Since the booths are generally subject to periodic use and ventilation is most needed when the booth is actually in use with the door closed, the provision of positive mechanical ventilation during use is preferable, but the use of ordinary mechanical devices is subject to the disadvantages of noise of operation of the motor and of the fan, which becomes an important factor when enclosed in a relatively small cabinet where it is necessary to listen closely to understand the spoken word, particularly in long distance telephoning.

The cabinet walls may also act as a sound box for the sounds of the motor and fan, and the ordinary motor hum or vibrations due to loose bearings or end play becomes magnified to a rumble if the motor has a direct metallic connection to the wooden cabinet.

It is very important, therefore, that the ventilation system be practically noiseless, so that it will not detract from the advantages of quiet and privacy of an ordinary booth, and that the change of air may be accomplished without transmitting sound through the walls of the booth. The ventilation should also be accomplished efficiently without creating a draft on the user, and automatically without the necessity of attention on the part of the user, or others.

All of these problems and difficulties have been solved by the completion of adequately ventilated booths embodying the features described herein, and the improved booths have already demonstrated the many advantages which are the result of the improved structure and arrangement of the elements of the invention.

One of the objects of the invention is the provision of an improved method or system for ventilation of telephone booths, or the like;

Another object is the provision of an improved telephone booth in which positive ventilation is effected noiselessly, without draft or discomfort and without attention on the part of the user.

Another object is the provision of an automatically ventilated telephone booth.

Another object is the provision of an improved motor mounting for ventilation systems such as telephone booths, by means of which motor vibration and most of the incident noise of the motor are eliminated, and practically none of the sounds of the motor or fan are transmitted to the walls of the booth;

Another object is the provision of an improved fan and ventilation apparatus, which are practically silent in operation so as to be adaptable for use in ventilating a telephone booth during the use of the telephone.

Another object of the invention is to provide a telephone booth having positive ventilating means controlled by the opening and closing of the door so that when the booth is occupied, positive ventilation is effected.

Another object of the invention is to provide a telephone booth with an electric fan and an electric light controlled by a switch which is closed when the door is closed.

Another object of the invention is to provide mechanical means for removing polluted air from telephone booths, and means to prevent escape and entry of sound through the air outlet.

Another object of the invention is to provide a telephone booth in which a lamp is adapted to

illuminate the interior of the booth and also a window or transparent panel in the front thereof.

Another object of the invention is to provide an improved telephone booth in which the exhausting fan is obscured from view from both the inside and outside.

Another object of the invention is to provide an improved motor mounting comprising a sheet of sponge rubber which constitutes a partition through which the air is exhausted and also prevents communication of noise or vibration of the motor to the body of the booth.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the drawings, of which there are five sheets;

Fig. 1 is a front and side view in perspective of a telephone booth embodying the invention;

Fig. 2 is a fragmentary, vertical, sectional detail of the upper part of the booth on a larger scale, taken on the plane of the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2, of a modification;

Fig. 4 is another similar view of another modification;

Fig. 5 is a bottom plan view of one form of the ventilation apertures in the ceiling about the lighting fixture;

Fig. 6 is a fragmentary, sectional view taken on the plane of the line 6—6 of Fig. 2, showing the operative mechanical connection between the door and control switch;

Fig. 7 is a horizontal view of one corner of the booth in partial section;

Fig. 8 is a sectional view through the control switch, taken on the plane of the line 8—8 of Fig. 7;

Fig. 9 is a wiring diagram;

Fig. 10 is a detailed sectional view of the motor mounting;

Fig. 11 is an elevation of the switch, various positions of the actuating arm being indicated in dotted lines.

Fig. 12 is a plan view of a further embodiment of the invention, the top cover being partly broken away to show the interior mechanism;

Fig. 13 is a sectional view taken on the line 13—13 of Fig. 12;

Fig. 14 is an elevational view of the motor mounting as viewed on line 14—14 of Fig. 12; and

Fig. 15 is a fragmentary sectional view taken on the line 15—15 of Fig. 14.

Referring to the drawings, the telephone booth is designated generally by the numeral 10. The booth comprises side walls 11 and 12, a rear wall 13, door frame 14, door 15, floor 16, and upper ceiling 17, and an inner ceiling 18 in spaced relation thereto to provide a chamber 19 in the upper part of the booth.

The door frame 14, door 15, and the operating mechanism for the door 15, and the structure of the booth generally, are preferably of the type disclosed in my prior Patent No. 1,770,612, granted July 15, 1930, and consequently need not be described in detail.

Referring to Figs. 1 and 3, it will be observed that the door 15 includes a pair of door leaves 20 and 21, the latter of which is mounted upon the door frame 14 by a plurality of hinges 22, the uppermost of which is shown in Fig. 5. The door leaves 20 and 21 are preferably united by a hinge 23 which extends for the full length of their abutting edges, which are preferably of the non-pinching construction shown in the patent above refered to.

The hinges 22 are preferably constructed so that the leaves 20 and 21 may be folded into a position, inside the booth, flush with the vertical member of the door frame 14 on which the leaf 21 is mounted. The leaf 20 is preferably provided at its upper end with a slider 24*a* for slidably engaging in a guide 24 to assist in the folding of the leaves. The movable flange of the uppermost hinge 22 has secured thereto a vertical rod 25 which, in the modification shown in Fig. 2, extends upwardly through suitable openings in the ceiling 18 and other transverse panels or members, hereinafter described, within the chamber 19. At its uppermost end, which is adjacent the ceiling 17, the rod 25 is bent to provide a horizontal portion 26, the function of which will be hereinafter described. The leaf 20 is provided internally with the usual handle, as described in my prior patent, whereby the leaves may be folded into open position.

When the door leaf 21 is moved to open position, the horizontal portion 26 of the rod 25 which extends into the chamber 19, describes an arc and is adapted to engage and actuate the switch arm 47 of the control switch 33.

In the more simple embodiments of the invention, the horizontal portion 26 of the rod may engage the switch arm directly, but the horizontal portion 26 is preferably provided with a non-metallic or fiber strip 58 adapted to engage the switch arm 47, and the fiber strip 58 is preferably mounted on the arm 26 by a plurality of screw bolts 58*a* passing through the arm 26 and threaded into the fiber 58. A resilient and yieldable rubber cushion may be interposed between the fiber block 58 and the horizontal portion 26 of the rod, and also between the screws 58*a* and the arm 26, so as to eliminate shock and noise in the operation of the switch 33.

The booth is preferably provided with the auxiliary chamber 19 above the ceiling 18 and the front of the booth above the door 15 preferably comprises a panel 27 which forms the front closure for the chamber 19. The panel 27 is provided with a ventilation opening 28, preferably circular in shape, in which are located the blades 29 of an electric fan 30, which is adapted to effect the evacuation of air from the booth efficiently and noiselessly while the booth is in use.

Many different types of electric fans might be used for this purpose, provided the fan and motor are practically noiseless or sufficiently noiseless so that they do not interfere with the use of the telephone. The ordinary vibration of the motor and whir of the fan become important factors where silence is imperative, and experiments with a great number of different kinds of motors and fans indicate that most of the noise of the fan may be eliminated by stream-lining the outer peripheral edges of the fan blades. The fan is also preferably provided with a multiplicity of blades equally spaced about its periphery so as to impel the largest possible volume of air with a minimum amount of noise, but any convenient type of motor may be employed.

The motor 30 is preferably provided with a supporting frame 31 comprising a plurality of radially and forwardly extending resilient arms 31*a* which may be secured to the motor casing by the same bolts 31*b* which secure the parts of the casing together. The ventilation opening 28 is pref-

erably lined with an annular metal member having a substantially cylindrical flange 70 and an outwardly extending annular flange 71 which is secured to the motor supporting frame 31 by wood screws 72.

The wood screws 72 pass through apertures in the arms 31*a* and in the annular flange 71, and preferably have their heads insulated from both of these metal members by interposing metal and rubber washers 73, 74 between the head and the metallic members 31, 70. The annular member 70 is also preferably insulated from the panel 27 by interposing a resilient and yieldable rubber gasket 75 between the annular flange 71 and the wood of panel 27, and the rubber gasket 75 preferably extends into the ventilation aperture 28 between the cylindrical flange 70 and the edge of aperture 28.

In some embodiments of the invention, where simplicity and economy of manufacture are more important, some of these details of sound insulation between the motor and wood of the cabinet may be omitted, but resilient and yieldable rubber is preferably interposed between the metallic parts of the motor and the wood of the cabinet, so as to provide a resiliently yieldable mounting for the motor to eliminate the vibration of the motor and the noise incident thereto, and also to prevent the transmission from the motor to the wood of the cabinet, of any sound from the motor.

Where there is a direct mechanical connection from the motor to the wood of the cabinet, the relatively rigid mounting of the motor accentuates the vibration of the motor and the noise incident thereto, and the walls of the cabinet seem to act as a sound box magnifying the noise of the motor and fan into larger proportions.

It will thus be observed that the present resilient mounting for the motor not only improves the operation of the motor, but prevents the transmission and magnification of motor noise.

The switch 33 is preferably supported on the upper side of the ceiling 18 or the lowermost of the sound baffles where they are employed, and the switch 33 is located so that its switch arm 47 may be engaged by the horizontal portion 26 of the actuating rod 25. Since it is also desirable that the booth be lighted during the use of the telephone, the switch 33 may also control the supply of current to the light 34 which is carried by the connection box 35 mounted on the upper side of ceiling 18.

In the embodiment of Fig. 2, the ventilation openings in the ceiling are provided in the lighting fixture and the connection box 35 is centrally located with respect to an opening 36, the underside of which is covered by a metal light fixture plate 37. The plate 37 is provided with a central opening which is normally closed by a globe supporting plate 39 which is hinged to the plate 37 and provided with an opening for a globe 40 which surrounds the lamp 34.

The outer area of the plate 37 is provided with a plurality of slots 38 serving as ventilation openings in the ceiling 18 and providing communication between the chamber 19 and the interior of the booth 10.

The current supply connections preferably include a standard wall connection box 76 which contains a female connector adapted to cocperate with the usual wall connector plug 77.

Referring to the wiring diagram, Fig. 9, it will be observed that the lead 78 from the wall socket extends to the switch 33, and auxiliary leads 80 and 81 extend from the switch 33 to the light 34 and motor 30. Return leads 79 and 82 extend from the wall socket 76 to the light 34, and motor 30, and the motor and light are thus connected in parallel to be controlled by the single switch 33.

In some embodiments of the invention the light may be omitted. The leads 78 and 79 are preferably enclosed in standard metallic conduit sections 41, 42 and 43, extending from the connection boxes 76 and 35 to the motor 30 and switch 33, thereby enabling the assembly of the electrical devices as a unit and their installation into the telephone booth in a most economical manner.

The switch 33 is preferably adapted to be actuated only after the door has been moved to a predetermined closed or substantially closed, position, and the switch is also preferably adapted to open as soon as the door has been opened to a predetermined point. For this purpose, I prefer to employ a snap switch of the type which is adapted to be held in closed position, but which returns to open position as soon as pressure is removed from the switch actuating arm 47.

The switch 33 comprises a box 44 in which is mounted a support member 45 comprising spaced vertical webs which form a bearing for the horizontal portion 46 of the exterior switch actuating arm 47. A coil spring 48, having abutments on the horizontal bar 46 and on one of the webs of the support 45 resiliently holds the arm 47 against an abutment 49 provided by the cover of the box. Between the vertical webs of the support 45, a lever 50 is rigidly mounted upon the horizontal bar 46. This lever provides an eye 51 for the engagement of a spring 52, and the finger 53 which is adapted to engage the spring 52 and cause it to snap into the "off" position at a definite position of the arm 47, which position is indicated in dotted lines at *c* in Fig. 11. The outer end of the spring 52 is connected to the outer end of a pivoted lever 54 which is of U-shape, the inner ends being slotted so as to engage with pins 55 carried by the vertical webs of the support 45. The lever 54 carries an insulated contact 56 which is adapted to bridge between the flexible contacts 57 in the "on" position of the switch, which is shown in Figs. 7 and 8.

When the door is closed, the arm 47 occupies the position "*a*" in Fig. 11, the horizontal length 26 of the rod 25 being out of contact with the arm 47. When the door is opened, the rod 25 is rotated about the axis of the hinge 22, and the horizontal length 26 is moved towards the position shown in dotted lines in Fig. 7. The horizontal portion 26 carries a contact piece 58 which engages the arm 47 and moves it into the position "*c*" in Fig. 11.

As described above, at this point the finger 53 contacts with the spring 52, which has attained a position beneath the line connecting its upper end with the axis of the horizontal bar 46, and the circuits of the fan and lamp are broken with a snap action. The position "*d*" corresponds to the fully open position of the door.

When the door is opened, the horizontal actuating member 26 moves back toward the closed position of Fig. 7 and the switch arm 47 follows the actuating member 26 on account of the tension of the coil spring 48. The contacts are not opened, however, until the inner end of the spring 52 passes the dead center between the shaft 46 and the outer end of spring 52 when the switch actuating arm 47 has reached a position approximating that shown in the dotted lines

"c" of Fig. 11. The switch is then opened with a snap action and the light and fan cut out of circuit.

It will thus be observed that if desired, the door may be slightly opened to increase the ventilation. The door may be opened slightly also for the purpose of conferring with a person outside the door, without stopping the fan or turning off the light, and a positive actuation of the switch contacts is also assured, which will prevent burning of the contacts and maintain them in good condition for a long period of time.

The outer end of the ventilation opening 28 is preferably covered with a screen 83 of slightly larger size than the opening 28 which is secured in place by a circular molding 84. The screen prevents interference with the action of the fan and conceals the unsightly mechanical details from view at the front of the telephone booth.

Referring to Fig. 3, this is one of the preferred embodiments of the invention in which the ventilating opening in the ceiling is located differently from that of Fig. 2. In the device of Fig. 3, any kind of convenient lamp fixture may be employed and the ventilating opening is preferably located at the rear side of the booth in the ceiling. This opening 83 may consist of a slot extending from one side to the other of the booth in the ceiling 18, substantially as illustrated in my prior application, Serial No. 481,859, for Telephone booths, filed September 15, 1930.

It is found that with the arrangement described, sounds which might otherwise pass through the ventilating opening 28 in the front of the booth, are substantially absorbed in the chamber 19, and the ventilated booth is substantially soundproof. If desired, however, a number of different baffles may be provided in the chamber 19 as illustrated in Fig. 4, and these baffles are preferably provided with slots 83 located at opposite sides of the booth, so that the sound passing through the chamber 19 is forced to take a circuitous path, which absorbs and dissipates the sound and prevents its transmission into or out of the booth through the chamber 19. The baffles 59 may be made of any sound absorbing material, such as the well known types of fibrous wallboard, which are manufactured of the bagasse of sugar cane.

In the modification of the invention illustrated in Figs. 12 to 15 inclusive, the front panel 27 is provided with an opening 85 which is occupied by a pane of glass 86 or other transparent or translucent material, which may suitably support a legend or other sign which is adapted to be illuminated by the lamp 34. In this modification the box 35 and lamp 34 are elevated so that the light shines directly upon the pane 86 as well as the globe 40 through which the interior of the booth is illuminated. On the rearward side of the lamp a reflector 87, preferably of arcuate form, is mounted, so as to project light forwardly from the lamp 34 to illuminate the window 86.

The air is exhausted from the booth through the slot 83 which may be located adjacent the rear wall 13 of the booth, which position renders it less conspicuous. The fan 30 is mounted in a web of sponge rubber 88 which extends across one corner of the chamber 19, its vertical edges being secured to the vertical walls of the chamber by means of screws. This web of sponge rubber constitutes a triangular chamber 89 which is open in the upper direction, the cover 17 being cut away as shown at 90. In order to provide transverse support for the web 88, I provide the cover 17 and ceiling 18 with grooves 91 and 92 respectively, into which the upper and lower edges of the web 88 extend. The web 88 is provided with a central opening 93 which receives a collar 94 which is integral with a flange 95 which engages the outer face of the web 88. The flange 95 comprises integral lateral extensions 96 which support outwardly directed arms 97, the ends of which are curved to provide straps 98 which extend around the motor 30. The straps 98 are secured together by bolts so as to hold the motor rigidly in position. The mounting of the motor 30 is such that its vanes 29 are located within the collar 94. It will be noted that the motor 30 is mounted exclusively on the web of sponge rubber 88 and moreover is located outside the chamber 19 so that motor noises are less apt to be carried into the interior of the booth.

The present method or system of ventilation and the operation of the apparatus described herein is outlined briefly as follows.

When the booth is not in use, the door is open and the switch 33 is held in open position by the engagement of the actuating rod 26 with switch arm 47 and the friction and inertia of the door leaves is sufficient to hold the switch in open position under these conditions. No ventilation or light is necessary when the booth is not in use, and the door is open, and consequently the motor and light are preferably disconnected at that time.

When a user enters the booth and closes the door by means of the usual handle, the switch 33 is permitted to close under the action of its coil spring 48 and the fan and light are connected in circuit and operate as soon as the door has reached a predetermined position. The light is preferably present for the purpose of permitting the reading of the telephone book or jotting down memoranda, and to indicate to persons outside the booth that the booth is in use, since the user can be seen more conveniently. The fan is then operated at a predetermined moderate speed, with a minimum amount of noise, on account of the resilient motor mounting, and the slight amount of noise which is present in the fan is muffled and absorbed by the resilient rubber mounting for the motor, which prevents the transmission of sound to the walls of the cabinet, which would otherwise act as a sound box in magnifying the motor noise.

The operation of the fan at a moderate speed with blades of streamline shape at the peripheral edge, eliminates also the whir or hum which is usually due to the fan blades and the fan operates to drive air out of the front of the booth and evacuate the polluted air from the interior of the booth. The fan is preferably located in the upper part of the booth so that the heated and polluted air will be removed from that part of the booth and evacuation of air from the upper part of the booth draws in fresh air from all of the crevices about the door leaves, and particularly at the bottom of the booth below the door leaves. The booth may be provided with auxiliary air inlets, if desired, but I prefer to rely upon the natural ventilation which is induced by the reduced pressure on the interior of the booth when the polluted air is evacuated by means of the fan.

The present booth is capable of maintaining an effective ventilation without a draft on the user, and substantially without noise so that the telephone booth is made a comfortable and more

healthful apparatus, and the many disadvantages which have been caused by the lack of ventilation are entirely eliminated.

While I have illustrated preferred embodiments of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim is new and desire to secure by Letters Patent of the United States, is:

1. In a telephone booth the combination of a booth with an electric fan, a resilient sound insulating rubber cushion interposed between said fan and said booth to prevent transmission of the sound of said fan, said fan being adapted to effect forced ventilation of said booth and said booth having a door, an electric switch adapted to control said electric fan, and operative mechanical connections between said switch and said door whereby said door is adapted to actuate said switch, said mechanical connections including means for permitting lost motion between said door and switch whereby said switch is not actuated until said door reaches a predetermined position.

2. In a telephone booth, the combination of a ventilating device with an electric motor for driving said ventilating device, said telephone booth having a door, an electric switch for controlling the circuit of said electric motor, said switch being of the snap type having an actuating arm adapted to be moved through a predetermined range and to operate said switch at a critical point, and operative mechanical connections between said door and said switch whereby said switch is actuated only when said door is moved into substantially closed or substantially open position.

3. In a telephone booth, the combination of a booth with a body of soft resilient rubber forming a part of a wall of said booth, said rubber body being formed with a ventilating opening, an electric motor driven fan carried by said soft rubber body and having its fan disposed in alignment with said ventilating opening to effect forced ventilation of said booth through said opening in said rubber body.

OLE GULLICKSEN.