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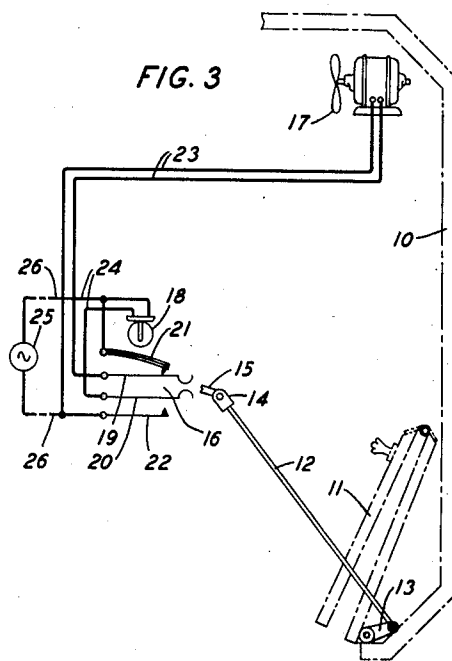
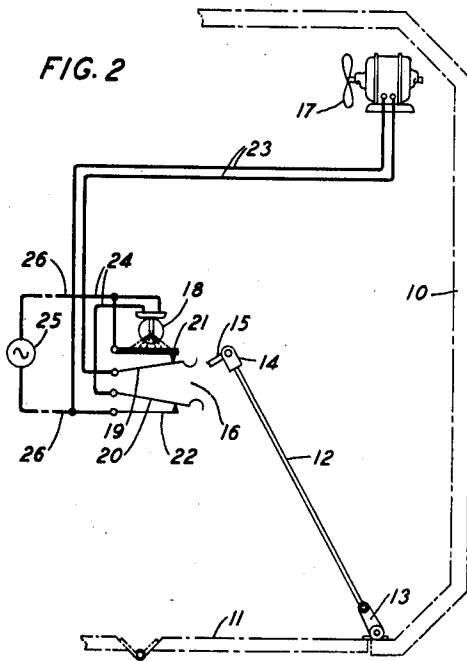
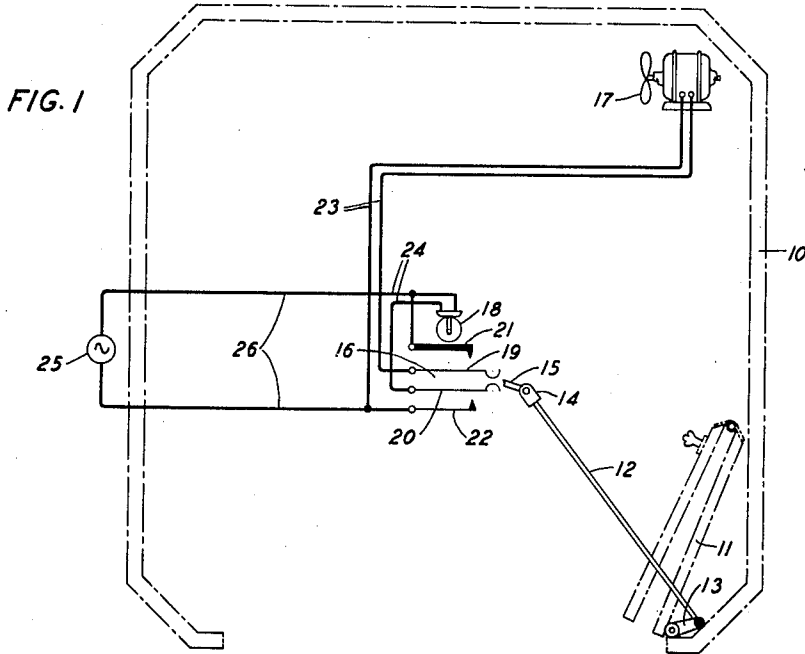
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2,332,091

VENTILATING SYSTEM FOR TELEPHONE BOOTHS

Filed May 3, 1941

2 Sheets-Sheet 1



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FIG. 4

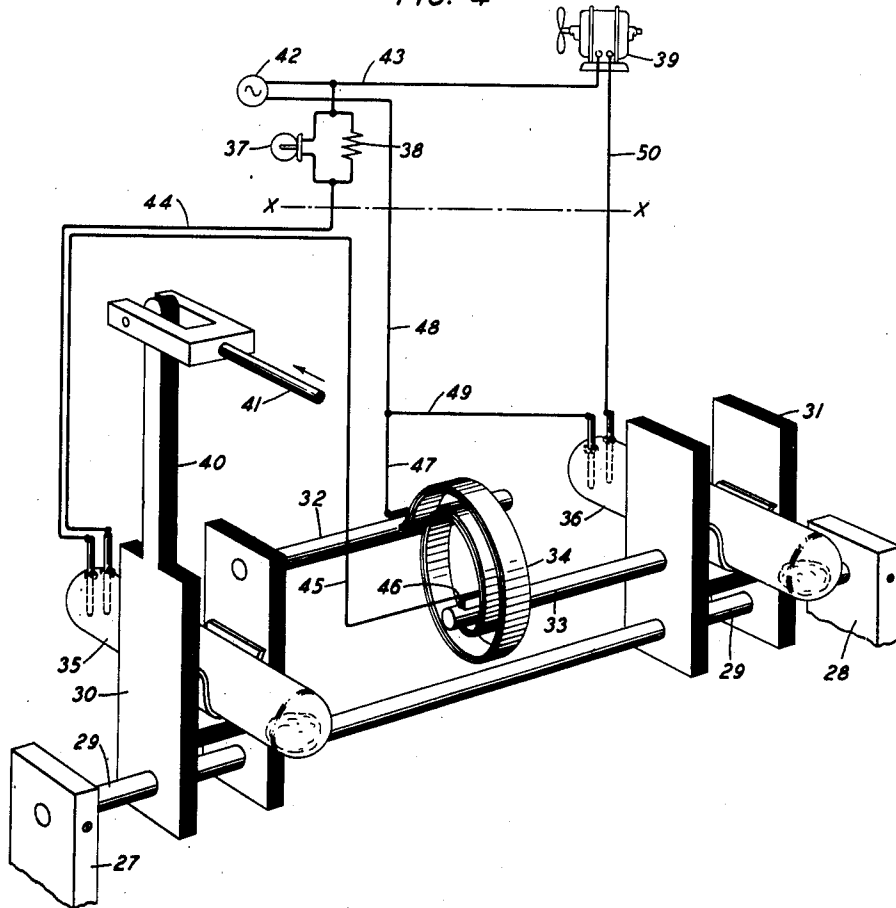
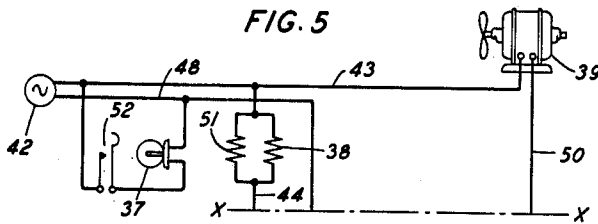


FIG. 5



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# UNITED STATES PATENT OFFICE

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## VENTILATING SYSTEM FOR TELEPHONE BOOTHS

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7 Claims. (Cl 98—29)

This invention relates to telephone booths and more particularly to the type of booth which is ventilated by a motor-driven fan controlled by the operation of the booth door.

In telephone booths now in use the fan which is installed therein for the purpose of ventilating the booth is automatically turned on when the booth door is closed and automatically turned off when the booth door is opened.

The object of the present invention is the provision of a telephone booth in which the vitiated air in the booth is expelled after the occupant leaves the booth and the door is opened, so that fresh air is provided for the next patron.

In accordance with this invention the fan is maintained in operation after the booth door is opened for a predetermined interval of time instead of being shut off by the opening of the door as in booths now in use.

In the preferred form of my invention, I locate adjacent the lamp in the booth, which is automatically lighted when the booth door is closed and extinguished when the door is opened, a thermostatically controlled switch which due to the heat absorbed from the lamp when it is lighted, maintains the fan in operation after it is extinguished and the door is opened. The length of time that the fan will remain in operation is directly proportional to the length of time that the booth is in use, i. e., the longer the lamp burns, the longer the fan will operate after the door is opened. The length of time that the fan will run after the booth is vacated can be readily controlled within certain limits by the adjustment of the thermostatic switch.

In a modified form of my invention I have provided a pair of mercury switches, one for controlling the turning on and off of the lamp and the other for controlling the operation of the fan. I have connected in parallel with the lamp a resistance element which increases the current flow through the bimetallic element. This bimetallic element links the switches together so that they operate as a unit when the door is closed, but not when it is opened. Due to the current passing through the bimetallic element, heat is generated therein which causes it to expand, thereby maintaining the fan switch closed and the fan in operation after the lamp has been extinguished and the door opened. As the heat is dissipated from the bimetallic element it will return to normal, tilt the mercury switch to the off position and stop the fan.

The features of my invention will be readily apparent from the following detailed descrip-

tion made with reference to the following drawings, of which:

Fig. 1 is a schematic top plan view of a telephone booth with the booth door open and the light switch and fan switch in their normal or open position;

Fig. 2 is a view similar to Fig. 1 except that the booth door has been closed and the light switch and the fan switch have been closed, thus lighting the lamp and putting the fan in operation;

Fig. 3 is a view similar to Fig. 1 except that the fan switch is closed due to the thermostatic element, thereby maintaining the fan in operation with the door open and the light extinguished;

Fig. 4 is a fragmentary perspective view of a modified form of the invention in which a pair of mercury switches are employed to control the operation of the lamp and fan; and

Fig. 5 is a fragmentary view of an alternate circuit arrangement for use when the lamp in the booth is independently controlled.

As shown in Fig. 1, the structure of the telephone booth 10 is indicated by dot and dash lines and is provided at one side with an opening which is adapted to be closed by means of the door 11. Secured to the door 11 and operated thereby is an arm 12, one end of which is pivoted at the door hinge by means of the lever 13 and the other end terminating in a clevis 14 which, in turn is secured to an arm 15 which is secured to the switch operating mechanism (not shown).

The switch 16 for operating the fan 17 and lighting the lamp 19 is schematically shown and comprises, as shown in Fig. 1, a pair of lever arms 19 and 20 which are operated by means of the lever 15. A pair of cooperating contact springs 21 and 22, which when the door 11 is closed, as shown in Fig. 2, closes a circuit to the fan 17 and the lamp 18 over the conductor pairs 23, 24 and 25, the circuit including an alternating current source 25. This causes the lamp 18 to light and the fan 17 to operate.

Due to the fact that the contact spring 21 is constructed from bimetallic material, and located close to the lamp 18, the heat of the lamp will cause it to flex and bear with considerable force against lever arm 19. Thus when the door 11 is opened, as shown in Fig. 3, and for a predetermined interval thereafter the fan contact will still be maintained closed due to the pressure of the contact arm 21 against the lever arm 19, while the circuit to the lamp 18 will be broken by the separation of the contact spring 22 from the lever arm 20. The fan 17 will therefore re-

main in operation until the heat absorbed from the lamp 18 by the contact spring 21 is dissipated, when it returns to normal and opens the circuit, as shown in Fig. 1. Thus, it will be observed that the fan will remain in operation for a certain interval of time to clear the booth of vitiated air after the light 19 is extinguished and the door 11 is opened.

In the modification shown in Fig. 4, a pair of supports 27 and 28, which may be suitably secured thereto a rod 29. Rotatably mounted on the rod 29 are a pair of U-shaped insulating members 30 and 31. These members are spaced apart and are provided on their facing surfaces with extending metallic pins 32 and 33, respectively.

A bimetallic member 34, having a spiral configuration, is positioned between the members 30 and 31 with the inner end of the spiral secured to the pin 33 on the member 31, and its outer end secured to the pin 32 on the member 30. The bimetallic member 34 provides a flexible coupling between the two U-shaped members 30 and 31.

Located in the insulated U-shaped members 30 and 31 are the mercury contact devices 35 and 36, respectively, one of which (35) controls the operation of the lamp and the energization of the resistance 38 and the other (36) controls the operation of the fan 39. When these devices are in their normal positions as shown in Fig. 4 the lamp and fan circuits will be broken due to the fact that these mercury contact devices are slightly out of level thereby maintaining the mercury in the rear of the tubes and away from the contacts in the opposite ends thereof. It is only when these devices are tilted that the mercury will run to the ends of the tubes and closes the circuits to light the lamp 37, energize the resistance 38 and start the fan 39.

Secured to the U-shaped member 30 is an extending arm portion 40 to which is pivotally secured an arm 41 which in turn is operated by the door of the telephone booth (not shown).

As shown in Fig. 4 the contact devices 35 and 36 are in their normal or unoperated position; that is, when the telephone booth door is open. Upon the closing of the door the arm 41 will be actuated thus causing the U-shaped members 30 and 31 and their contact devices 35 and 36 to rotate on the shaft 39. Due to the fact that these members are coupled together by means of the bimetallic member 34, these two mercury switches will tilt in unison thereby closing the circuit to the lamp 37, the resistance 38 and the fan 39.

The circuit for lighting the lamp 37 may be traced from one side of the current source 42 over conductor 43, through the lamp 37, over conductor 44 to one side of the contact device 35, through the mercury in said contact device and the other contact, over the conductor 45 to the terminal 46 on the pin 32, through the pin 32, through the bimetallic strip 34 through the pin 33 to the terminal 47, through the terminal 47, over conductor 48 to the other side of the current source 42, thus completing the circuit to light the lamp 37. The resistance 38 is placed in parallel with the lamp 37 and in series with bimetallic member 34 to permit increased current flow through the bimetallic member.

When the contact device 36 is in its operative or tilted position, as referred to above, the fan circuit is from one side of the current source 42 over conductor 48 through conductor 49 to

one side of the contact device 36, through the mercury in the contact device to the other contact, through said contact over conductor 50 through the fan 39 and back to the current source 42.

While the booth door is closed and current is flowing through the bimetallic strip it will expand or rather partially straighten out due to the fact that the inner element of the strip has a higher coefficient of expansion than the outer element. This straightening out effect continues until the limiting stop for the U-shaped member is reached or in case no stop is used, until the limit of expansion of the bimetallic member 34 is reached.

When the patron opens the door to leave the booth the arm 41 operated by the door rocks the U-shaped member 30 carrying the mercury switch 35 to open the lamp circuit, but the U-shaped member 31, carrying the mercury switch 36, is not rocked back to normal because of the expanded condition of the bimetallic strip 34. It is only when this strip has cooled off and tightened the spiral in which it is formed that the U-shaped member 31 is rocked back to normal to tilt the mercury switch which it carries to open the fan circuit. This interval of time is determined not only by the characteristics of the bimetallic strip, but also within certain limits by the length of time the booth door has been closed.

In some telephone booth installations the lamp, located on the interior of the booth, is under the control of an attendant and is not controlled by the opening and closing of the booth door. For this type of installation a circuit arrangement like that shown in Fig. 5 is employed. As shown in Fig. 5 the lighting of the lamp 37 is controlled by a manually operated switch 49 and an additional resistance 51, having the same value as the resistance 38, is connected in parallel therewith, thereby increasing the current flow through the circuit to heat up the bimetallic element in the same manner as heretofore described with regard to the circuit arrangement shown in Fig. 4.

While there is shown and described herein the preferred embodiment of my invention, it is to be understood that it is not limited or confined to the present details of construction herein described and various modifications may be made therein without departing from the spirit of the invention, and I am only limited by the scope of the appended claims.

What is claimed is:

1. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, an electrically driven fan located in said enclosure to force the ventilation thereof, a lamp for illuminating the interior of said enclosure, circuits for said fan and said lamp, a switch in said circuits having a fan contact spring and a lamp contact spring associated therewith, said fan contact spring controlling the operation of said fan and comprising a strip of bimetallic material, both sets of contact springs adapted to close said fan and lamp circuits to operate said fan and light said lamp by said door when it is closed, said bimetallic contact spring influenced by the heat of said lamp to maintain the fan circuit closed and the fan in operation after the door is opened and the lamp circuit opened.

2. A ventilating system for telephone booths and the like comprising an enclosure, a door for

gaining access to said enclosure an electrically driven fan located in said enclosure to force the ventilation thereof, a lamp in said enclosure for illuminating the interior of said enclosure, circuits for said fan and said lamp, a switch in said circuits actuated by said door as it is closed for putting said fan into operation and lighting said lamp, said switch having a plurality of contact springs thereon, one of said springs located in said fan circuit and constructed of bimetallic material and located adjacent said lamp, said contact spring adapted to be influenced by the heat of said lamp to maintain the fan circuit closed and the fan in operation a predetermined length of time after the door has been opened and the lamp circuit opened.

3. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, a lamp in said enclosure, an electrically driven fan located in said enclosure for circulating the air therein, circuits for said lamp and said fan, a resistance element in said lamp circuit, a pair of switches actuated by said door as it is closed for closing said circuits to put said fan into operation, light said lamp and energize said resistance element, and a bimetallic link in said lamp circuit coupling said switches together for maintaining the fan circuit closed and the fan in operation a predetermined length of time after the door has been opened and the lamp circuit opened by one of said switches, thereby cutting off the current to the resistance element.

4. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, a lamp in said enclosure, an electrically driven fan located in said enclosure, to force the ventilation thereof, circuits for said lamp and said fan, a resistance element in said lamp circuit in parallel with said lamp, a mechanism comprising a pair of switch elements, one in the fan circuit for controlling the operation of the fan and the other in the lamp circuit for controlling said lamp, a bimetallic member coupling said switches together and connected in said lamp circuit, said pair of switches adapted to be operated to close said circuits to energize the resistance element, light said lamp and to start the fan by said door as it is closed, said bimetallic member influenced by the increase of current flowing therethrough, due to the resistance in said lamp circuit, to maintain the fan circuit closed and the fan in operation by keeping the fan switch closed a predetermined length of time after the door has been opened and the lamp switch has been operated to open the lamp circuit.

5. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, an electrically driven fan located in said enclosure to force the

ventilation thereof, a lamp for illuminating the interior of said enclosure, circuits for said fan and said lamp, a resistance element in said lamp circuit in parallel with said lamp, a pair of switches actuated by said door as it is closed for closing said circuits to put said fan into operation, light said lamp and energize said resistance element, and bimetallic means in said lamp circuit coupling said switches together for maintaining the fan circuit closed and the fan in operation a predetermined length of time after the lamp circuit has been opened by the opening of said door, the resistance element deenergized, and the lamp switch restored to normal, by maintaining the fan switch operated and the fan circuit closed.

6. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, an electrically driven fan located in said enclosure to force the ventilation thereof, a lamp for illuminating the interior of said enclosure, circuits for said fan and said lamp, a resistance element in said lamp circuit and in parallel with said lamp, a switch mechanism connected in said circuits having a fan contact element and a lamp contact element associated therewith for controlling the operation of said fan and said lamp, said lamp contact element also controlling the energization of said resistance element in said lamp circuit, said fan contact element and lamp contact element coupled together by a bimetallic member in said lamp circuit, said contact elements adapted to close said circuits to operate said fan, light said lamp and energize said resistance element by said door as it is closed, said bimetallic coupling member influenced by the heat generated therein by the current passing therethrough to maintain the switch in the fan circuit closed and the fan in operation after the door is opened and the circuit to the lamp and resistance element opened.

7. A ventilating system for telephone booths and the like comprising an enclosure, a door for gaining access to said enclosure, an electrically driven fan located in said enclosure to force the ventilation thereof, a lamp for illuminating the interior of said enclosure, circuits for said fan and said lamp, a resistance element in said lamp circuit and in parallel with said lamp, a switch comprising a pair of mercury contact devices connected in said circuit and actuated by said door as it is closed for closing said circuit to put said fan into operation, light said lamp and energize said heating element, and bimetallic means in said lamp circuit coupling said mercury contact devices together and heated by the current passing therethrough for maintaining one of said switches in said circuit closed to maintain the fan in operation a predetermined length of time after the door has been opened, the lamp circuit open and the resistance element deenergized.

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