Feb. 17, 1953 J. H. KING 2,628,550

VENTILATOR FOR TELEPHONE BOOTHS

Filed April 16, 1948 2 SHEETS--SHEET 1

FIG. 1

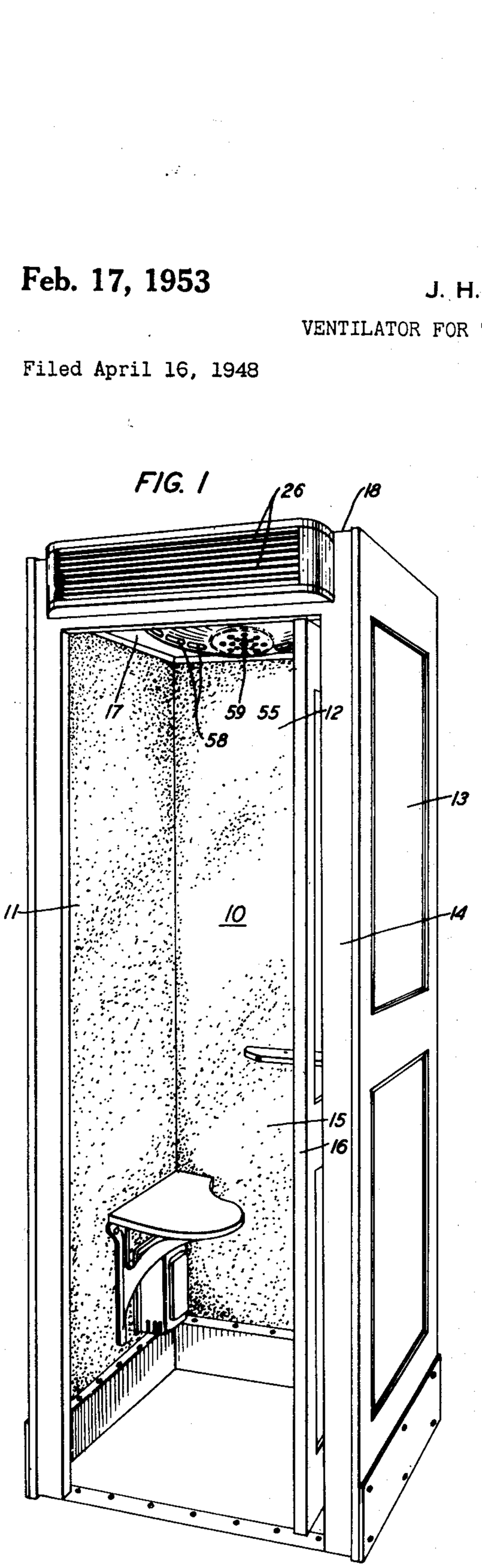
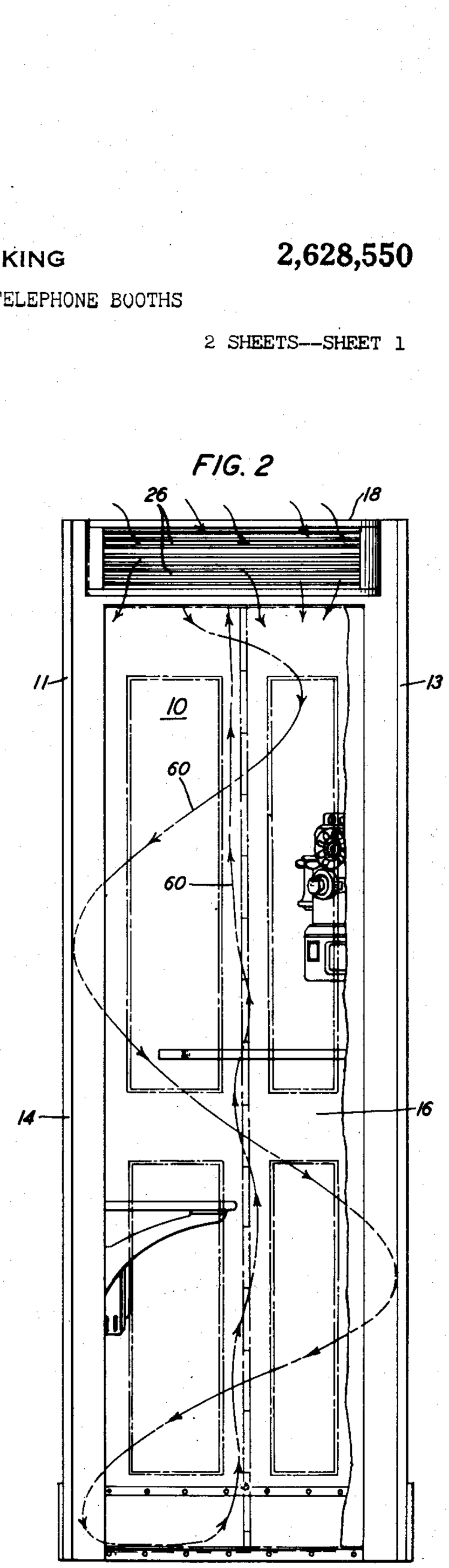


FIG. 2



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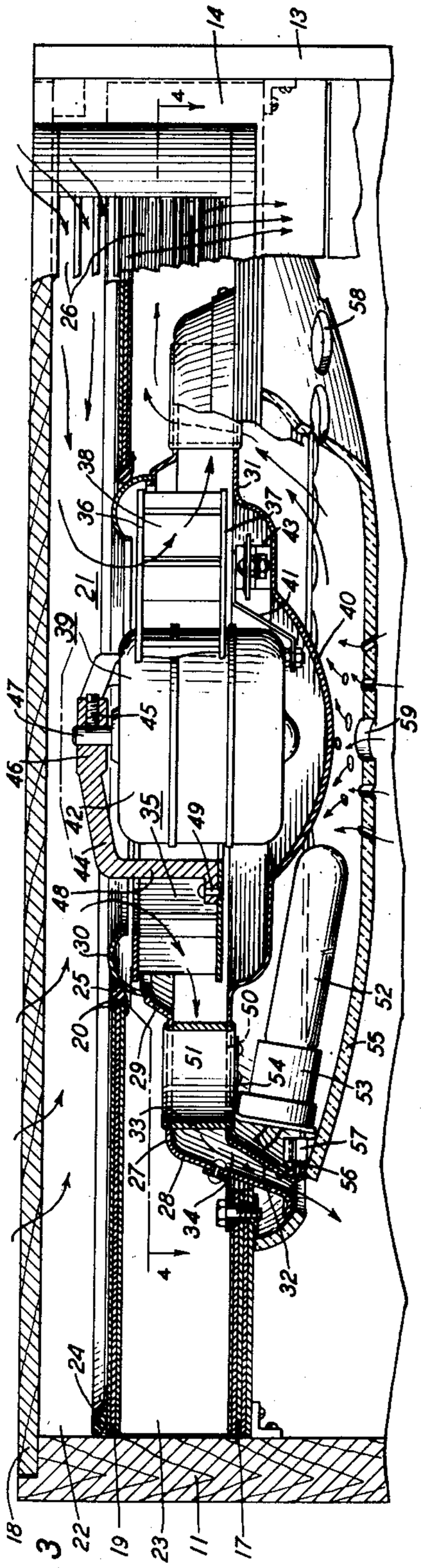

FIG. 3

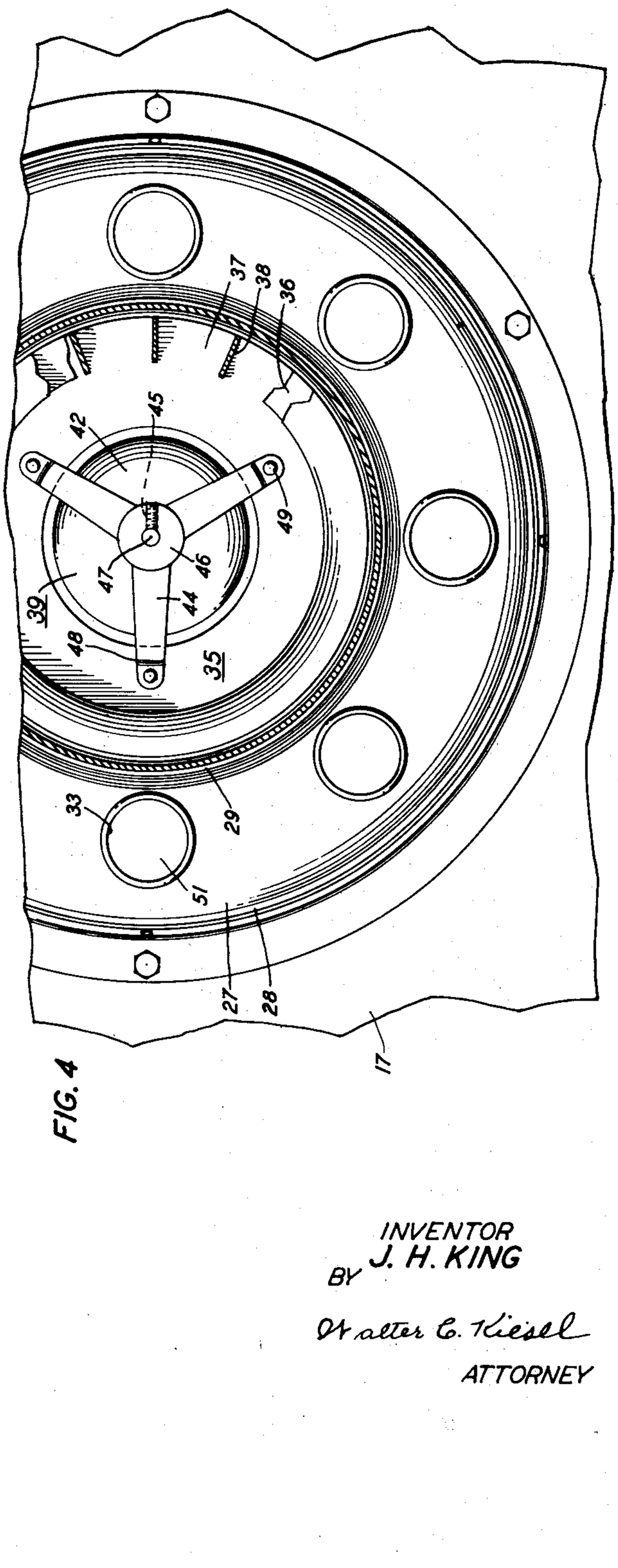

FIG. 4

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VENTILATOR FOR TELEPHONE BOOTHS

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4 Claims. (Cl. 98—33)

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This invention relates to telephone booths and more particularly, to methods of and means for, ventilating such a booth.

Various schemes have heretofore been employed in the forced ventilation of telephone booths wherein a fan and its driving means are situated in the intake or exhaust air path. Some of these systems have included complex ducts extending along the walls, circuitous passages between the double walls of the booths, or the provision of large gaps between the door and the walls or floor. All of those schemes have required a considerable modification of existing booths or the construction of new booths, and, in either case, various undesirable qualities such as complexity of structure, bulkiness, or a noisy interior have resulted.

The primary object of this invention, therefore, is to improve the ventilation of closed telephone booths while rectifying the difficulties set forth above.

Another of the objects of the present invention is to lend compactness to a ventilating system for telephone booths.

Another object is to improve the appearance of the interior of ventilated telephone booths.

According to this invention the ceiling of the booth is provided with a single central opening for mounting a combined ventilator and lighting fixture. This fixture comprises a casing in which is secured a motor arranged to drive an air impeller located in a portion of said fixture comprising an intake air duct. An exhaust air duct is so situated within the casing that the inner port of the inlet duct is circumjacent its inner port, whereby the stream of air supplied to the booth by this ventilator is generated in the form of a rotating hollow frustum of a cone which is projected downward from the ceiling of the booth around the occupant and turned inwardly on itself to return in the form of an inverted vortex to exterior through the exhaust duct.

Another feature is an improved mounting for the air impeller and its driving motor wherein the impeller is carried concentric with the motor thereby reducing the over-all axial length of impeller and motor and the height of the fixture as a whole.

Other features of this invention will appear from the following description and the accompanying drawings in which:

Fig. 1 is a view in perspective of a telephone booth embodying the ventilator of this invention;

Fig. 2 is a front elevation of the booth with its door partially in phantom and closed and showing an air path which is representative of that generated by the ventilator;

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Fig. 3 is an elevation of the upper portion of the booth and the ventilator with part of the front wall of the booth and part of the ventilator broken away showing the elements of this invention and their operative relationship;

Fig. 4 is a fragmentary, sectional view of the ventilator taken along the line 4—4 of Fig. 3.

Referring to the drawings, 10 designates a telephone booth having a plurality of walls 11, 12, 13, and 14, an entrance 15, a door 16 for said entrance, a ceiling 17 and a roof 18. Intermediate the roof and ceiling and parallel thereto is a partition 19, having a central aperture 20 through which projects a portion of a combined ventilator and light fixture 21 which is secured to the ceiling of the booth. The upper and lower compartments 22 and 23 thus formed are sealed from each other by a gasket 24 extending from the upper surface of the partition to the enclosing walls and by another gasket 25 which extends from the edge of the aperture 20 in the partition to the ventilating fixture. Each compartment has at least one opening to the exterior through a wall, the embodiment illustrated having louvered apertures 26 placed one above the other in the front wall 14 above the door.

The outer casing of the unitary ventilator and light 21 of this invention is a ring 27 having an outer downwardly formed frusto-conical flange 28 which is secured to the ceiling 17 and a similarly shaped inner flange 29 extending upwardly so that the ring 27 and its flanges in cooperation with a separate ring 30, suitably secured to the uppermost edge of the inner flange 29, cooperate to form a substantially frusto-conical ring which extends from below the ceiling 17 to above the upper surface of the partition 19. A circular mounting plate 31 having a downwardly formed frusto-conical flange 32 is maintained concentrically within the flange 28 by a plurality of hollow members 33 disposed in a circular configuration around the ring 27 and extending therefrom to the mounting plate. The inner and outer downwardly directed flanges 32 and 28, respectively, are so spaced as to cooperatively form an annular duct 34 therebetween extending into the booth and thereby completing an air path from the exterior through the aperture 26 above the door, the upper compartment 22, the center ring 30, the duct 34 and into the booth.

Situated in the uppermost portion of the duct **34** between the ring **30** and plate **31** is an impeller **35** comprising parallel upper and lower rings **36** and **37** between which are carried a plurality of radially disposed fins **38**. The impeller is rotated by an electric motor **39** maintained in the dished central portion **40** of the mounting plate **31**, this motor being supported therein by a plurality of brackets **41** extending from the motor casing **42** to vibration absorbing mounts **43** secured to said plate.

In order to reduce the over-all height of the fixture **21** the impeller **35** is carried concentrically about the motor **39** by a spider-shaped bracket **44** which is secured by a set screw **45** in its hub **46** to the upward projecting motor shaft **47**. This bracket has a plurality of legs **48** extending from the hub **46** outward and downward around the motor casing **42** to the lower ring **37** of the impeller to which it is secured by some suitable means such as rivets **49**. The inner diameter of the lower ring **37** is such that it provides sufficient clearance from the motor casing **42** to permit its free rotation, however, the upper ring **36** has a substantially greater inside diameter in order that air admitted from the upper compartment **22** through the ring **30** can flow between the motor casing and the inner periphery of the upper impeller ring **36** to the center of the impeller which in turn imparts a rotating radial movement to it through the concentric downwardly turned duct **34** and into the booth.

An exhaust path is provided from the underside of the central portion of the plate **31** through the apertures **50** in which the hollow members **33** are secured, through said members, through apertures **51** in the ring **27** registering with and corresponding to those in the plate, into the lower compartment **23** and to the exterior through the grills of the opening **26**. A light **52** or a plurality of lights are maintained in the path of the exhaust air under the central portion of the mounting plate **31** whereby the heat produced by them is carried to the exterior of the booth. In the particular embodiment illustrated the light socket **53** is secured by a bracket **54** to the underside of plate **31**. However, it is to be understood that the lights can be mounted in any convenient manner within the circumference of the flange **32**.

A translucent dome **55** preferably of some plastic such as Plexiglas is secured against the lower lips of the flanges **28** and **32**, thus covering the portion of the ventilator and light which would otherwise be exposed to the interior of the booth. This dome is maintained in position by a plurality of brackets **56** fastened to and extending from the underside of the flange **32**, the attachment of the dome being accomplished by screws which extend through suitable holes in the brackets **56** and into tapped holes in the integral blocks **57** of the dome.

The dome is provided with two groups of openings **58** and **59**, one of the groups **58** being peripherally disposed on the dome **55** and registering with the opening between lowermost lips of the flanges **28** and **32** constituting the inner port of the duct **34**, and the other group **59** being centrally located on the dome and thus concentric with said first-mentioned group. It is to be noted that the outer ring of openings of the central group **59** are cut at such an angle that the occupant of the booth cannot tamper with the illuminating means by inserting objects through said holes and into the compartment formed between the mounting plate **31** and the dome **55**.

In operation, this device is actuated by the occupant when he closes the booth door **16**, this in turn closing the electrical contacts of a switch (not shown) of the type generally used to close the electric circuits to the auxiliary equipment associated with telephone booths. The booth is thus illuminated and the motor energized thereby imparting a rotation to the impeller which draws the air into the upper compartment and forces it with a rotating motion through the intake duct **34** and into the booth. This fresh air circulates within the booth in a downwardly directed rotating hollow frustum of a cone which turns in upon itself in the lower portions of the booth and flows therefrom in the form of an inverted vortex as represented by the dot-dash line **60** in Fig. 2 through the exhaust path set forth previously. Thus the flow of air thoroughly scavenges the interior of the booth removing the vitiated air and constantly supplying the occupant with fresh air.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. The combination of a booth and a ventilator therefor comprising a plurality of walls, a ceiling and a roof affixed to said walls, a partition disposed intermediate said roof and said ceiling and extending to said walls thereby forming an upper and lower compartment, one of said walls having an aperture intermediate said roof and said partition, one of said walls having a second aperture intermediate said partition and said ceiling, said partition and said ceiling each having an aperture, a ventilator casing extending from the aperture in said ceiling through the aperture in said partition, a mounting plate supported from said casing with its periphery and major surfaces in spaced relationship to said casing and in a plane parallel to said ceiling, said casing and said plate defining a first air duct extending from the partition aperture through the ceiling aperture, said casing and said plate each having a plurality of apertures, a plurality of hollow members secured to said casing and plate and each registering with one of each of said casing and plate apertures to define a duct from the under surface of said plate through said casing to said lower compartment, an impeller situated in said first duct and arranged to force air into said booth, a motor for said impeller mounted on the upper surface of said mounting plate and having its armature shaft perpendicular to said plate, and means carried by said shaft to rotatably support said impeller concentric with said motor and in a plane parallel to said mounting plate.

2. A ventilator adapted to be placed in a panel aperture, comprising an outer casing having an inlet port behind said panel, said casing comprising a flat annular portion parallel to said panel and having a flange on its outer periphery, a mounting plate supported in said casing with its periphery and major surfaces in spaced relationship to said casing and its major surface parallel to said annular portion, said casing and said plate each having a plurality of apertures, a plurality of hollow members secured to said casing and said plate, said hollow members having open ends registering with the apertures in

said casing and said plate to form an air path from the external surface of said plate to the exterior of said casing, said hollow members supporting said plate from said outer casing, an impeller having an open center portion and arranged to force air between said casing and said plate, a motor mounted on said plate and within the open center portion of said impeller and having its armature shaft perpendicular to said plate, and means carried by said shaft to rotatably support said impeller in a plane parallel to said mounting plate and between said flat annular portion and said mounting plate.

3. A ventilator device adapted to be mounted in a single aperture in a telephone booth ceiling, said device comprising a circular mounting plate having a frusto-conical rim portion, a flat annulus above and parallel to said plate, a frusto-conical shaped flange depending from the outer periphery of said annulus and coaxially surrounding said plate, said mounting plate cooperating with said annulus and said flange to define a first air duct directed inward of the booth, a motor disposed in the opening of said annulus at the center thereof, a plurality of means carried by said mounting plate for supporting said motor, an impeller situated between said annulus and said plate within said first duct and adapted to be driven by said motor, said plate and said annulus each having a plurality of apertures, and a plurality of hollow members each having open ends registering with a respective aperture of said annulus and a respective aperture of said plate, said hollow members being secured to said plate and said annulus to support said plate from said annulus in spaced relationship to said annulus and serving as air ducts from the underside of said mounting plate across said first duct.

4. A ventilator device adapted to be mounted in a single aperture in a telephone booth ceiling, said device comprising a circular mounting plate having a frusto-conical rim portion, a flat annulus above and parallel to said plate, a frusto-conical flange depending from the outer periphery of said annulus and coaxially surrounding said plate, said plate and said annulus each having a plurality of apertures, a plurality of hollow members secured to said annulus and said plate,

each of said members having open ends registering with one of said plate apertures and one of said annulus apertures to define a duct from the under surface of said plate through said annulus, said hollow members supporting said plate from said annulus in spaced relationship to said annulus, a motor disposed in the opening of said annulus at the center thereof, a plurality of means carried by said mounting plate for supporting said motor, a spider-shaped bracket secured to the armature shaft of said motor, a centrifugal impeller secured to said bracket for rotation between said plate and said annulus upon the operation of said motor, said mounting plate cooperating with said annulus and said flange to form a duct having an annular cross section in planes parallel to said plate directed inwardly of the booth, and a dome-shaped member secured to said mounting plate having a plurality of peripherally disposed openings serving as air inlets contiguous to said duct of annular cross section and a plurality of centrally disposed openings serving as air outlets from the interior of the booth to the under surface of said plate.

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