April 10, 1951 L. J. JENN 2,548,607

VENTILATOR

Filed July 2, 1945 2 Sheets-Sheet 1

Fig.-1

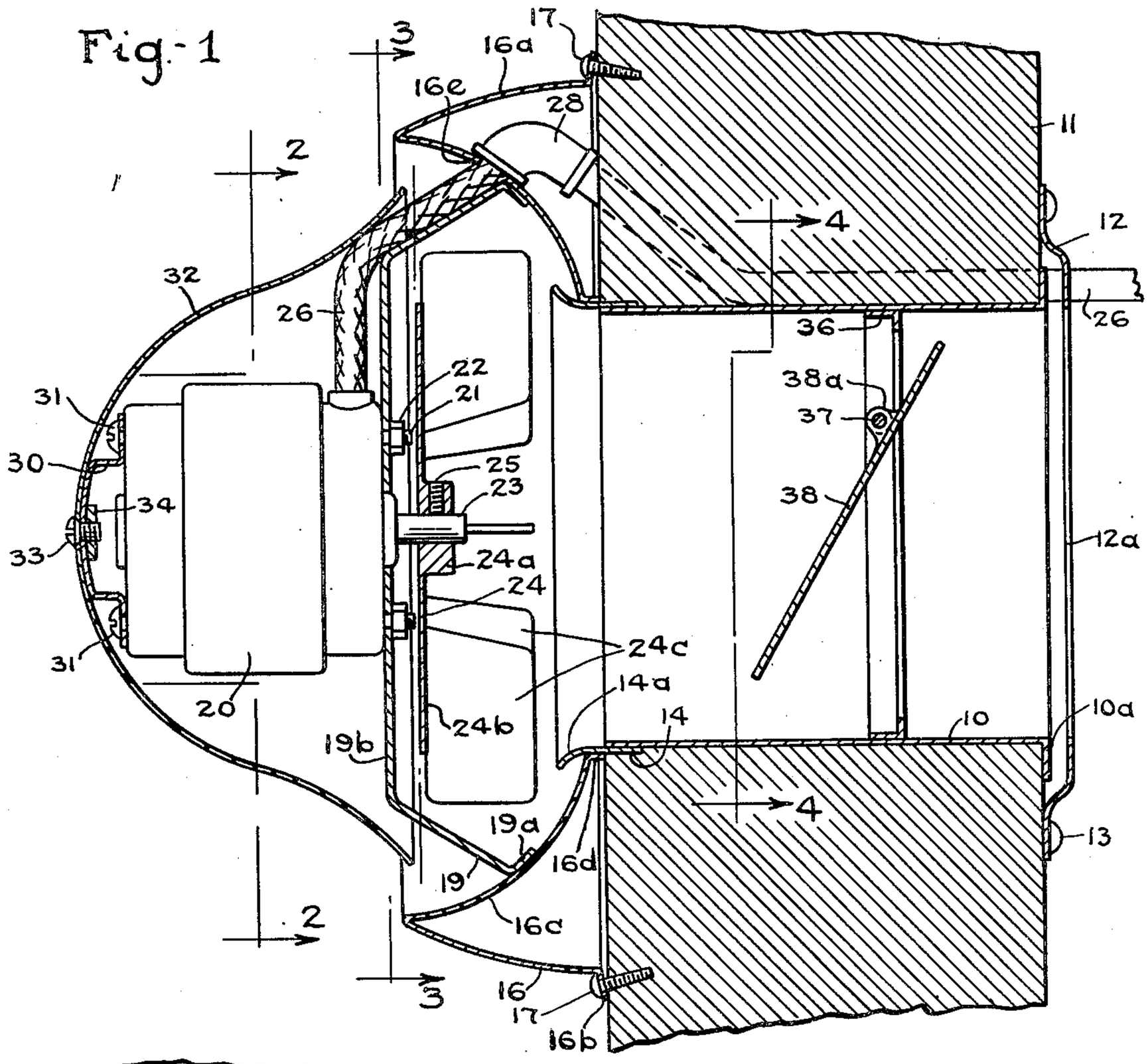

Fig.-2

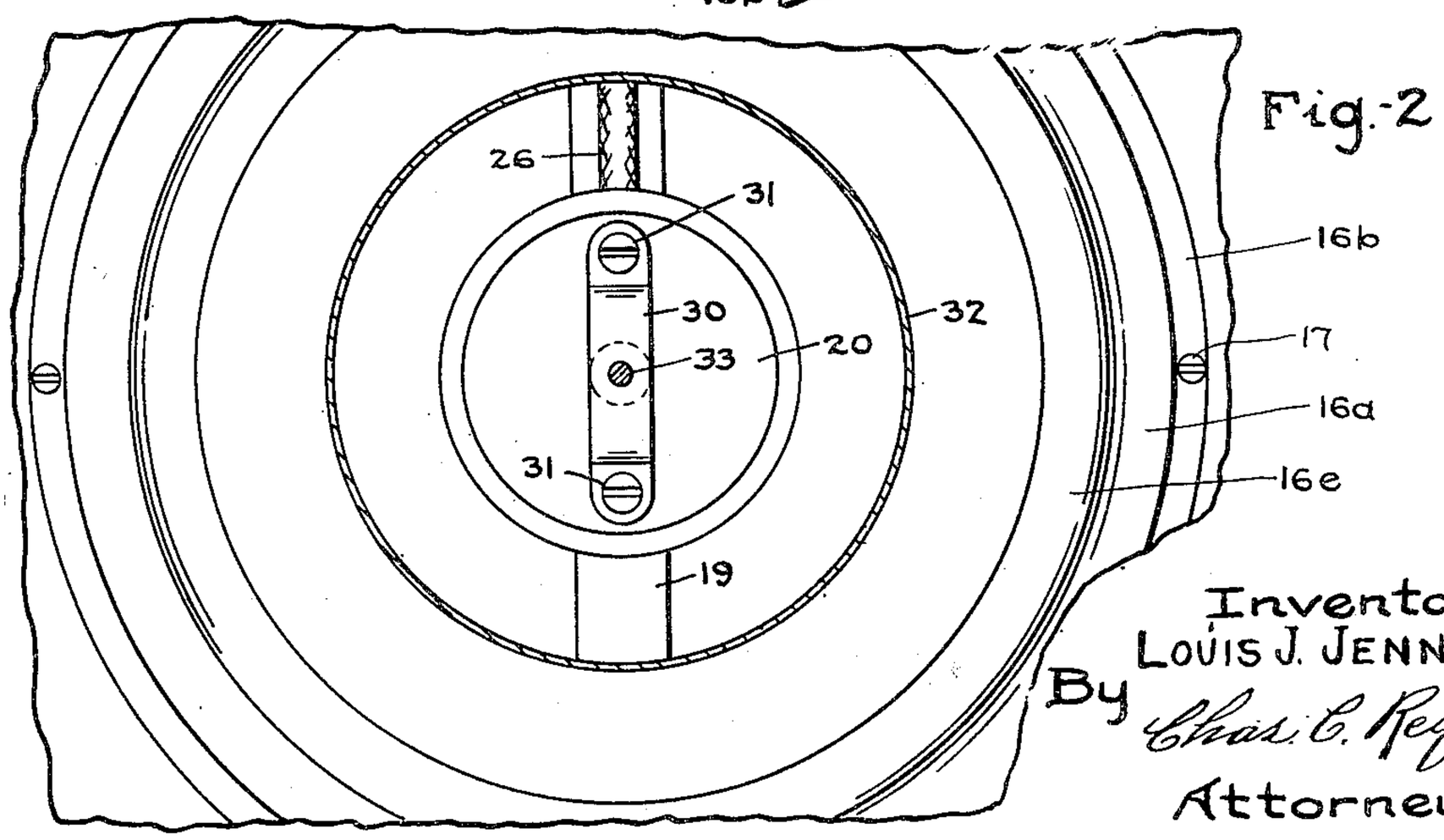

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Fig.-3

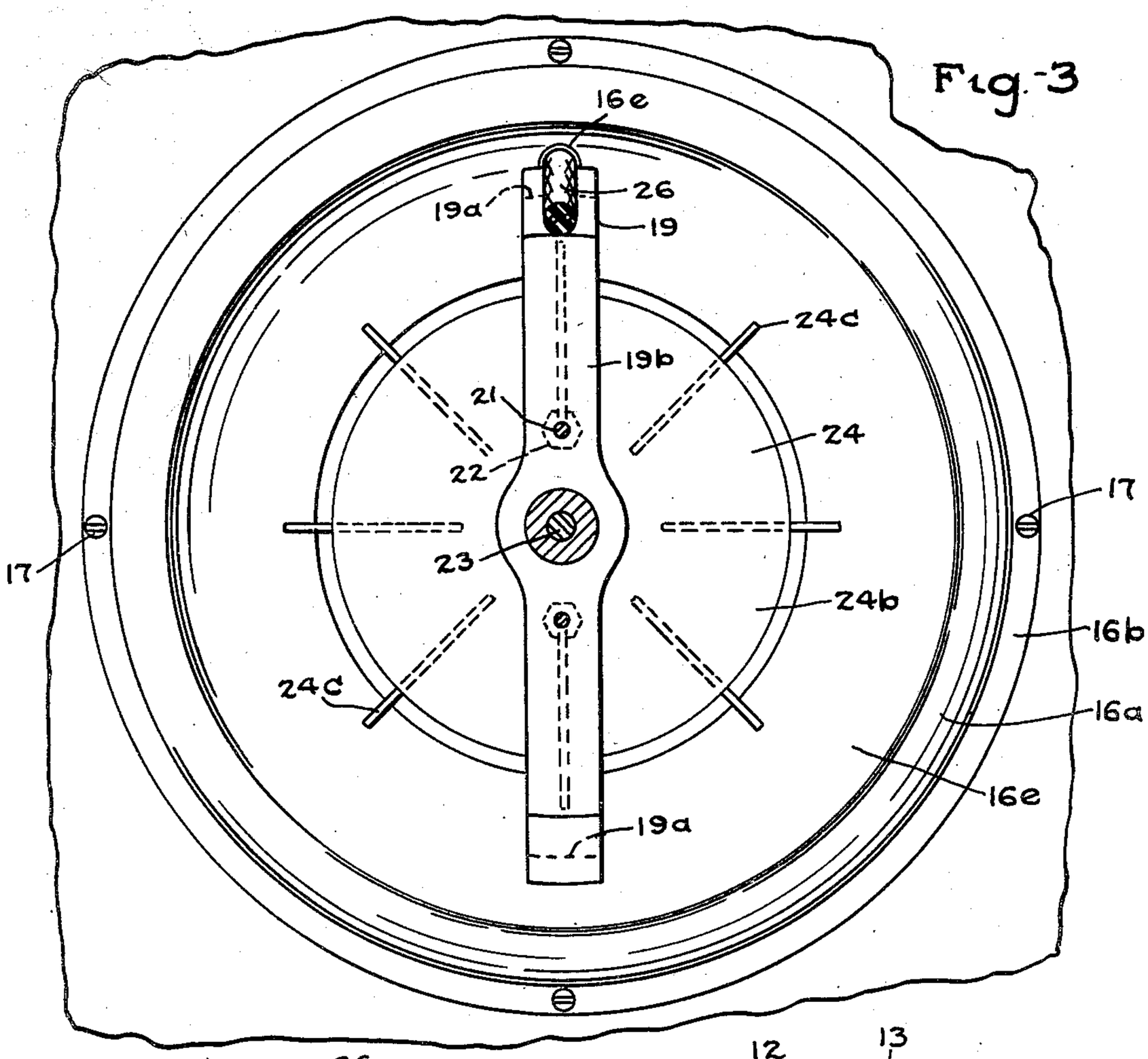


Fig.-4.

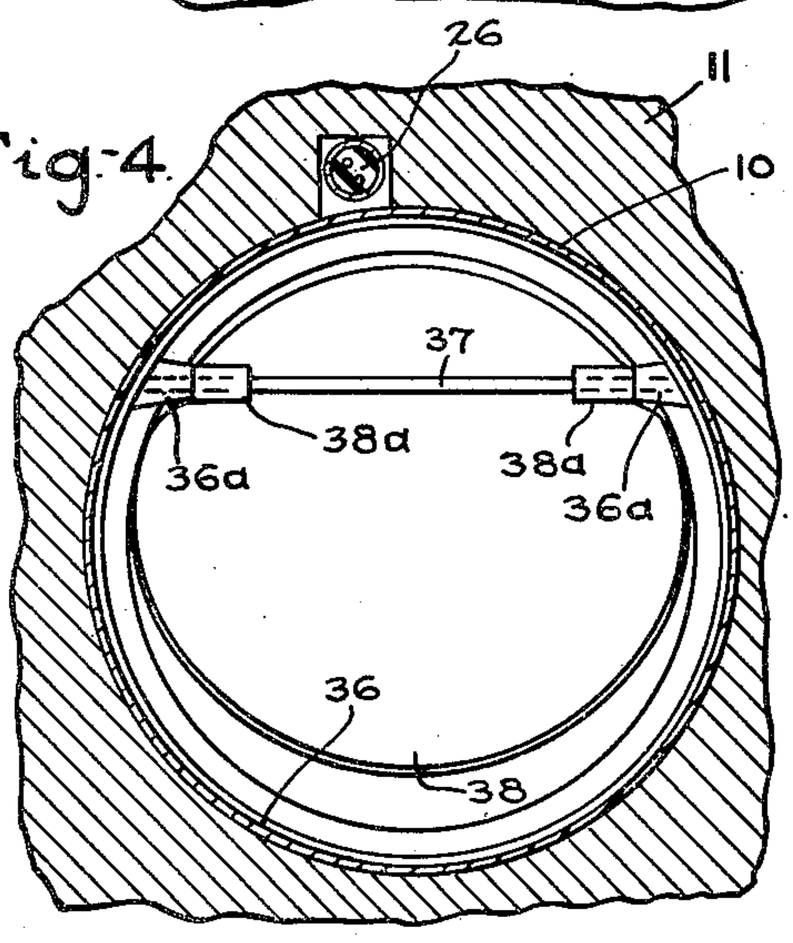
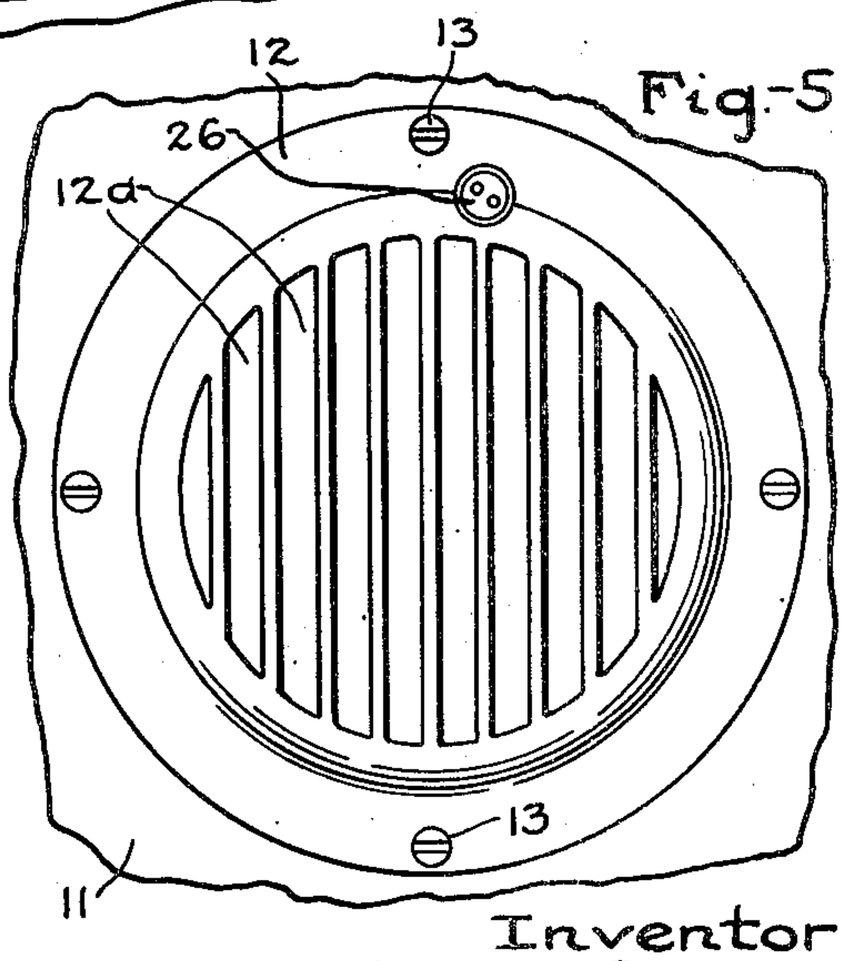


Fig.-5



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VENTILATOR

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12 Claims. (Cl. 98—116)

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This invention relates to a ventilating device and particularly to such a device disposed adjacent a passage through the wall of a room and adapted to draw fresh air from the exterior of a wall into said room or to move air from a room to the outside of said wall.

It is desirable in many rooms in business places and residences, particularly such rooms as kitchens in residences and restaurants and dining rooms in restaurants to have the air moved therefrom to keep the atmosphere in fresh condition and eliminate odors. It is also desirable to have a simple, efficient and inexpensive device which can be placed adjacent a passage through the wall of a room so that air may be drawn into or removed from said room and to have such a device protected from moisture and from which moisture may be efficiently drained.

It is an object of this invention to provide a simple and efficient ventilating device which can be produced and installed at a comparatively small expense and which can be used to draw air out of a room and which has means for regulating the amount of air so drawn.

It is another object of the invention to provide a device comprising a conduit adapted to be disposed in and extend through a passage in the wall of a room, means in said conduit for closing or partially closing the opening therethrough, a member disposed at and secured to the outer side of said wall, a motor carried by said member, a fan operated by said motor and disposed within said member, together with a casing surrounding said motor and cooperating with said member in the disposition of moisture.

It is more specifically an object of the invention to provide a ventilating device comprising a conduit adapted to be disposed in and extend through a passage through the wall of a room, said conduit preferably being adjustable to suit various thicknesses of walls, an annular member at the outer side of said wall surrounding said conduit and into which said conduit projects slightly, said annular member having an inner wall with an outer concave surface extending downwardly and outwardly at its lower end, a bracket secured to said inner wall, a motor supported on said bracket at the outer side thereof having a driving shaft, a fan secured to said driving shaft at the inner side of said bracket, and a casing preferably substantially of bell shape surrounding said motor and having a free edge extending a short distance into said annular member.

It is still further an object of the invention to provide such a device as set forth in the above

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paragraph, said conduit having a damper therein for closing the passage therethrough or regulating the size thereof, and a grill disposed in front of said conduit at the inner side of said wall.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a view in central vertical section through a device;

Fig. 2 is a vertical section taken substantially on line 2—2 of Fig. 1, as indicated by the arrows;

Fig. 3 is a vertical section taken substantially on line 3—3 of Fig. 1, as indicated by the arrows;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 1, as indicated by the arrows; and

Fig. 5 is a view in elevation as seen from the inner side of the wall.

Referring to the drawings, a device is shown comprising a conduit 10 adapted to be disposed in a passage formed through a wall 11 of a building, which wall preferably will be an outer wall. While conduit 10 could be variously formed, in the embodiment of the invention illustrated it is shown as cylindrical and having a peripheral flange 10*a* engaging the inner side of wall 11. A member 12 of plate form is provided, and while this could be of various shapes, it is shown as substantially circular, the same extending outwardly of flange 10*a* and being secured to the inner side of wall 11 by suitable screws or other fastening means 13. Member 12 at its portion in front of conduit 10 is provided with a plurality of vertical slots 12*a* so that it forms a grill. Conduit 10 extends to the outer side of wall 11 and has its outer end surrounded by a portion or member 14 fitting thereon, which portion is slidable longitudinally of conduit 10 and can be moved and positioned to fit various thicknesses of walls. Member 14 preferably has a flared outer end 14*a*. An annular member 16 is provided and while this might be variously made, it is illustrated as formed from sheet metal. Member 16 has an outer wall 16*a* with an outer convex surface which has its inner portion disposed substantially at right angles to the inner side of wall 11. As shown in Fig. 1, surface 16*a* at its top slopes downwardly and outwardly from wall 11. Wall 16*a* has a peripheral flange 16*b* engaging wall 11 and secured thereto by suitable fastening means, such as the screws 17. Member 16 has an inner wall 16*c* with an outwardly directed concave surface, wall 16*c* meeting outer wall 16*a* at

a comparatively sharp angle and substantially in line. Inner wall 16*c* extends to member 14 and has a short cylindrical flange 16*d* fitting about member 14 inwardly of the flared portion 14*a*. It will be noted that as shown in Fig. 1, inner wall 16*c* extends downwardly and outwardly at its lower side. A bracket 19 is provided, and while this might be variously formed, in the embodiment of the invention illustrated, it is shown as a bar or strip extending across member 16 diametrically thereof and having end flanges 19*a* seated against inner wall 16*c* and secured thereto in any suitable manner, as by welding. The ends of bracket 19 extend outwardly in converging relation and said bracket has a vertical central portion 19*b* to which a motor 20 is secured by bolts 21 and nuts 22. Motor 20 has a driving shaft 23, and a fan 24 has a hub 24*a* secured to shaft 23 in any suitable manner, as by the set screw 25. Fan 24 has a rear plate 24*b* of circular form, to which are secured a plurality of blades 24*c* extending inwardly from plate 24*b*. Fan 24 is disposed within member 16. Conductors or a conductor-carrying cable 26 extends from motor 20 along the upper side of bracket 19 to an opening 16*e* in the top of inner wall 16*c* to an outlet fixture 28 from which said cable 26 can extend into an opening in wall 11. A bracket 30 is secured to the outer end of motor 20, the ends of which are secured to said motor by screws 31. Bracket 30 has an offset central portion of curved form against which seats the central portion of a casing 32 secured to bracket 30 by the screw 33 and nut 34. Casing 32 surrounds motor 20 and is of substantial bell shape, the same having an outwardly flaring edge portion with its free edge extending a short distance within inner wall 16*c*. Motor 20, fan 24, casing 32 and member 16 are arranged substantially coaxially with conduit 10. A flanged ring 36 is secured in conduit 10 intermediate the ends thereof in any suitable manner, as by welding, said ring having bosses 36*a* at opposite sides thereof in which is secured a rod or shaft 37 on which a damper or diaphragm 38 is carried, said damper having lugs 38*a* journaled on shaft 37. Damper 38 is so constructed that it will normally move to closed position by gravity.

In operation motor 20 will be operated by turning on a suitable switch and fan 24 will be driven. Air will be drawn from the room to be ventilated through members 10 and 14. The damper or valve 38 will be swung open a distance determined by the strength of the current of air created by fan 24. As stated, when fan 24 is inoperative, valve 38 will move to closed position. The air drawn from the room is discharged by fan 24 through the annular opening between casing 32 and member 16. The motor is disposed outwardly of the fan so that the air taken from the room does not pass over the motor. Dirt, dust, etc. from the room is thus not deposited on motor 20. The motor 20 is also disposed at the outer side of the wall so that should any combustion occur from over-heating or other reason, a fire will not be started in the building. Inner wall 16*c* is arranged so that any moisture will pass to the lower side thereof and will drain outwardly and downwardly and will drop away from wall 11. Any moisture coming through conduit 10 will be directed by the flared end 14*a* into the inner wall 16*c*. Anything thrown out by the blades of fan 24 will also pass into the enclosure of inner wall 16*c* and will be directed outwardly and downwardly by said inner wall. The motor is protected from the elements by casing 32 and

it will be noted that the free edge of this casing extends a short distance into member 16. No rain or snow can thus reach motor 20 or fan 24 and any rain or moisture deposited on or draining from casing 32 will be discharged onto the outer portion of inner wall 16*c* and will be directed outwardly and downwardly thereby and away from wall 11. The device is designed to remove smoke, stale air, odors, etc. from kitchens or other rooms. A comparatively small conduit is necessary passing through the wall and yet the device discharges a large volume of air. It has a larger discharge outlet area than the conventional blower and works against small static pressure. The damper 38 prevents any air currents entering the room from the outside. The annular opening between casing 32 and member 16 relieves any air pressure which might be caused by a strong wind. The motor and fan being on the outer side of the building, the device operates quietly and any sound is not carried into the building by air currents. The device is so designed that it can be mounted either in a vertical wall or in the ceiling with equal facility. A sealed joint is preferable between portion 16*c* and 14. The members 16 and 32 can be conveniently spun from metal such as aluminum. If desired, the motor 20 could be intermittently operated by well known commercial means. The device has been amply demonstrated in actual practice and found to be very successful and efficient.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:

1. A ventilating device having in combination, a conduit adapted to be disposed in a passage extending through a wall and extending through said passage and projecting at one side thereof, an annular member disposed against said wall at said end having an inner wall into which said conduit extends, said inner wall having a concave surface sloping downwardly to its outer edge at its bottom, a bracket secured to said inner wall, a motor mounted on said bracket and having a driving shaft, a fan mounted on said shaft and disposed within said annular member, and a casing of general semi-spherical shape surrounding and coaxial with said motor having an annular wall extending laterally a short distance into but having its edge spaced from said inner wall, said casing adjacent said annular member having a flaring portion with an outer concave surface whereby moisture will drain from the bottom portion of said casing to said inner wall and will be directed outwardly by said inner wall.

2. A ventilating device having in combination, a conduit adapted to be disposed in and extend through an opening in a wall, said conduit projecting at the outer side of said wall, an annular member disposed at said outer side and disposed outwardly of said passage and conduit, said conduit having a flared outer end extending a short distance into said annular member, said annular member having an inner wall with a concave surface, thus extending downwardly and outwardly at its lower side, a bracket comprising a bar extending across said annular member and secured to said inner wall, a motor secured to said bracket

at the outer side thereof having a driving shaft, a fan secured to said driving shaft at the inner side of said bracket and disposed within said annular member, a substantially bell-shaped casing surrounding said motor, said casing, motor and fan being substantially co-axial with said conduit, said casing having a free edge extending a short distance within said annular member and spaced from said inner wall whereby moisture can drip from said casing at its lower portion to said inner wall and will be directed outwardly and downwardly by the latter.

3. A ventilating device having in combination, a conduit adapted to be disposed in and extend through a passage through a wall, a swingable damper disposed in said conduit, an annular member of sheet metal surrounding the outer end of said conduit and having a flange disposed against the outer side of said wall, means securing said flange to said wall, said member having an outer wall with an outer convex and outwardly converging surface and having an inner wall with a concave surface, thus extending outwardly and downwardly at its lower end to said outer wall, said walls meeting and being connected in substantially a circular line, a strip bracket secured to and extending across said inner wall, a motor secured to the outer side of said bracket and having a driving shaft, a fan secured to said driving shaft at the inner side of said bracket, a bracket secured to the outer side of said motor and a cup-shaped casing secured to said latter bracket surrounding and coaxial with said motor and having a flaring free edge extending a short distance into said annular member.

4. A ventilating device having in combination, a conduit adapted to be disposed in and extend through a passage through a wall, a swingable damper disposed in said conduit, an annular member of sheet metal surrounding the outer end of said conduit and disposed against the outer side of said wall, means securing said member to said wall, said member having an outer wall with an outer convex outwardly converging surface and having an inner wall with a concave surface extending outwardly and downwardly at its lower end to said outer wall of said member, a strip bracket secured to and extending across said inner wall, a motor secured to the outer side of said bracket and having a driving shaft, a fan secured to said driving shaft at the inner side of said bracket, conductors extending to said motor, said inner wall having an opening therethrough through which said conductors extend to an opening in said wall, a substantially bell-shaped casing carried by said motor and disposed substantially coaxially therewith, said casing having a free edge extending a short distance into said annular member.

5. A ventilating device having in combination, a conduit adapted to be disposed in a pasage extending through a wall and extending through said passage and projecting at one side thereof, an annular member disposed against said wall at said end, means securing said member to said wall, said member having an inner wall into which said conduit extends, said inner wall having a concave surface sloping downwardly to its outer and free edge at its bottom, a motor supported by said member outwardly thereof, a fan driven by said motor and disposed within said member, and a casing surrounding said motor having a free annular edge extending into said annular member.

6. A ventilating device having in combination, a conduit adapted to be disposed in a passage extending through a wall and extending through said passage and projecting at one side thereof, an annular member disposed against said wall at said end, means securing said member to said wall, said member having an inner wall into which said conduit extends, said inner wall having a concave surface sloping downwardly to its outer and free edge at its bottom, a motor supported by said member outwardly thereof, a fan driven by said motor and disposed within said member, and a casing surrounding said motor closed at its outer portion and having a free annular edge extending into said annular member within said inner wall, said annular member having an annular outer surface which converges outwardly and thus extends outwardly and downwardly at its upper portion whereby moisture will drain onto said casing.

7. A ventilating device having in combination, a conduit adapted to be disposed in and extend through a passage through a wall, an annular member at the outer side of said wall extending about said conduit, said conduit projecting beyond said outer side, a motor supported on said member outwardly thereof, a fan driven by said motor disposed in said member, a cup-shaped casing enclosing said motor having a free annular edge spaced from and adjacent said member to form a discharge opening for air moved by said fan whereby said air does not pass over said motor, said annular member having an inner wall with a concave surface converging inwardly and thus extending outwardly and downwardly at its bottom portion and said free annular edge of said casing projecting within said inner wall whereby said inner wall forms a drip ring.

8. A ventilating device for a building having an outer portion with a passage extending therethrough, having in combination, a conduit adapted to be disposed in said passage, a plate disposed in said conduit and swingable about an axis extending transversely to the axis of said conduit and at one side of the same to close more or less the passage through said conduit, an annular member secured to said portion at the outer side thereof and having an inner concave surface extending to said conduit, a fan disposed within said annular member substantially coaxially of the same and said conduit, a motor having its driving shaft secured to said fan for driving said fan, a dome-like casing secured to said motor and enclosing the same, coaxial therewith, and having a flaring free edge disposed within said concave surface of said annular member, and a support for said motor secured to said concave surface.

9. A ventilating device having in combination, a conduit adapted to be disposed in a passage extending through a vertical wall of a building, said conduit fitting in and extending through said passage, an annular member having a peripheral portion disposed against the outer side of said wall and having a free annular edge spaced from said wall, means securing said peripheral portion to said wall, said member having an inner portion with a concave surface extending from said free edge substantially to said side of said wall, a motor supported by said member and spaced outwardly axially therefrom, a fan driven by said motor and disposed within said inner portion, and a casing having a closed outer portion surrounding said motor and having an inner open side with an annular edge ex-

tending within said concave surface and adjacent said free edge of said annular member, said annular member, passage, motor and fan being substantially in axial alinement.

10. The structure set forth in claim 9, said fan being of the centrifugal type and being disposed at the outer side of said passage.

11. A ventilating device for a building having a vertical wall with a substantially horizontal passage extending therethrough having in combination, a conduit disposed in said passage and extending therethrough, an annular member secured to said wall at the outer side thereof and having an inner concave surface extending substantially to said conduit, a centrifugal fan disposed within said annular member substantially coaxially of the same and said conduit, a motor having its driving shaft secured to said fan for driving said fan, a dome-like casing secured to said motor enclosing the same, and coaxial therewith and having a free inner edge disposed within said concave surface, and a support for said motor secured to said annular member.

12. A ventilating device having in combination, a conduit adapted to be disposed in a substantially horizontal passage extending through a vertical wall of a building and extending through said passage, an annular member secured to the outer side of said wall and having an annular concave surface coaxial with said passage and extending radially outward and

away from said wall, a motor, a support for said motor secured to said member, said motor being disposed outwardly of said member, a centrifugal fan driven by said motor and disposed outwardly of said conduit and between the same and said motor, and a dome-shaped casing enclosing said motor having an open inner side with an annular free edge adjacent to but spaced radially inwardly from the outer portion of said concave surface, said motor, fan and passage being in substantial axial alinement.

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