

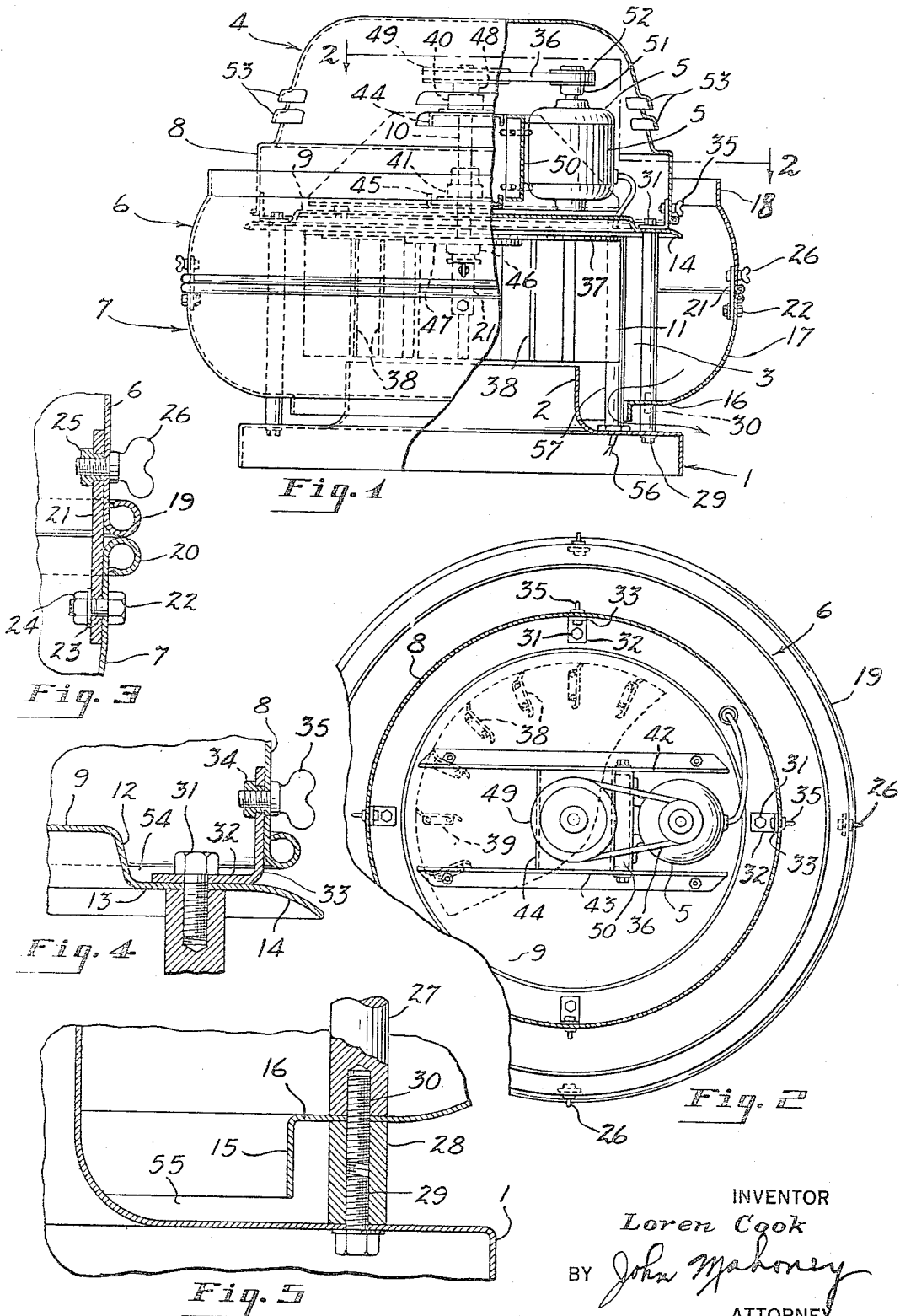
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L. COOK

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ROOF TYPE POWERED VENTILATOR

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INVENTOR
Loren Cook
BY John Mahoney
ATTORNEY

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ROOF TYPE POWERED VENTILATOR
Loren Cook, Berea, Ohio, assignor to Loren Cook
Company, a corporation of Ohio
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My invention relates to ventilators and more particularly to roof ventilators in which improved means are provided for directing air upwardly from the roof of a building.

In roof ventilators as heretofore constructed, the air is usually directed downwardly toward the roof of the building because when means are provided to direct the air upwardly away from the roof of the building, back draft dampers on the discharge side of the fan or blower are necessary to protect the ventilator from weather elements, such as rain or melted sleet or snow, when the air blower is at rest. In accordance with the present invention, I have provided a roof ventilator which is designed to eject air, such as air contaminated with grease or with acid or caustic fumes into the atmosphere away from the roof of a building. Means are also provided in my improved ventilator for draining weather elements, such as rain or melted sleet or snow, from the ventilator.

In my improved ventilator a comparatively large motor compartment is provided which is enclosed by a casing having inlet and outlet means through which air is circulated to cool the motor, the flow of which is accelerated by air forced outwardly by a fan or blower arranged within a blower compartment. In my improved structure, the motor casing has a vertically extending annular wall which is spaced inwardly from baffle means to form a path for air flowing outwardly from the blower compartment and the upper end of this wall is first turned inwardly in a substantially radial direction toward the axis of the ventilator and is then inclined upwardly and inwardly toward the axis of the ventilator to provide a dome which terminates in a substantially flat cover portion.

It is therefore an object of the present invention to provide an improved roof ventilator having a blower and means associated with the blower for directing air upwardly from the ventilator.

Another object of my invention is to provide an improved ventilator in which air is directed upwardly from the roof of a building and in which improved means is provided for preventing weather elements, such as rain, or melted sleet or snow from entering the building through the ventilator.

A still further object of my invention is to provide an improved ventilator having baffle means associated therewith for directing air upwardly away from the building and particularly air that is contaminated with grease or with acid or caustic fumes.

Other objects and advantages of my invention will be apparent as the specification proceeds.

My invention will be better understood by reference to the accompanying drawings in which:

FIG. 1 is a central sectional view of my improved ventilator showing parts in elevation;

FIG. 2 is a sectional plan view taken on a plane passing through the line 2—2 of FIG. 1;

FIG. 3 is an enlarged detail view showing the connection between the upper and lower air-directing baffles;

FIG. 4 is an enlarged detail view showing the means for connecting the motor casing to the motor-supporting plate; and

FIG. 5 is an enlarged detail view showing means for supporting the air directing baffles.

As illustrated in the drawings, my improved ventilator

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includes a base 1 which is shaped to fit over a curb extending upwardly from the roof of a building which curb may be of any desired shape, such as square or rectangular. As shown, the base terminates in an upwardly extending annular throat or duct portion 2 which is concentric with the axis of the ventilator, the parts of which ventilator are arranged to provide a blower compartment 3, a casing 4 having a motor 5 arranged therein, and upper and lower annular baffles 6 and 7 for directing air upwardly from the blower compartment, the upper baffle 6 being spaced outwardly from an annular vertical wall 8 of the motor casing to provide a discharge passage for air between the motor casing and the upper baffle.

As shown in the drawings, a motor plate 9 having a central opening therein is provided for separating the motor compartment from the blower compartment and a shaft 10 arranged in the motor compartment extends through the central opening of plate 9 and is secured to a fan or blower 11 arranged within the blower compartment. Plate 9 has a downwardly inclined annular wall 12 arranged a short distance inwardly from the vertical wall 8 of the motor casing from which wall an annular portion 13 extends radially outwardly from the axis of the ventilator and terminates in a downwardly inclined comparatively short annular baffle 14 which is arranged above the outwardly flared portion 17 of the lower baffle 7.

The lower baffle 7 has a vertically extending annular wall 15, the lower portion of which extends below the duct means 2 but is spaced from base 1 and the upper end of which first extends radially outwardly relative to the axis of the ventilator as indicated by the numeral 16 and is then flared outwardly and upwardly as indicated by the numeral 17 and terminates in a vertical or substantially vertical portion and the upper baffle 6 has a vertical or a substantially vertical lower portion which abuts the upper portion of the lower baffle 7 and is then inclined upwardly and inwardly toward the axis of the ventilator and terminates in an annular rim 18 which extends upwardly in a vertical or substantially vertical direction.

In accordance with my invention, means are provided for strengthening the baffles and for connecting the upper portion of the lower baffle and the lower portion of the upper baffle together. For strengthening the baffles, the lower portion of the upper baffle and the upper portion of the lower baffle each terminates in an annular bead 19 and 20, respectively, and for connecting the baffles together spaced straps 21 are provided, the lower portion of each of which is connected to the lower baffle by a bolt 22 having a lock washer 23 and a nut 24 secured thereto and to permit easy removal of the upper baffle to provide access to the blower compartment and the motor casing, the upper portion of each of the straps 21 has an internally threaded bushing 25 therein for receiving a thumb screw 26 which extends through an aperture in the lower portion of baffle 6 and is threaded into bushing 25.

Means are also provided for supporting the motor plate in upwardly spaced relation to throat 2 to form the blower compartment and the lower portion of baffle 7 in spaced relation to the upper wall of base 1 to provide a substantially annular outlet passage for weather elements, such as rain or melted snow or sleet. As shown, a series of upper and lower posts 27 and 28 are provided, each of which has internally threaded sockets at its upper and lower end portions as shown more particularly in FIG. 5. The lower posts 27 rest upon the base 1 with the threaded sockets in each post arranged in alignment with an aperture in the base and a screw 29 is inserted through an aperture in the base and is threaded upwardly into each post. The radially extending portion 16 of

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the lower baffle also has a plurality of apertures therein, each of which is arranged in alignment with an internally threaded upper socket in a post 28 and a plurality of threaded studs 30 are provided, each of which extends through an opening in the lower baffle and is threaded into the upper socket in a post 28. Each of the studs 30 protrudes upwardly beyond the radial portion 16 of the lower baffle and each of the upper posts 27 has an internally threaded socket in its lower end portion which is threaded downwardly upon the upwardly protruding portion of a stud 30 until the lower portion of each of the posts engages the radially extending portion of the lower baffle.

To provide a support for the motor plate, the upper end of each of the upper posts has an internally threaded socket at its upper portion for receiving a screw 31, each of which screws extend through an aperture in the horizontally extending arm 32 of an angular member and through the radially extending portion of the motor plate 9 and is threaded into the upper socket of one of the upper posts 27. The other arm 33 of each of the angular members extends upwardly and is provided with a threaded bushing 34 and the threaded portion of a thumb screw 35 extends through an opening in the vertically extending portion of the motor casing and is threaded into the bushing 34. The thumb screws 35 may be easily released to enable the upper portion of the motor casing to be removed from plate 9 to provide access to motor 5.

If desired the shaft 10 may be driven directly by the motor as shown in Patent No. 3,203,081 granted to me on August 24, 1965, in which case the motor may be secured directly to the motor plate 9 or as shown in FIGS. 1 and 2, the shaft 10 may be driven indirectly by means of a belt 36. The blower wheel 11 is arranged in the blower compartment 3 and consists to an upper plate 37 and a plurality of blades 38 which are secured to plate 37 in any desired manner, such as by screws. To provide quiet operation of the blower, each of the blades is of the air foil type and as shown is provided with a flange 39 which is riveted or otherwise secured to plate 37.

In the form of the invention shown in the drawings, the blower is driven by the shaft 10 which extends through bearings 40 and 41 which may be supported in any suitable manner. As shown, a frame is provided consisting of side walls 42 and 43 which are secured to the motor plate by suitable means, such as bolts, and between which upper and lower cross pieces 44 and 45, respectively, extend which form supports for bearings 40 and 41.

As shown in FIG. 1, the lower portion of shaft 10 extends through the cross piece 45 and plates 9 and 37 and terminates in a hub 46 to which it may be secured by any suitable means, such as a set screw, not shown. Hub 46 in turn has a flange 47 secured thereto which is also secured to plate 37 by suitable means, such as bolts, and prevents the entrance of air from the blower compartment into the motor compartment through which shaft 10 extends. The shaft 10 serves to support the blower in its desired rotatable position. The upper end of shaft 10 also extends into a hub 48 having a pulley 49 secured thereto.

The motor 5 may be secured to the supporting frame in any suitable manner. As shown, it is secured to a bracket 50 which in turn is secured to the side walls 42 and 43 of the frame and the shaft of the motor extends into a hub 51 having a pulley 52 secured thereto which is arranged in alignment with pulley 49 and belt 36 is trained around pulleys 49 and 52 which rotates shaft 10 and blower 11 when motor 5 is energized.

To provide a circulation of air for cooling the motor, an annular inlet opening may be provided for the entrance of air in the side wall of the dome as shown in my patent previously referred to or spaced louvers 53 may be formed in the side wall of the dome of the motor casing

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which have downwardly extending flanges to prevent the entrance of weather elements into the motor compartment and to provide an outlet for air from the motor casing, arms 33 of the spaced angular members extend upwardly from the radially extending portion 13 of the motor plate and form supports for the bushings 34 in which the thumb screws 35 are threaded. The thumb screws support the vertical portion of the motor casing at a spaced distance upwardly from the radial portion 13 of the motor plate 59 to thereby provide an annular opening 54 for the egress of air and as air from the blower compartment is expelled upwardly through the outlet passage between the wall 18 of the upper baffle and the vertically extending wall of the motor casing, a negative pressure is created which draws air outwardly from the motor casing at a speed corresponding to the speed at which air is expelled from the ventilator.

The downwardly extending annular wall 12 of the motor plate limits the distance that weather elements may flow into the motor casing through the opening 54 between the lower vertical portion 8 of the motor casing and the radial wall of motor plate 9 and any weather elements that are blown into this space or flow downwardly from the dome of the motor casing, such as rain, or melted snow or sleet, will flow over baffle 14 and drain on to the flaring portion 17 of the lower baffle 7 from whence it flows downwardly over the vertical flange 15 on to the upper wall of the base and then through the annular outlet passage on to the roof.

For energizing motor 5, insulated electrical conductors 56 connected to a suitable source of electrical energy extend through an opening in the base 1 and through tube 57 to the motor 5.

What is claimed is:

1. A ventilator including a base having an upper wall for application to a curb surrounding an opening in a roof which base has an upwardly extending duct means arranged in alignment with the axis of the ventilator, a motor casing having a substantially vertical wall portion, a motor arranged in the motor casing, a blower arranged below the motor casing, a shaft operatively associated with the motor and said blower for rotating the blower when the motor is energized, annular baffle means consisting of upper and lower annular baffles having contiguous beads engaging each other, means for bracing the baffles and connecting them together comprising a plurality of spaced straps arranged interiorly of the baffle means, each having a threaded bushing in its upper portion, means for locking the lower portion of each of the straps to the upper portion of the lower baffle, spaced fastening means extending through the lower part of the upper baffle, each being releasably threaded into one of said bushings, said lower baffle having a downwardly extending annular rim which extends below said duct means and is perpendicular to the upper wall of the base portion, means for supporting said motor casing and said baffle means with the rim of the lower baffle spaced a short distance upwardly from said base to provide an annular opening between the lower portion of said rim and the upper wall of said base, said lower baffle also including an annular portion extending substantially radially outwardly from its rim and an outwardly and upwardly flared portion which terminates radially outwardly from substantially the central portion of said blower, and said upper baffle being tapered inwardly from the upper portion of the lower baffle and terminating in a short vertical annular rim which is substantially parallel to and is spaced radially outwardly from the vertical portion of the motor casing to thereby provide a chamber through which air may be expelled outwardly and upwardly and through which weather elements entering between the annular rim of the upper baffle means and the lower portion of the motor casing which are liquid or become liquid may be drained downwardly upon the flaring wall of the

lower baffle and outwardly on to the base portion below the annular rim of the the lower baffle.

2. A ventilator including a base having an upper wall for application to a curb surrounding an opening in a roof which base has an upwardly extending duct means arranged in alignment with the axis of the ventilator, a motor casing including a vertically extending annular wall, and a motor plate having a central opening, an annular radial portion, and a downwardly extending annular portion which extends outwardly a short distance beyond the casing and has an outer peripheral portion which is flared downwardly from the casing, a motor arranged in the motor casing, a blower arranged below the motor casing, a shaft extending through the central opening in the motor plate and being operatively associated with the motor and said blower for rotating the blower when the motor is energized, annular baffle means consisting of upper and lower annular baffles having contiguous mating beads, means applied inside of the baffle means for bracing the baffles and connecting them together comprising a plurality of spaced straps, each having a threaded bushing in its upper portion, means for locking the lower portion of each of the straps to the upper portion of the lower baffle and spaced means extending through the lower portion of the upper baffle, each being releasably threaded into one of said bushings, said lower baffle having a downwardly extending annular rim which extends below said duct means and is perpendicular to the upper wall of the base portion, means for supporting said motor casing and said baffle means with the rim of the lower baffle spaced a short distance upwardly from the base to provide an annular opening for liquid weather elements between the lower portion of said rim and the upper wall of said base, said lower baffle also including an annular portion extending substantially radially outwardly from its rim and an outwardly and upwardly flaring portion which terminates radially outwardly from substantially the central portion of said blower and said upper baffle being spaced outwardly from the downwardly flaring portion of the motor plate and being tapered inwardly from the upper portion of the lower baffle and terminating in a short vertical annular rim that is spaced radially outwardly from and is substantially parallel to the annular vertical wall portion of the motor casing to thereby provide a chamber through which air may be expelled outwardly and upwardly and through which liquid weather elements entering between the annular rim of the upper baffle and the vertical wall of the motor casing or which fall upon the downwardly flaring periphery of the motor plate may be drained downwardly upon the flaring wall of the lower baffle and outwardly on to the base below the annular rim of the lower baffle.

3. A ventilator including a base having an upper wall for application to a curb surrounding an opening in the roof which base has an upwardly extending duct means arranged in alignment with the axis of the ventilator, a motor casing including a vertically extending annular wall and a dome-shaped cover having air inlet means therein, a motor plate having a central opening a downwardly extending wall arranged a short distance inwardly from the

vertical wall of the motor casing and a radial portion which terminates in a downwardly extending peripheral baffle which extends outwardly a short distance beyond the motor casing, a motor arranged in the motor casing, a blower arranged below the motor casing, a shaft extending downwardly through the central opening in said motor plate and being operatively associated with said blower for rotating said blower when the motor is energized, annular baffle means consisting of upper and lower annular baffles having contiguous mating beads, means arranged interiorly of the baffle means for bracing the baffles and connecting them together, said bracing means comprising a plurality of spaced straps, each having a threaded bushing in its upper portion, means for locking the lower portion of each of the straps to the upper portion of the lower baffle and spaced means extending through the lower portion of the upper baffle, each being releasably threaded into one of said bushings, said lower baffle having a downwardly extending annular rim, an annular radially extending portion and an upwardly and outwardly flaring portion which terminates radially outwardly from substantially the central portion of said blower and said upper baffle having an upwardly and inwardly flaring portion which terminates in an annular rim which is substantially parallel to the lower vertical wall portion of said casing, post means for engaging and supporting said baffle means and the radial portion of the motor plate, means associated with said post means and said motor casing for maintaining the vertical wall of said casing in spaced relation to the radial portion of the motor plate to provide an annular opening for the circulation of air through the motor casing, and said baffle means providing a chamber through which air from the duct means discharged outwardly and upwardly by said blower will increase the flow of air through the motor casing to cool the motor and will also provide a passage which is so shaped that liquid weather elements entering the chamber between the outwardly extending rim of the upper baffle and the vertical wall of said casing and liquid weather elements which flow into the opening or which drain downwardly over the dome-shaped casing and its vertical wall will flow downwardly over the flaring periphery of said motor plate and the inner wall of said baffle on to the outer flaring portion of the lower baffle and then over the downwardly extending rim on to the upper wall of said base.

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ROBERT A. O'LEARY, *Primary Examiner.*

MEYER PERLIN, *Examiner.*

W. E. WAYNER, *Assistant Examiner.*