Oct. 4, 1949. J. B. KOCH 2,483,547

BUILT-IN VENTILATOR

Filed June 27, 1946 3 Sheets-Sheet 1

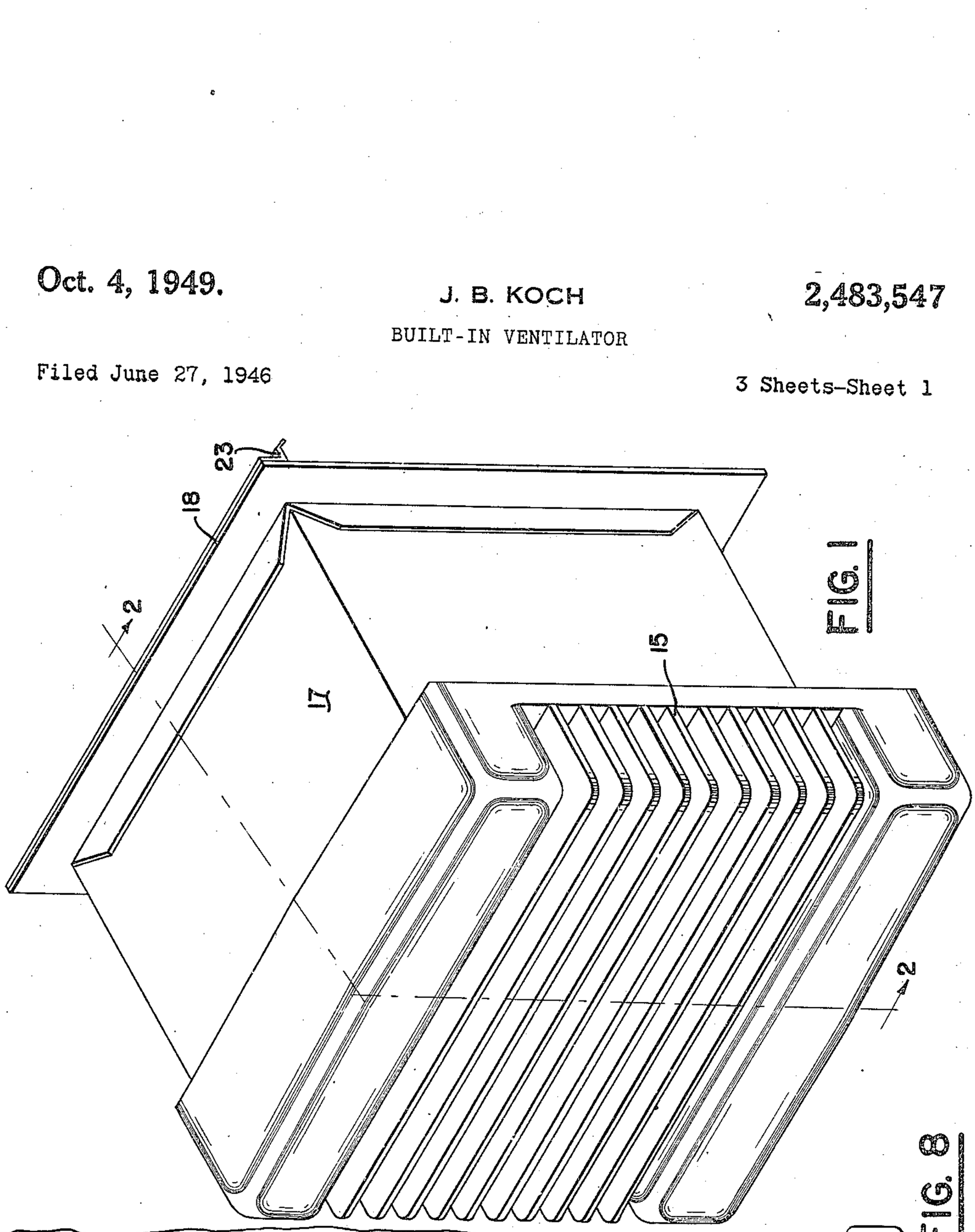

FIG. 1

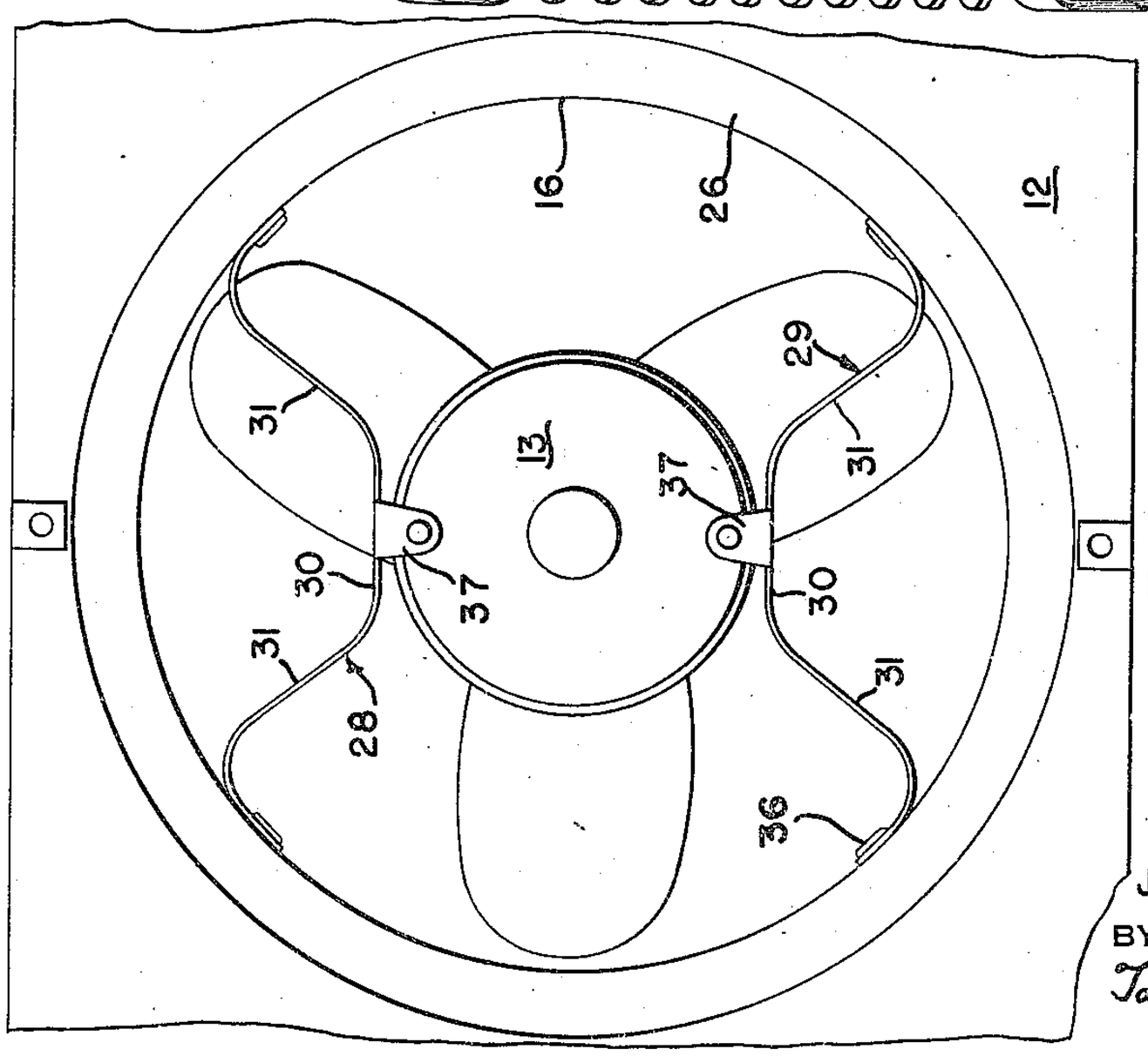

FIG. 3

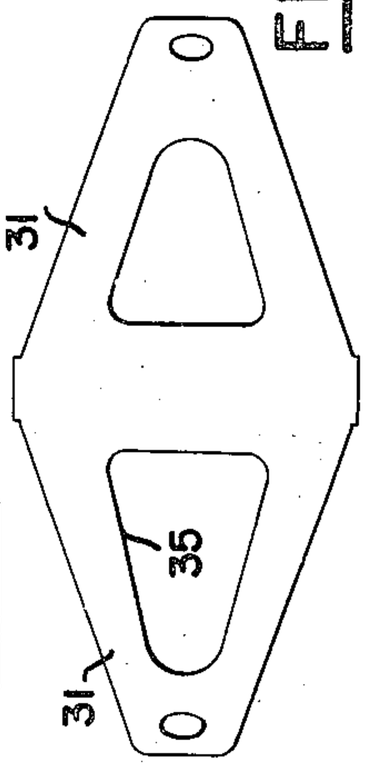

FIG. 8

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Oct. 4, 1949. J. B. KOCH 2,483,547

BUILT-IN VENTILATOR

Filed June 27, 1946 3 Sheets-Sheet 2

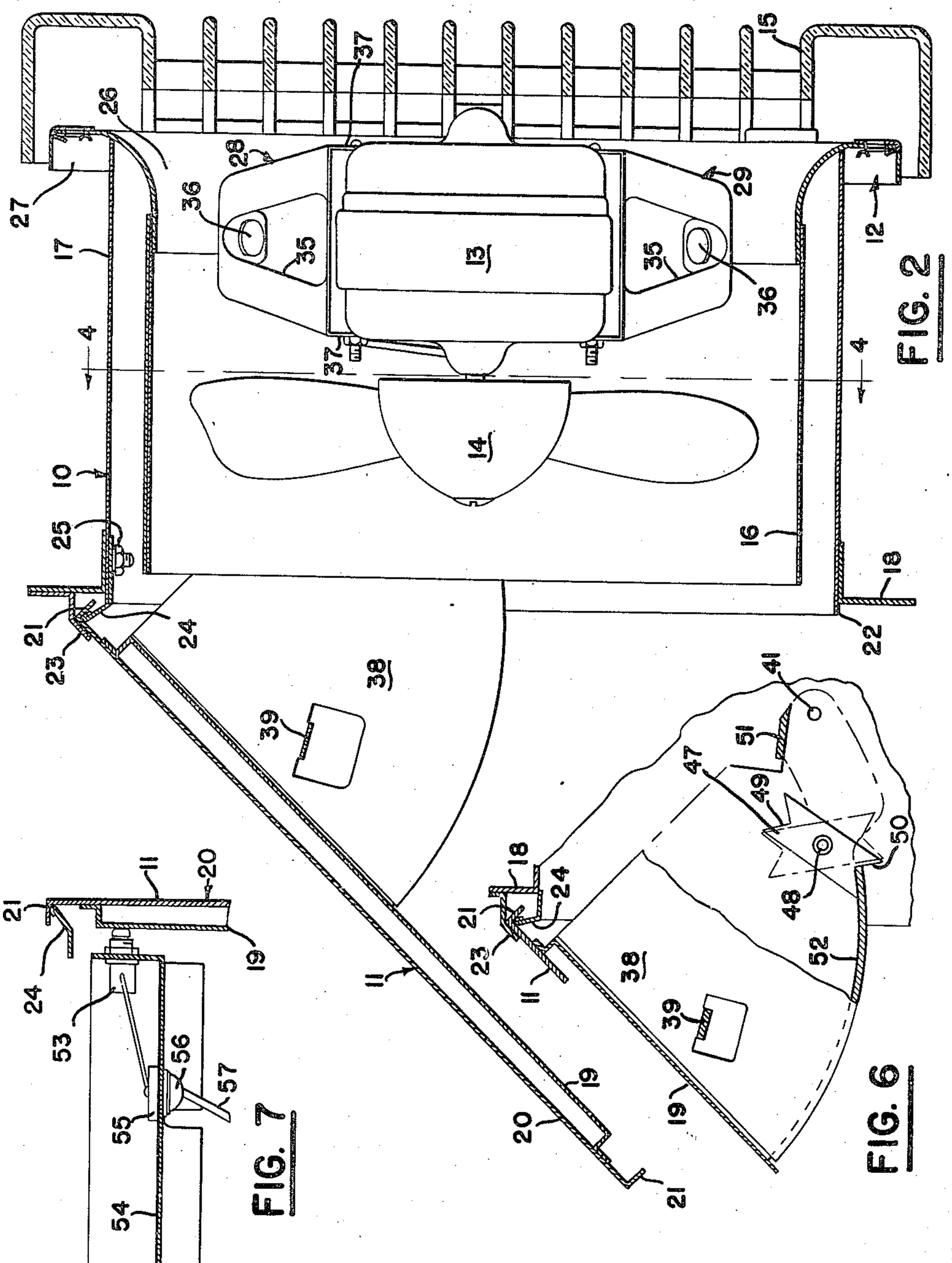

FIG. 2

FIG. 7

FIG. 6

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Oct. 4, 1949. J. B. KOCH 2,483,547

BUILT-IN VENTILATOR

Filed June 27, 1946 3 Sheets-Sheet 3

FIG. 5

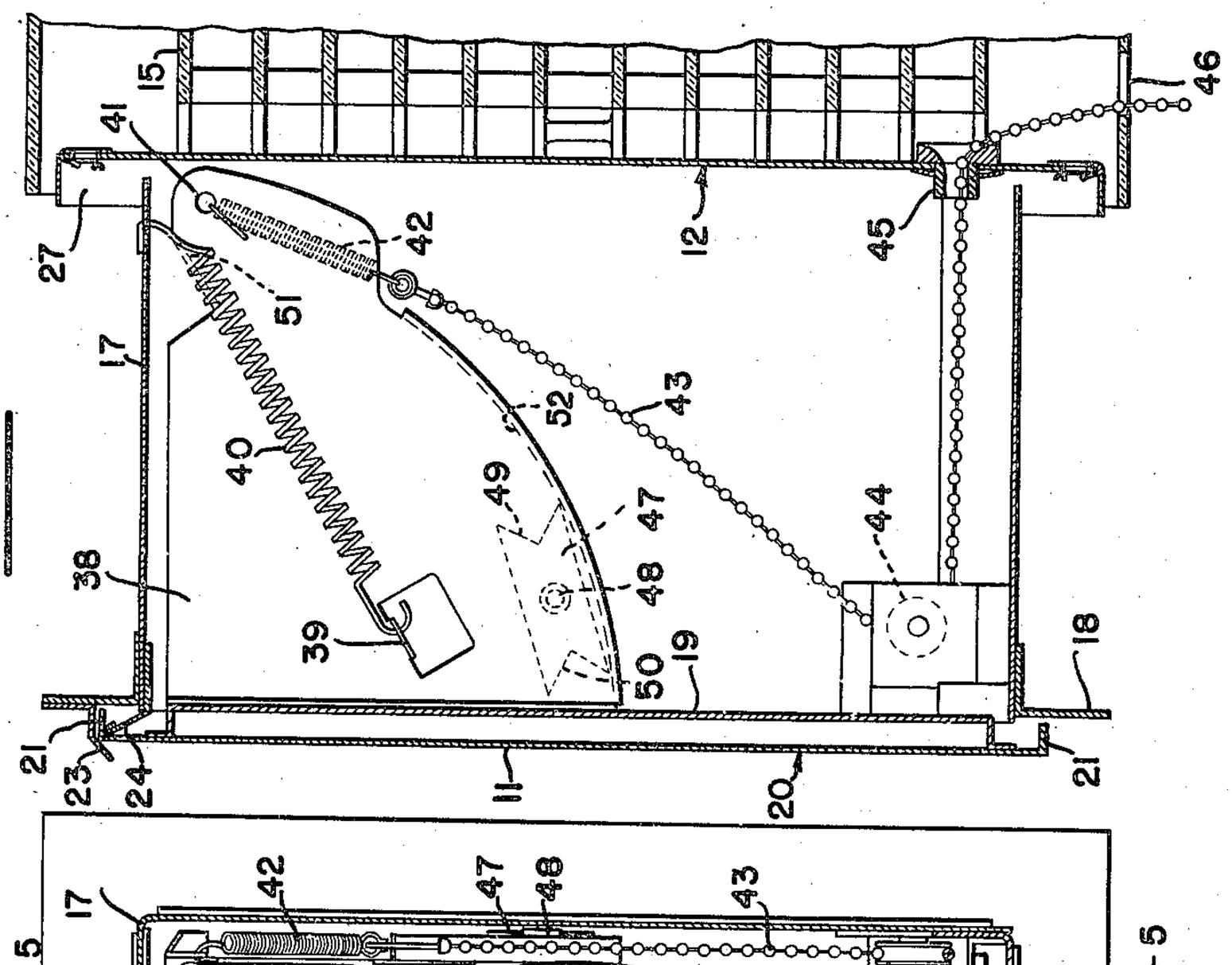
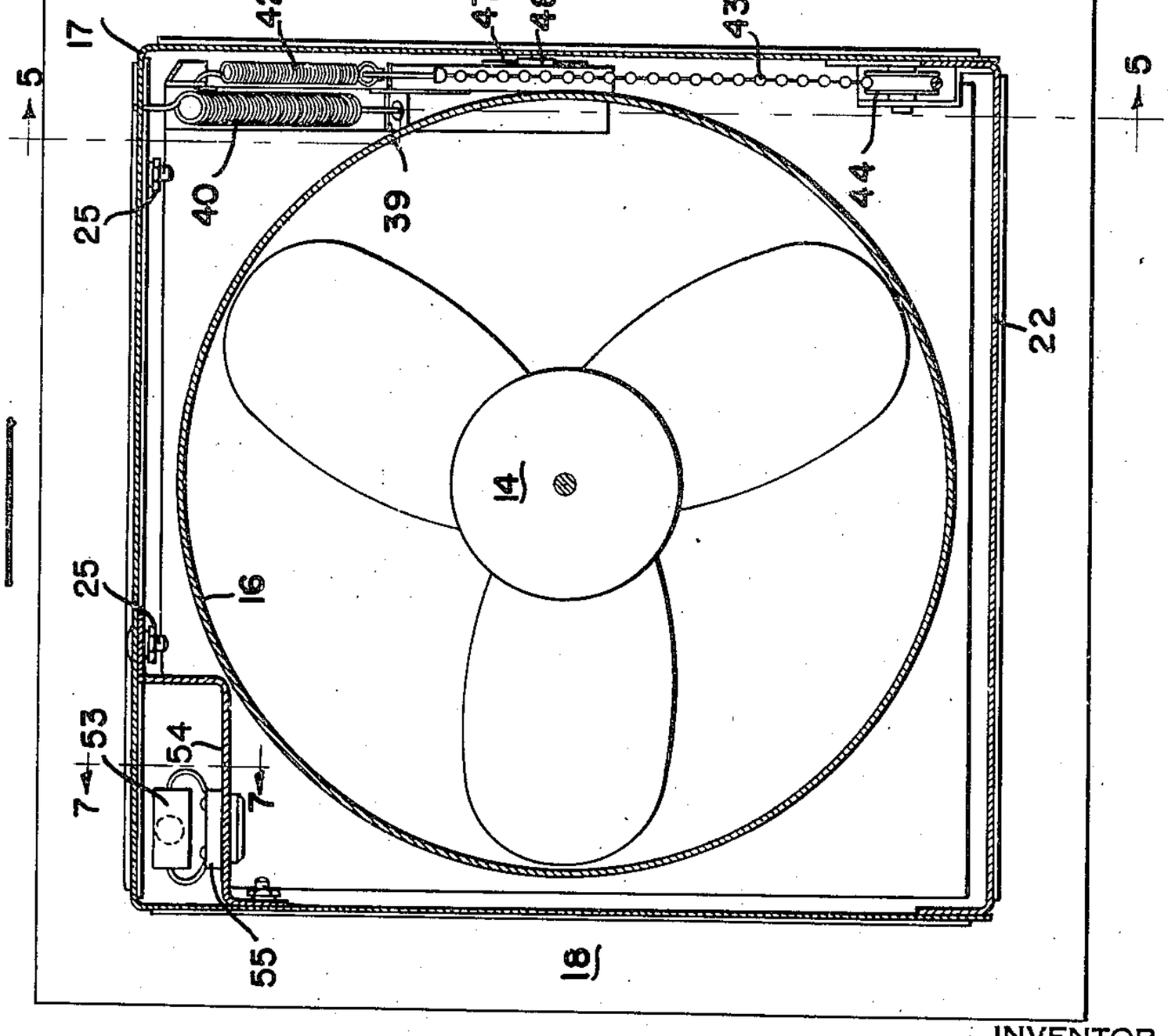


FIG. 4



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UNITED STATES PATENT OFFICE

2,483,547

BUILT-IN VENTILATOR

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5 Claims. (Cl. 98—43)

1

This invention relates to a ventilating unit adapted to be built into a wall, and is particularly for use as a ventilating fan for kitchens or other rooms for expelling vapors therefrom.

An object of the invention is to provide an improved structure of a ventilating unit for installation in the wall of a room.

Another object of the invention is to provide an improved structure for a ventilating unit having an improved weatherproof door and means of hingedly mounting the same.

Another object of the invention is to provide an improved structure for a ventilating unit wherein the unit is adapted for mounting in walls of various thickness.

Another object of the invention is to provide an improved structure for a ventilating unit wherein the door which opens on the weather side of the unit is provided with an improved form of latch which operates at one time to hold the door in open position and upon a second actuation, to allow the door to close.

Still another object of the invention is to provide an improved structure for a ventilating unit wherein the motor for the ventilating fan is carried upon a resilient motor mounting of an improved and simplified type for absorbing vibration and noise from the motor in the fan.

Further objects and advantages will become apparent from the drawings and the following description.

In the drawings:

Figure 1 is a perspective three-quarter front view of the device of this invention.

Figure 2 is a vertical cross-sectional view taken along line 2—2 of Figure 1.

Figure 3 is an end elevational view of the device illustrated in Figure 2 as taken from the right-hand side of the device illustrated therein but with the grille member removed.

Figure 4 is a vertical cross-sectional view taken along line 4—4 of Figure 2.

Figure 5 is a vertical cross-sectional view taken along line 5—5 of Figure 4.

Figure 6 is a partial cross-sectional view illustrating the latch for holding the weather door in open position.

Figure 7 is a cross-sectional view taken along line 7—7 of Figure 4 illustrating the switch for controlling the motor of the unit.

Figure 8 is a plan view of the motor mounting of the fan motor.

In this invention, the device consists of a wall-box section 10 adapted to be installed into a wall from one side thereof and provided with

2

a weather door 11 for closing the opening provided by the wall-box section. A wall plate section 12 which supports the motor 13 and the fan 14 is adapted for installation from the opposite side of the wall and has a decorative grille 15.

The wall plate section 12 has a tubular member 16 that telescopes within the generally rectangular section 17 of the wall-box section 10 to provide for placement of the unit in walls of different thickness.

The wall-box section 10 consists of the rectangular tubular section 17 which has the angle flange 18 extending around the same at one end thereof. The angle flange 18 faces against one side of the wall in which the unit is installed, preferably an exterior wall surface, and the tubular section 17 is suitably secured to the opening framed in the wall in which the unit is placed.

The weather door 11 is a substantially pan-shaped member reinforced with a smaller pan-shaped member 19 suitably attached to the main pan-shaped member 20. The flange 21 around the door 11 is adapted to be positioned in close proximity to the face of the flange 18 and prevents entrance of weather elements into the tubular member 17. The tubular member 17 has the end 22 thereof extending beyond the face of the flange 18 to prevent capillary movement of the weather elements across the face of the flange into the square section 17.

The weather door 11 is hinged along the top edge of the wall-box section 10 by having the flange 21 thereof contained between a drip molding 23 and a support angle 24, the support angle 24 being secured to the member 17 by the nuts 25. As will be seen in Fig. 2, the weather door 11 thus hinges upon the upper edge of the support member 24 in the corner formed by the flange 21, and the drip molding 23 prevents removal of the flange 21 from upon the support member 24 even when the door is in closed position, as illustrated in Fig. 5.

The wall plate section 12 consists generally of the tubular member 16 that has the throat member secured thereto, and which terminates in the flange portion 27 which is secured to the inside of the wall in which the unit is installed by means of suitable fastenings.

The grille member 15 is secured to the flange portion 27 of the throat 26 by means of fastenings in a conventional manner.

The electric motor 13 is mounted within the throat 26 upon a pair of resilient sheet metal support brackets 28 and 29, more particularly

illustrated in Figures 2, 3 and 8. Each of the support brackets **28** and **29** consists of a formed sheet-metal member of thin-gauge metal with substantially the contour of a U-shaped member with the ends of the legs of the U-shaped member formed on a radius outwardly of the member. Thus, each of the mounting members **28** and **29** consists of a base portion **30** with the extending legs **31**.

The legs **31** of the motor mounting members **28** and **29** are provided with triangular-shaped openings **35** whereby the legs **31** consist of two converging resilient leg portions.

The motor mounting members **28** and **29** are secured to the throat **26** by means of suitable bolts **36**, or any other usual type of fastening device. The base portion **30** of the motor mountings **28** and **29** is provided with ears **37** formed at substantially right angle to the base portion **30**. Screws or bolts pass through the ears **37** for attaching the motor **13** to the motor mountings **28** and **29**.

The weather door **11** of the ventilating unit is adapted to be held in open position, as illlustrated in Figure 1, by a lock mechanism more particularly illustrated in Figures 4, 5 and 6.

The weather door **11** is provided with a quadrant **38** attached to the door **11** along one vertical edge thereof, as illustrated in Fig. 4. An ear **39** is formed outwardly in the quadrant **38** and a tension spring **40** extends between the ear **39** and an opening in the casing member **17** for applying spring tension to the door **11** for holding the same in closed position, as illustrated in Fig. 5.

The free end of the quadrant **38** has a hole **41** to receive one end of a spring **42** that has the opposite end thereof connected to a pull-chain **43** that passes over a roller **44** and through a grommet **45** for placing the chain adjacent an inside wall in which the ventilating unit is mounted. The chain **43** passes through an opening **46** in the frame of the grille **12** so that the chain may be grasped to open the door **11**.

A rotating lock **47** is pivotally mounted to the side wall of the frame member **17** upon the pivot bearing **48** and is provided with V-shaped notches **49** and **50** in opposite ends thereof.

The locking device is adapted to operate in such a manner that one pull upon the chain **43** will cause the door **11** to open and operate the lock **47** so as to hold the door in the open position illustrated in Fig. 2, and a second pull on the chain **43** will cause the lock **47** to release the door **11** to allow it to return to the closed position under action of the spring **40**.

The quadrant **38** is provided with an ear **51** extending toward the wall of the frame member **17** which provides the actuating member for the lock **47**.

When the chain **43** is pulled downwardly, the door **11** and the quadrant **38** will be hinged outwardly and the radius of movement of the forward edge of the ear **51** is such that it will strike the upper prong of the notch **49** in the lock **47** to rotate the lock in a counter-clockwise direction to substantially the full-line position thereof indicated in Fig. 6 so that release of the pull-chain **43** will allow the flanged edge **52** on the quadrant **38** to engage the lower prong of the notch **50** until the upper prong of the notch **50** engages the flange **52** to lock the member **47** against further counter-clockwise rotation, and thus hold the door **11** in open position, as illustrated in Figure 6.

To close the door **11**, the pull-chain **43** is again pulled downwardly, causing the door **11** to rotate in a clockwise direction and bring the forward edge of the ear **51** against the lower prong of the notch **49** of the lock **47** as indicated by the dot-dash line in Fig. 6, to rotate the member **47** in a counter-clockwise direction and place the same in the dot-dash position indicated in Fig. 6, the prongs of the notch **50** at this time clearing the flange **52**. The outward movement of the door **11** is limited by the ear **51** striking the member **47** near the pivot bearing **48**. Release of the pull-chain **43** will now allow the forward edge of the flange **52** to engage the left-hand side of the member **47** during closing movement of the door **11** and the quadrant **38** to place the member **47** in the position indicated in Fig. 5, at which time the device is ready for a further opening movement of the door.

Opening and closing of the door **11** will cause the electric motor **13** to start and stop, respectively. For this purpose an electric switch **53** is mounted adjacent one edge of the door **11** and is carried upon a housing member **54** that also includes a receptacle **55** adapted to receive the prongs of a companion plug **56** on the electric cord **57** for the motor **13** to thus connect the switch **53** in series with the electric motor **13**. The switch **53** is of a type that when in one position, with the door **11** closed, the switch will open the electric circuit through the motor **13** and when the door **11** is opened to release the spring-actuated mechanism of the switch **53**, the switch will close to complete electric circuit through the motor **13**. Thus, opening and closing of the door **11** also controls operation of the motor **13**.

While the apparatus disclosed and described herein constitutes a preferred form of the invention, yet it will be understood that the apparatus is capable of alteration without departing from the spirit of the invention, and that all modifications that fall within the scope of the appended claims are intended to be included herein.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a ventilating unit for installation in a wall, a quadrilateral wall-box section open at opposite ends thereof, a door for closing one end of said wall-box, and an air-handling device for disposition within said wall-box consisting of a circular tubular member having an electric motor and fan mounted therein for moving air therethrough, said tubular member being telescopically received within said wall-box and having a decorative grille on one end thereof, and an actuating member for said door carried thereon and positioned between said wall box and said tubular member, said actuating member including a pull-chain for operating said member and disposed between said wall box and said tubular member and terminating exteriorly of the ventilating unit on one side of the wall in which it is installed, a cam member rotatably carried on said wall-box adjacent said actuating member, said actuating member having means thereon to engage and operate said cam member to move the same into position for engagement by said actuating member to hold said door in open position, said last-mentioned means being also adapted to engage said cam member to operate the same to release said actuating member upon a second operation thereof.

2. In a ventilating unit for installation in a wall, a quadrilateral wall-box open at opposite ends thereof, a door for closing one end of said

box, a fan unit within said box for moving air therethrough, and means for opening and closing said door, said means consisting of a bracket secured along one edge of said door and extending into said box, spring means for closing said door, and a lock for holding said door in open position, said lock consisting of a rotatable member having forked opposite ends, means on said bracket for engaging one of said forked ends to rotate said rotatable member to position the opposite forked end thereof in alignment for engagement by means extending from said bracket to hold said door in open position thereby.

3. In a ventilating unit for installation in a wall, a quadrilateral wall-box open at opposite ends thereof, a door for closing one end of said box, a fan unit within said box for moving air therethrough, means for opening and closing said door, said means consisting of a bracket mounted on said door along one edge thereof, spring means for closing said door, a projection extending outwardly of said bracket, a rotatable member having forked opposite ends adjacent said bracket and disposed in the path of arcuate movement of said projection, and a pull-string for operating said door to cause said projection to engage one end of said forked member to place the same in position for engagement of the opposite end of the forked member by said bracket to thereby hold the door in open position.

4. In a ventilating unit for installation in a wall, a quadrilateral wall-box open at opposite ends thereof, a door for closing one end of said box, a fan unit within said box for moving air therethrough, means for opening and closing said door, said means consisting of a bracket mounted on said door along one edge thereof, spring means for closing said door, a projection extending outwardly of said bracket, a rotatable member having forked opposite ends adjacent said bracket and disposed in the path of arcuate movement of said projection, and a pull-string for operating said door to cause said projection

to engage one end of said forked member to place the same in position for engagement of the opposite end of the forked member by said bracket to thereby hold the door in open position, said first end of said forked member being engaged by said projection upon a second actuation of said pull-string for positioning said member with the opposite forked end thereof out of engagement with said bracket for return to its initial position thereby upon release of the pull-string.

5. In a ventilating unit, a door, and an actuating means operably associated with said door for opening and closing the same, said means consisting of a bracket secured along one edge of said door and extending into the ventilating unit, spring means for closing said door, and a lock for holding said door in open position, said lock consisting of a rotatable member having forked opposite ends, means on said bracket for engaging one of said forked ends to rotate said rotatable member to position the opposite forked end thereof in alignment for engagement by means extending from said bracket to hold said door in open position thereby.

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