March 13, 1956 L. L. SMITH 2,737,876

VENTILATOR STRUCTURE

Filed Dec. 17, 1952

Fig. 1

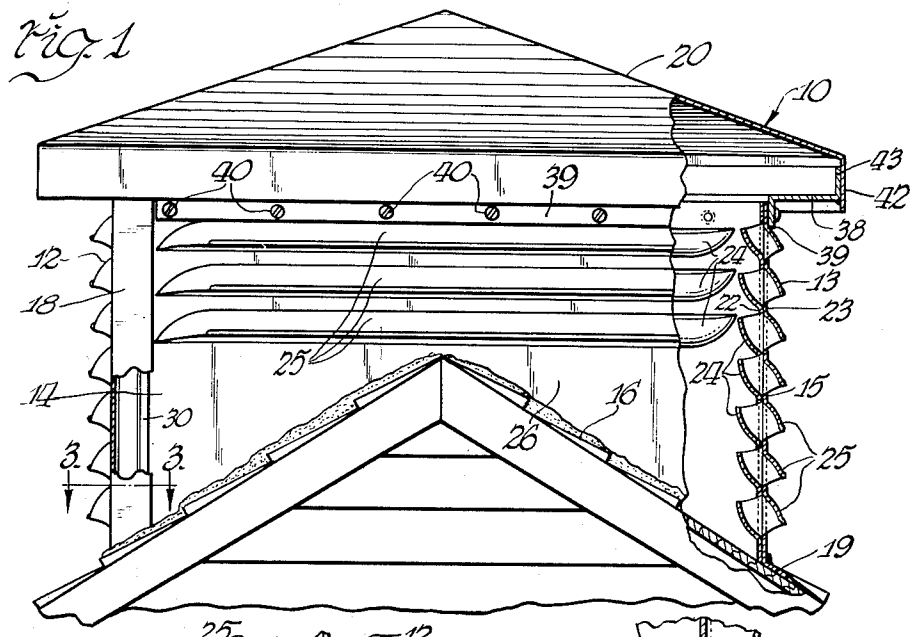


Fig. 2

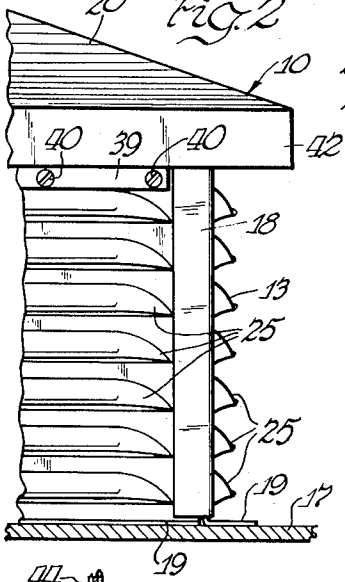


Fig. 3

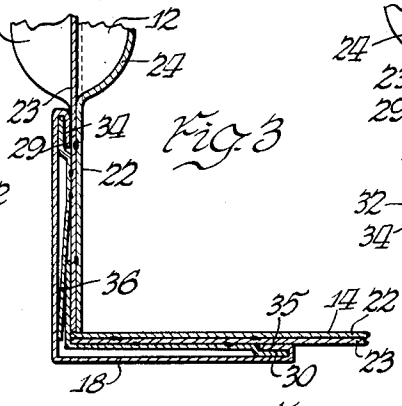


Fig. 4

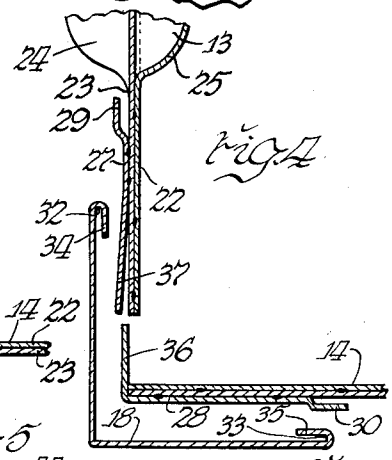


Fig. 5

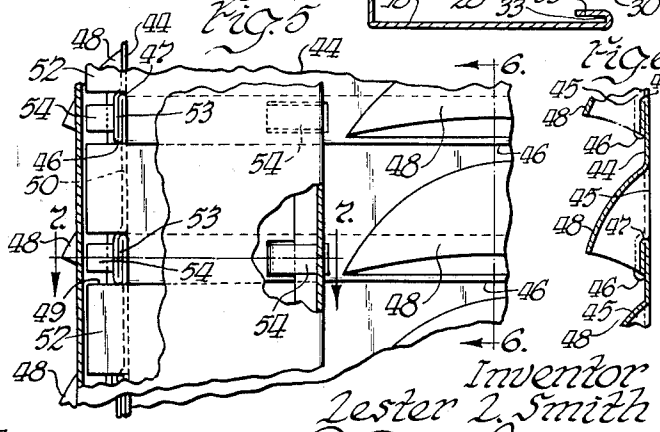
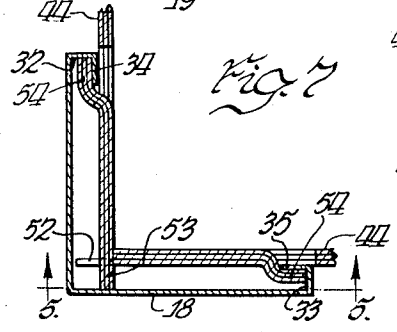


Fig. 6

Fig. 7



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VENTILATOR STRUCTURE

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6 Claims. (Cl. 98—42)

This invention relates to ventilator structures, and more particularly to the structure of cupola type ventilators.

One of the general objects of this invention is to provide a ventilator of the cupola type composed of parts adapted to shipment and storage while disassembled, and some of which parts are subject to interchange with others for adapting the ventilator to use on different types of roofs.

More specifically, my invention comprehends the provision of a cupola type ventilator embodying certain basic parts useable in any adaptation of the ventilator, and additional parts which are subject to selection for adapting the ventilator to either pitch or flat roofs, and which additional parts for use on pitch roofs are constructed and arranged for ready modification at the time of installation and assembly to adapt the structure to the particular pitch of the roof upon which it is installed.

As another object, this invention comprehends the provision of a prefabricated sheet metal cupola type ventilator having wide versatility in its adaptations and uses, and which can be assembled at the time and place of installation without particular skill or the necessity of any complicated sheet metal work.

This invention further has within its purview the provision of a cupola type ventilator which not only provides good all-weather protection, but which also affords ventilating opening areas which are comparable or equivalent to the area of the roof opening over which the ventilator is installed.

It is another object of my invention to provide a prefabricated cupola type ventilator which is suited to mounting directly on a roof or a roof jack.

Within the purview of my invention, I have provided a cupola type ventilator embodying prefabricated sheet metal panels adapted to be tightly and securely held together in assembled relationship by parts co-acting to constitute readily assembled slip joints.

My invention further affords a cupola type ventilator constituting a readily erected assembly of parts which are all adapted to quantity production at relatively low cost.

As another feature, the cupola type ventilator of this invention is adapted to weather-tight installation without the necessity of special flashing.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the single sheet of drawings:

Fig. 1 is a front elevational view of a preferred embodiment of my cupola type ventilator wherein portions are cut away to indicate details of the structure and wherein the ventilator is shown in an adaptation to the pitch roof of a building which is indicated fragmentarily;

Fig. 2 is a fragmentary front elevational view showing the adaptation of my cupola type ventilator to a flat roof;

Fig. 3 is a fragmentary top sectional view of a portion

of my preferred ventilator structure wherein the section is taken substantially on a line 3—3 of Fig. 1 and in the direction of the arrows, and wherein an enlarged scale is utilized to illustrate details of the structure;

Fig. 4 is a view similar to Fig. 3, but wherein the parts of my ventilator structure are indicated in disassembled and exploded relationship;

Fig. 5 is a fragmentary front elevational view of a modified structure adapted to use in my cupola type ventilator and has portions of the structure broken away along a line 5—5 of Fig. 7 to indicate certain details;

Fig. 6 is a fragmentary side sectional view taken substantially on a line 6—6 of Fig. 5 and in the direction indicated by arrows; and

Fig. 7 is a fragmentary top sectional view of a portion of the structure shown in Fig. 5 and wherein the section is taken substantially on a line 7—7 of Fig. 5 and in the direction of the accompanying arrows.

In the accompanying drawings, I have shown exemplary forms, structural details, and adaptations of my invention for illustrative purposes. Considered generally, my cupola type ventilator 10 is built without the necessity of a basic supporting frame structure, but embodies louvered side panels 12, 13, 14 and 15 of generally rectangular shape and mounted in end-to-end relationship and secured together to define a polygonal shape which, in the present instance, comprises a rectangle. This polygonal or rectangular wall structure constitutes the base of the ventilator and is adapted to be mounted over an opening in the roof of a building or the like, which opening is of the same basic shape as the base structure and only slightly smaller than that structure.

As depicted in Figs. 1 and 2, and with only minor modifications, my cupola type ventilator is adapted to mounting on various types of roofs, such as a pitch roof 16 and flat roof 17 which are illustrated. In my disclosed structure the side panels 12, 13, 14 and 15 are removably secured together by corner strips, such as 18, of angular sectional shape, which strips engage and interlock with parts on the side panels. By preference, the side panels have flanges such as 19 along their bottom margins which overlap the roof in the installation of the ventilator and serve as flashing strips. Then a top or cover 20 is secured to the top margins of the side panels and overlaps those side panels to serve as a roof for the ventilator.

In the ventilator structure depicted in Figs. 1, 3 and 4, each of the louvered panels constitutes two metal sheets 22 and 23 having louvers 24 and 25 integrally formed therein, which louvers are of substantially the same size and spacing in the two sheets, so that with the sheets secured together in inverted relationship and with their louvers aligned, as shown in Fig. 1, the louvers overlap and have ventilating space therebetween. With the outer louvers of the structure extending downwardly, and the inner louvers extending upwardly, as shown, their overlapping relationship affords weather-proof protection at the ventilating openings.

In order to adapt my cupola type ventilator to use on a pitch roof, as depicted in Fig. 1, I provide opposed pairs of panels 12 and 13 in which the louvered openings extend practically from the top to the bottom of each panel. These panels are adapted to use on opposite sides of the ventilator. At the ends of the ventilator, the panels 14 and 15 have louvers only extending across the top portions of the panels. This leaves a plane area 26 below the louvers which can be cut at the time of the installation and erection of the ventilator to fit the pitch of the roof upon which the ventilator is to be installed. On the other hand, when the ventilator is to be installed on a flat roof, as depicted in Fig. 2, all of the louvered panels may be alike and of the type indicated at 12 and 13 in

Fig. 1. It may be readily appreciated that by making the louvered panels in standardized sizes and in the types illustrated, combinations may be selected to adapt an assembled ventilator to different types of roofs and to installations on roofs of various pitches.

For the purpose of minimizing storage space as well as for facilitating the installation of the cupola type ventilator, the louvered panels are normally separated, thereby providing for storage in stacks and selection of the required types for a particular installation. The covers or tops **20** are, of course, suited to the standard sizes of louvered panels and are separately stored therewith to be secured in place at the time of the installation and erection of the ventilator.

For further facilitating the erection and installation of my cupola type ventilator, I provide a readily applied and removable securing element for holding the louvered panels together at their corners and for effectively and tightly sealing those corners. As shown in Figs. 3 and 4, sheet metal strips **27** and **28** are secured to the end margins of the louvered panels, as by spot-welding at positions spaced from the ends of the louvered panels. Along the margins of the strips **27** and **28** which are remote from the ends of the louvered panels, those strips are reversely bent to provide end portions **29** and **30** in the form of tongues or lugs which are set out from the outer surfaces of the louvered panels, but which are substantially parallel to the panel surfaces.

The corner strips **18** are return bent along their outer longitudinal margins to provide channels **32** and **33**, as well as flanges **34** and **35**, which flanges extend along and in spaced relationship to the inner margins of the corner strips. The tongues or lugs **29** and **30** on the louvered panels and the channels **32** and **33**, as well as the flanges **34** and **35**, are so related in position and size that when the louvered panels are in abutting relationship, as shown in Fig. 3, the tongues, flanges and channels interengage to form a slip joint, whereby the louvered panels are secured together at their corners by slipping the corner strips **18** over the strips **27** and **28** to effect the engagement of the tongues, channels and flanges.

Additionally to aid in the assembly of the cupola type ventilator depicted in Figs. 1, 3 and 4, and for providing added strength to the assembled structure, the strip **28** which is secured to one louvered panel of a mating pair has a flange **36** thereon which is bent angularly over the ends of the panel sheets and projects in angular relationship from those sheets. Also, an end portion **37** of the strip **27** on the other of the mating panels is sprung away from the panel sheets to receive the flange **36** between that strip and the adjacent margin of the panel sheet as shown in Fig. 3.

In the installation of the disclosed ventilator, and after the selection and adaptation of the louvered panels for covering an appropriate opening in a roof, the louvered panels are secured together by sliding the corner strips into place and the bottom flanges **19** on the louvered panels are secured to the roof. The base structure thus erected is ready to receive the cover **20**. In the disclosed structure, the cover **20** embodies substantially Z-shaped supporting strips **38** along each side, which supporting strips have flanges **39** thereon through which fastening means, such as screws **40**, extend into the top margins of the louvered panels to support the cover and hold it in place. The cover illustrated is in the form of a pyramid made of sheet metal and suitably welded or soldered into the required shape and of a size such that it overlaps and extends beyond the base structure. The sheet metal of the disclosed cover has outer flanges **42** thereon which are secured, as by welding, to flanges **43** on the Z-shaped supporting strips **38**.

In the modified form of my ventilator structure which is illustrated in Figs. 5, 6 and 7, louvered panels **44** are made integrally of a single metal sheet wherein the panels are stiffened and weather-proofing is provided along the

lower portions of louver openings **45** by reverse folds **46** and **47** at spaced positions in the louver sheet affording integral stiffening ribs extending in parallel relationship to each louver **48** at the lower portion of each louver opening. These stiffening ribs overlap the louvers, thereby to afford protection against driving rain, snow and the like.

In order to adapt these louvered panels to use in my disclosed cupola type ventilator structure, and in a manner quite similar to that described with respect to the previously disclosed form, the ends of each pair of adjacent louvered panels **44** have notches **49** and **50** therein, which notches, in each of the panels, are in spaced relationship along the panel end and which are in positions such that they are alternated on the two adjacent louvered panels when the panels are generally aligned with one another. Those notches at the ends of the panels provide tongues **52** and **53** on the two panels which extend in the general planes of the respective panels and are spaced to interengage to hold the adjacent louvered panels in aligned relationship to one another. In the disclosed structure, the notches **50** in one louvered panel are between the adjacent folded portions of the panel and extend from one folded portion to the next, so that the triple-thickness portions project at the end. The notches in the other louvered panels are aligned with the triple-thickness portions of the panel and extend across those triple-thickness portions, so that the intervening single-thickness portions project.

For holding the corner strips and for interengagement with those corner strips to secure the adjacent louvered panels together, lugs or tongues **54** are punched from the triple-thickness portions of the louvered panels **44** and are offset outwardly from the outer panel surfaces in opposed relationship to the adjacent or near ends of each louvered panel. The lugs or tongues **54** on each louvered panel are also aligned on that louvered panel, so as to provide a row for receiving and engaging with the channels and flanges on the corner strip. Thus, as in the previously described form of the invention, a slip joint is provided, whereby the adjacent louvered panels are secured together by sliding the corner strips into place in a direction longitudinal to those strips.

From the foregoing description and the references to the accompanying drawings, it may be readily understood that I have provided a cupola type ventilator suited to rapid assembly and installation, as well as for initial storage with the parts disassembled, and which structure embodies parts such that by selection of those parts and a minimum of readily accomplished alterations, the structure is adapted to installation on various types of buildings and roofs.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

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

1. A cupola type ventilator comprising, in combination, a polygonal base structure embodying a plurality of louvered sheet metal panels which constitute side walls of the base structure, and angularly flanged corner strips for securing the panels together at the corners of the base structure, said panels and corner strips having means thereon serving as inter-engaging slip joints adapted to assembly by sliding the corners strips along the adjacent panels longitudinally of the corner strips, said means on the panels and corner strips comprising return bent flanges on the corner strips which extend along opposite sides thereof, and lugs along the end margins of the louvered panels which project away from the adjacent ends of each panel and which are offset outwardly from the outer sur-

faces of the panels for inter-engaging with the flanges on the corner strips, said panels also having parts thereon for releasably holding adjacent panel ends in assembled and aligned relationship while the corner strips are assembled thereon, a cover for the rectangular base structure, and means for securing the cover to the louvered panels of the base structure.

2. A cupola type ventilator as defined in claim 1, and wherein said parts for releasably holding adjacent panel ends in assembled and aligned relationship comprise an angularly projecting flange on one end of each louvered panel, and a metal strip extending along the end margin of the adjacent louvered panel and secured thereto at a distance from the end so as to provide an end margin of double thickness metal thereon, and said angularly projecting flange of each louvered panel being inserted between the said metal strip and the surface of each adjacent louvered panel in the assembly of the panels.

3. A cupola type ventilator as defined in claim 1, and wherein the louvered sheet metal panels of the base structure are arranged in opposed pairs, the louvers in one pair of panels covering a major portion of the area of each panel of the pair from the top of each panel to the bottom thereof, and the louvers of the other pair of panels being located only near the top of each panel so as to provide a plane lower area adapted to be cut to fit a roof of predetermined pitch.

4. A cupola type ventilator as defined in claim 1, and wherein the louvered panels are folded at spaced positions with two reverse folds at each of said positions to provide laterally extending strips of triple thickness metal at said positions, and said lugs being integrally formed in said panels where the metal is of triple thickness.

5. A cupola type ventilator as defined in claim 1, and wherein the louvered panels are folded at spaced positions with two reverse folds at each of said positions to provide laterally extending strips of triple thickness metal at said positions, and adjacent ends of said louvered panels of the base structure being notched at staggered positions such that projecting end portions of one louvered panel extend through aligned notches in the end of the adjacent louvered panel to provide said parts for releasably holding adjacent panel ends in aligned relationship.

6. A cupola type ventilator as defined in claim 5, and wherein the notches in one of the louvered panels are between the strips of triple thickness metal and the notches in the adjacent louvered panel are at the strips of triple thickness metal.

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