April 1, 1958 L. L. SMITH ET AL 2,828,711

METHOD OF MAKING LOUVER TYPE VENTILATORS

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FIG. 1

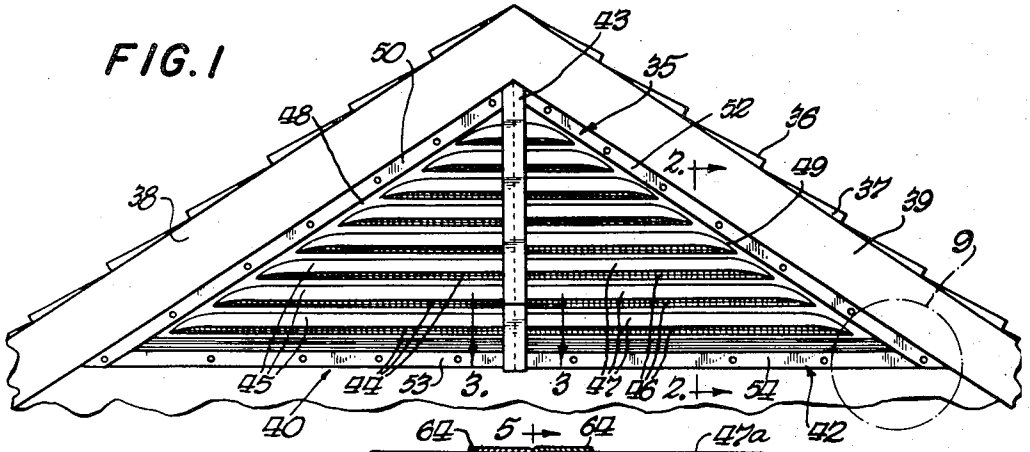


FIG. 3

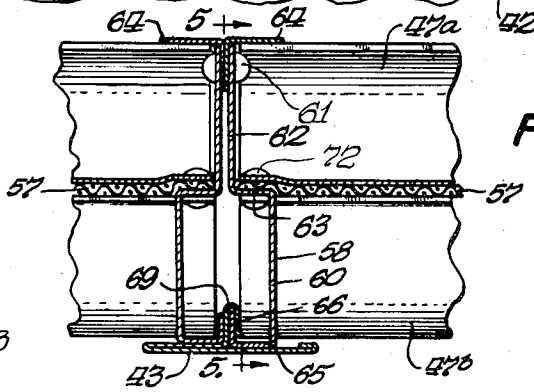


FIG. 2

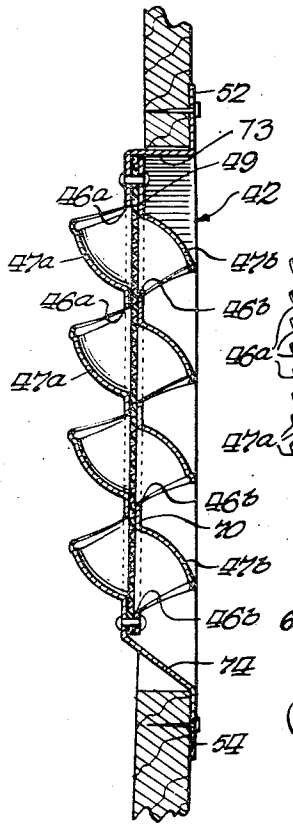
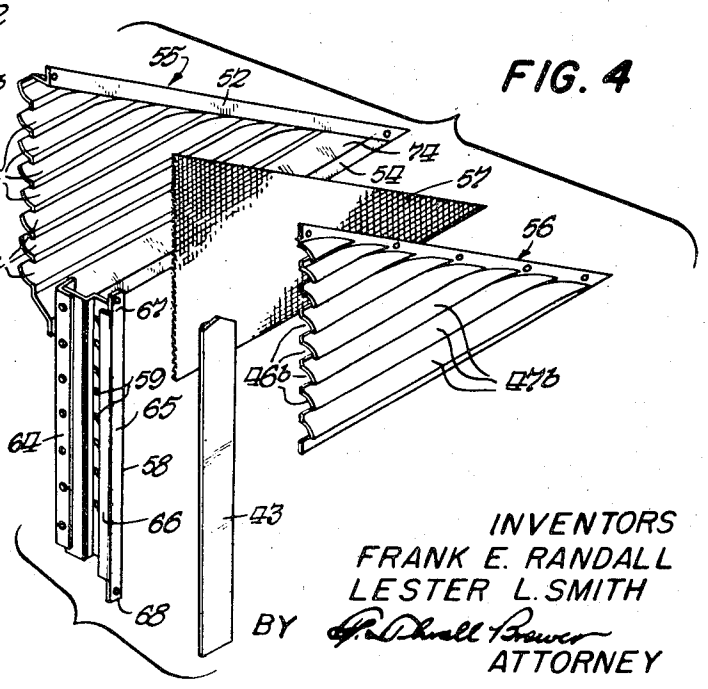


FIG. 4



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FIG. 5

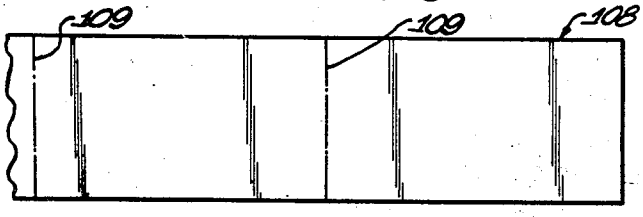


FIG. 6

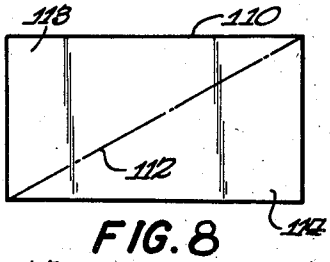


FIG. 7

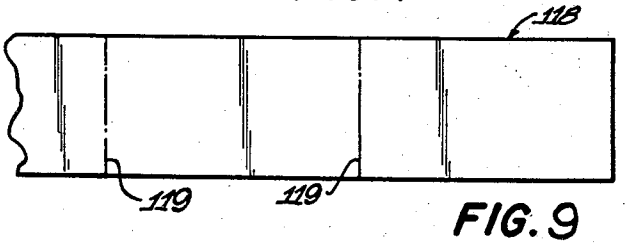


FIG. 8

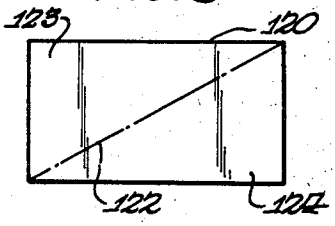


FIG. 9

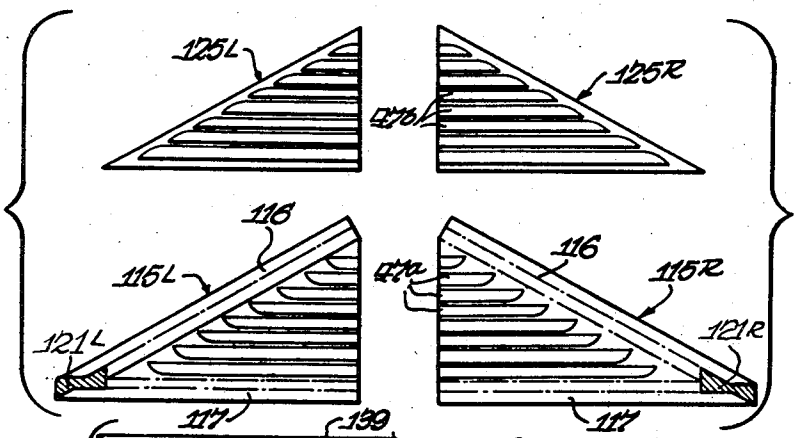
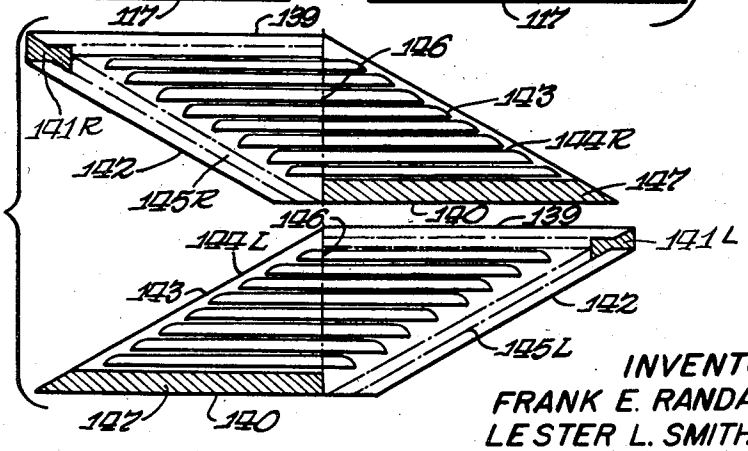


FIG. 11



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FIG. 12

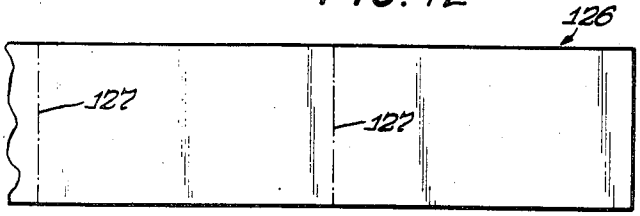


FIG. 13

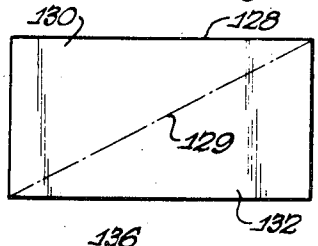


FIG. 10

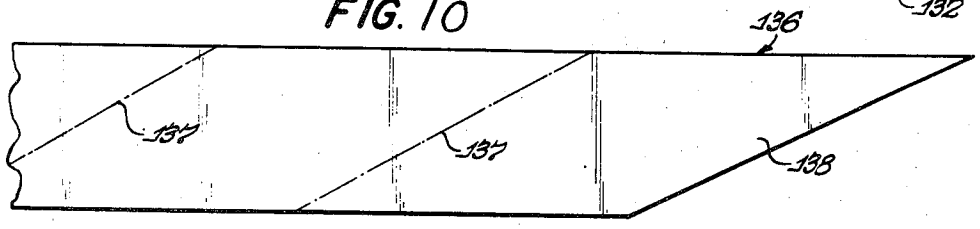


FIG. 14

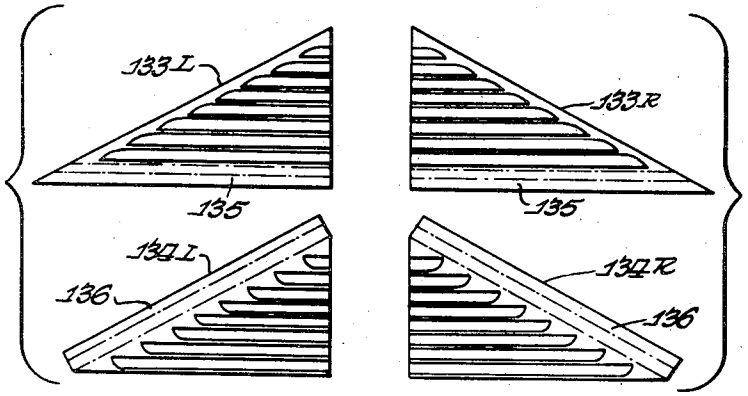
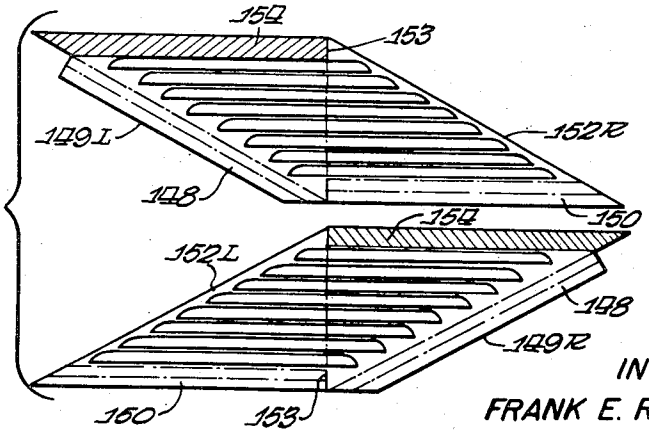


FIG. 15



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METHOD OF MAKING LOUVER TYPE VENTILATORS

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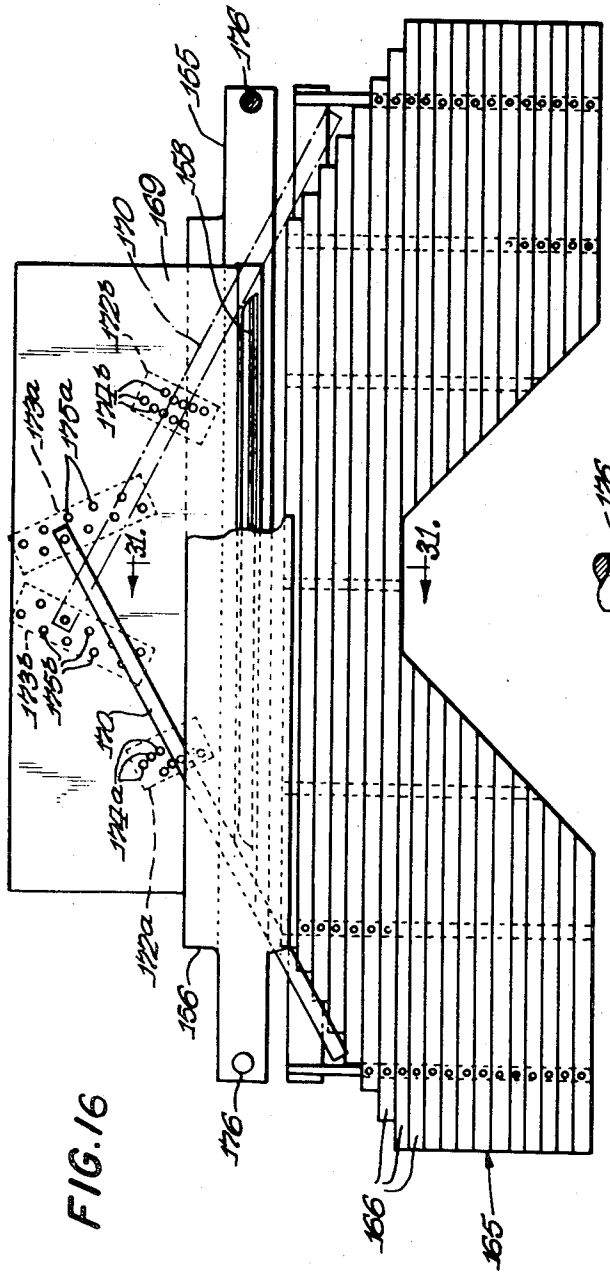


FIG. 16

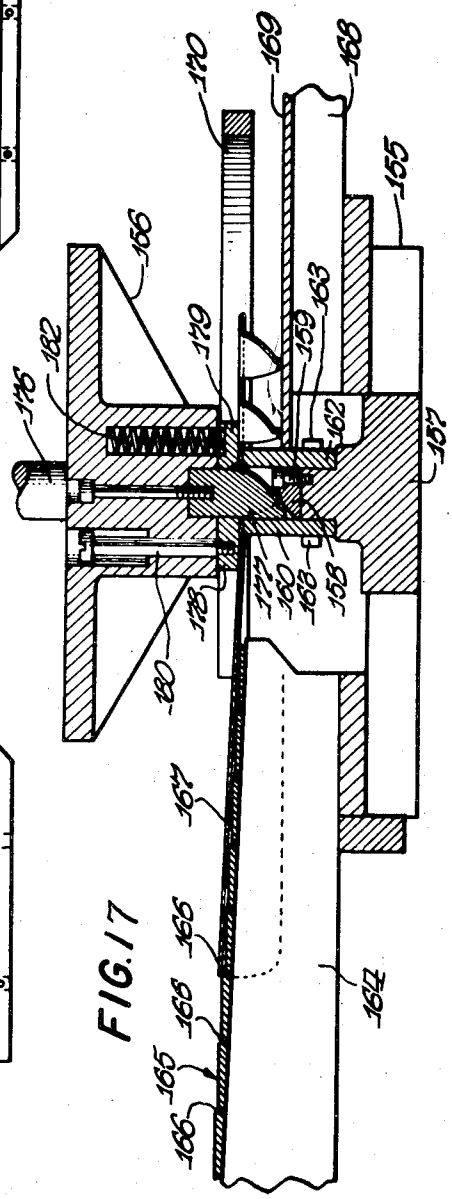


FIG. 17

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United States Patent Office 2,828,711 Patented Apr. 1, 1958

2,828,711

METHOD OF MAKING LOUVER TYPE VENTILATORS

Lester L. Smith, Peoria, and Frank E. Randall, Peoria Heights, Ill.; said Randall assignor to said Smith

Original application May 17, 1954, Serial No. 430,272. Divided and this application April 13, 1955, Serial No. 501,047

6 Claims. (Cl. 113—116)

This invention relates to a method of making louver type ventilators, and more particularly to a method of making such ventilators from sheet material. This application is a division of our copending application Serial No. 430,272, filed May 17, 1954 and entitled Louver Type Ventilator and Method of Making Same.

One of the objects of our invention is to provide a method of producing sectional louver type ventilators in which stamped louver panels are utilized.

As another object our invention comprehends the provision of a method of making louver type ventilators of various sizes and with different numbers of louvers, and which method permits the use of the same stamping die for producing the different sizes and numbers of louvers.

Our invention further contemplates the provision of a method of making triangular louver type ventilators having various pitch angles, and by which method the same stamping die can be used for each of the various pitch angles.

It is another object of our invention to provide a method of making double panel triangular or sectional louver type ventilators with louvers projecting from both panels and wherein a screen is mounted between the panels to cover the louver openings.

Another object of this invention is to provide a method of making louver type ventilators which not only contributes to low tool and labor costs in production, but which is also very economical of material and the kinds and sizes of material required for producing the parts.

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 seven sheets of drawings:

Fig. 1 is a front elevational view showing the application of a louver type ventilator incorporating a preferred embodiment of this invention as it is applied to the gable of a building, such as a house;

Fig. 2 is an end sectional view drawn to a larger scale than Fig. 1 and taken substantially on a line 2—2 of Fig. 1 and in the direction indicated by arrows;

Fig. 3 is a fragmentary top sectional view drawn to a larger scale than Fig. 1 and wherein the section is taken substantially on a line 3—3 of Fig. 1 and viewed as indicated by arrows;

Fig. 4 is an exploded view in perspective showing the principal parts of one section of the louver type ventilator illustrated in Fig. 1;

Fig. 5 is a fragmentary plan view illustrating one step in a preferred manner of cutting sheet metal from strip or roll stock for producing blanks for one of the panel parts adapted to use in one method of fabricating louver type ventilators in accordance with our present invention;

Fig. 6 is a top plan view illustrating a second step in cutting the stock for preparing the blanks utilized for the production of the said one panel part;

Fig. 7 is a fragmentary plan view illustrating one step

of cutting blanks from strip or roll stock for use in fabricating a second type of blank utilized in our method of producing the disclosed louver structure;

Fig. 8 is a top plan view indicating a second cut utilized in preparing the blanks for the said second panel part;

Fig. 9 depicts fabricated panel parts made from the blanks produced as indicated in Figs. 6 and 8;

Fig. 10 is a fragmentary plan view illustrating another manner of cutting sheet metal blanks from strip or roll stock for the production of ventilator section panels by a modified method and for use in the production of ventilator sections in accordance with our invention;

Fig. 11 depicts one manner of cutting partially fabricated ventilator panels which are produced from stock cut in the manner illustrated in Fig. 10;

Figs. 12 and 13 are views similar to those of Figs. 5 and 6, but which illustrate the manner of cutting blanks from sheet or strip stock, so that all of the panel sections are made from blanks of the same width;

Fig. 14 illustrates partially fabricated panels made from blanks of the type illustrated in Fig. 13, which partially fabricated panels vary somewhat in structure from those illustrated in Fig. 9;

Fig. 15 illustrates the manner of cutting partially fabricated panels from pieces produced from blanks of the type shown in Fig. 10, which partially fabricated panels, although differently produced, are comparable in structure to those depicted in Fig. 14;

Fig. 16 is a somewhat diagrammatic top plan view of a piercing and forming die and associated parts utilized for producing louver panels of the type disclosed herein by successively piercing and forming those panels with a single die, the structure illustrated being adapted to variations for changing the pitch angle of ventilator sections produced thereby; and

Fig. 17 is a fragmentary end sectional view taken substantially on a line 31—31 of Fig. 16 and indicating the manner of piercing and forming prepared blanks in successive steps with the same die to produce sectional ventilators of the type herein disclosed by our preferred method.

Considered generally, the louver type ventilators herein disclosed are fabricated mainly from sheet metal parts, and are made in sections adapted to ready assembly at the time of their application to a building structure, thereby to afford ventilators of large area without introducing problems into the fabrication, shipping and installation as a result of the unwieldy size of a comparable unitary structure. In addition, and as will become apparent, the fabrication of the ventilators in section from sheet stock not only limits the required number of parts to a very small minimum, but also affords advantages resulting from an ability to produce ventilators of varying sizes and shapes with a very nominal tool cost and without the necessity of having different dies for each size and shape.

Having reference to the preferred embodiment of our louver structure which is illustrated in detail in Figs. 1 to 4 inclusive of the drawings, and wherein that structure affords an illustrative embodiment of our invention, a louver type ventilator 35 is shown assembled in Fig. 1 and applied to the gable at one end of a building, such as a house 36, having a roof 37 and trim strips 38 and 39 which overlap marginal portions of the ventilator. This louver type ventilator 35 embodies left- and right-hand sections 40 and 42 respectively, as viewed, which sections are separately fabricated and shipped to the point of application to the building structure. The line of division between the assembled sections 40 and 42 is, in the finished and assembled ventilator structure, covered by trim strip 43.

The ventilator section **40** is in the form of a panel of right-triangular shape having therein a series of elongated slots **44** for the passage of air through the ventilator, which slots are substantially parallel to one another and to the base of the panel, as well as overlapped by louvers **45**, the louvers of the disclosed structure being integrally made from the panel stock by a piercing and forming operation. Likewise, the panel **42** has therein a series of substantially parallel slots **46** which are spaced for alignment with the slots **44** in the section **40** when the ventilator sections **40** and **42** are abutted together in opposed relationship, as shown. Each of the slots **46** in the ventilator section **42** is overlapped by an integrally formed louver **47**. Side margins **48** and **49** are provided on each of the ventilator sections **40** and **42** by spacing the ends of the slots and their respective louvers inwardly by substantially equal amounts from the adjacent edges of the panels. In the structure illustrated in Figs. 1 to 4 inclusive, side flanges **50** and **52** and bottom flanges **53** and **54** are provided on the ventilator sections **40** and **42** respectively and the mid-portion of each ventilator section is set back from those flanges to provide for substantially flush mounting of the ventilator structure with the general outer plane of the building wall to which it is secured.

Although laterally reversed, the structure of each of the ventilator sections **40** and **42** is substantially the same, so that a description of the structural details of one section will suffice for both. In our disclosed ventilator structure, and as depicted in Figs. 2 and 4, each ventilator section, such as **42**, incorporates inner and outer panel parts **55** and **56**, each of right-triangular shape and made so that the elongated slots **46***a* in the inner panel part register with the slots **46***b* in the outer panel part when the two panels are assembled and secured together in face-to-face relationship for use. The louvers **47***b* on the outer panel part, however, extend downwardly over the slots while the louvers **47***a* on the inner panel part extend upwardly over the adjacent slots. This arrangement, as shown in Fig. 2, affords double weather protection for keeping out driving rain, snow and the like without materially restricting the areas of the ventilating openings. Also, in our disclosed structure, a screen **57** is interposed between the inner and outer panel parts for protection from the free passage of insects and the like. As may be observed by references to Fig. 4, the inner and outer panel parts each constitute an integrally fabricated structure which, although the slots extend to one end and open outwardly at that end, is held together by the marginal portion at the opposite ends of the slots. In order to afford rigidity to each ventilator section and to provide support for the free ends of the louvers in the assembled ventilator sections, we provide a supporting strip **58** having slots **59** therein through which the ends of the louvers of at least the outer panel parts extend. It may be observed that the supporting strip **58**, in the form shown, has parallel portions **60** and **62** integrally connected through a web **63** and offset from one another in a direction lateral to the planes of those portions. The portion **60**, in the assembly of the louver section, is aligned with the louvers **47***b* of the outer panel and has the slots **59** therein through which the ends of those louvers extend, the slots **59** being shaped to conform to the end contours of the louvers, so that they fit therein. The ends of the louvers **47***a* of the inner panel are in closely spaced relationship to the portion **62** of the supporting strip and are supported relative thereto along the rear surfaces of the end margins of those louvers by an angle strip **64** secured by fastening means, such as rivets **61**, to the rear margin of the portion **62** and extending along the length of that portion with one flange of the angle projecting behind the louvers **47***a* in the assembly of the ventilator section. At the front of the supporting strip **58**, it has integral flange portions **65** and **66** formed thereon to provide a substantially U-shaped front sectional portion along the portion **60** of the supporting strip. The flange **65** has projecting ends **67** and **68** to which marginal portions of the outer louver panel are secured and carries the flange **66** along one side which, as shown in Fig. 3, serves as an anchor for carrying the trim strip **43** which has a hook-shaped portion **69** on its rear surface for engaging the flange **66**.

Each of the louvers **47***a* and **47***b* has a relatively flat strip portion **70** along its inner margin which is secured by fastening means such as a rivet **72** to the web **63** of the supporting strip. In the structure shown in Figs. 1 to 4 inclusive, the relatively flat strip portions **70** on the louvers of the inner and outer panels are aligned and disposed on opposite sides of the web **63**, so that the rivets or fastening means **72** serve to anchor the ends of both sets of louvers to the supporting strip. In order to provide for the aforementioned flush mounting of the assembled louver sections relative to a wall or supporting structure, a flange **73** extends forwardly from the inner louver panel and adjoins the marginal flange **52**, this flange **73** extending along practically the full length of the outer edge of the louver panel. At the bottom of the inner louver panel, a skirt **74** extends outwardly from the inner louver panel and adjoins the flange **54**, this skirt being disposed at an obtuse angle with respect to the general plane of the louver panel and the plane of the flange **54**, in order to provide for drainage. While the flanges and skirt of the presently considered structure are both on the inner louver panel, it is understood that they might both be on the outer louver panel or one might be on one louver panel and one on the other.

In mounting two of the louver sections of the type thus far described to provide a composite ventilator structure of the type illustrated in Fig. 1, adjacent ends of the two opposed sections are abutted together, as shown in Fig. 3. The angle strips at the rear of the supporting strip **58** engage one another, and the flanges **66** at the front of the supporting strip are separated only by the hook portion **69** of the trim strip **43**, which hook portion is gripped therebetween to secure the trim strip in place. It may be observed by reference to Fig. 1 that the slots and louvers of the two ventilator sections are aligned to give the appearance of continuity across the structure, and that the trim strip **43** covers the joint between the ventilator sections to afford a finished appearance to the assembled sections.

Figs. 5 to 15 inclusive are concerned primarily with the method and steps utilized in the fabrication of panel parts for the ventilator sections of the type herein described. Considered generally, Figs. 5 to 9 inclusive illustrate the steps of cutting blanks from strip or roll stock of two different widths to produce right- and left-hand panel parts wherein the mounting flanges and skirt are on the inner panel part, as depicted structurally in Figs. 1 to 4 inclusive. Figs. 10 and 11 illustrate a different manner of cutting and utilizing blanks of strip or roll stock to produce louver panel parts of the same type as those illustrated in Fig. 9. Figs. 12, 13 and 14 show a method of cutting blanks and fabricating right- and left-hand panel parts wherein the mounting flanges and the skirt are divided between the panel parts. Figs. 10 and 15 illustrate a method of producing panel parts of a type shown in Fig. 14 by methods similar to that illustrated in Figs. 10 and 11.

As depicted in Fig. 5, sheet metal stock **108** which may be from a roll or in strip form is cut laterally along lines such as **109** to provide rectangular pieces **110** of a size such that when cut diagonally along a line **112**, two blanks **113** and **114** of right-triangular shape are produced therefrom, which blanks are of a size such that by further cutting piercing and forming operations, partially completed panel parts **115R** and **115L** are produced from each of the pieces **110**. The partially completed panel parts **115R** and **115L** of the type shown in Fig. 9, when completed, constitute panel parts of the type shown at **55** in Fig. 4. Since the panel parts **115R** and **115L**

include marginal portions **116** and **117** along the base and hypotenuse of the right-triangular panel parts, which marginal portions are bent to provide mounting flanges and flashing, the stock used for those parts is somewhat wider than that used for producing the outer panel parts and waste pieces **121R** and **121L** of irregular contour are cut from the acute angular corner portions to establish a pattern in the blanks which is suited to the folding of the flanges and flashing. As indicated in Figs. 7 and 8, sheet metal stock **118** which is somewhat narrower than the stock **108** is cut laterally along lines **119** to produce rectangular pieces **120**, which latter pieces are cut diagonally along a line **122** to provide blanks **123** and **124** for the production of panel parts **125L** and **125R**, as shown in Fig. 9.

One of the features of our illustrated method of producing louvered panel parts is that it tends to minimize tool cost by (*a*) permitting the piercing and forming operations for the integral formation of louver panels to be accomplished in successive steps with a die which pierces and forms the sheet metal blank stock individually and sequentially to produce a series of louvers on each blank, and (*b*) permitting the guides utilized with the die in the piercing and forming operations to be adjusted so that the panel parts having different numbers of louvers or panel parts adapted to conform to different roof pitch angles can be produced with the same piercing and forming die.

When right-triangular blanks such as **113**, **114**, **123** and **124** are to have the louvers integrally formed therein for the production of sectional ventilators of the type herein disclosed, guides are utilized with the piercing and forming die which not only effect uniform spacing of a series of louvers in the blank, but which also gauge the longitudinal portion of the piercing and forming die which is utilized for the production of each individual louver of the series. That is, since the louvers of our disclosed panel parts are parallel to the base edge of the triangular blank and extend to the edge which is in right-triangular relationship to the base, the successive portions of the die which are utilized for the formation of each succeeding louver of the series increase in length from the top of the panel part toward the base edge. Preferably, the ends of the individual louvers thus formed are spaced with substantial uniformity from the edge of the blank which comprises the hypotenuse of the right triangle. By utilizing uniform spacing of the louvers and opposite ends of the same die for producing the louvers in the left- and right-hand panel parts of each ventilator section, a continuity of the louver lines is provided for when the ventilator sections are abutted together in pairs. It may be readily understood, of course, that different settings of the guides are required for producing the panel parts of the left- and right-hand portions, as well as for producing the inner and outer panel parts.

As shown in Figs. 12, 13 and 14, sheet metal stock **126** from a roll or strip of preselected width is cut along lines **127** to produce rectangular pieces, such as **128**. The pieces **128** are cut diagonally along a line **129** to produce right-triangular blanks such as **130** and **132**, from which panel parts **133L**, **133R**, **134L** and **134R** may all be produced with a very insignificant amount of material waste. It may be observed by reference to Fig. 14 that uniformity of the width of the stock and blanks for the panel parts **133L**, **133R**, **134L** and **134R** is accomplished by providing a marginal portion **135** at the bottom of the parts **133L** and **133R** which, when bent, provides the flashing and a base mounting flange. In the panel parts **134L** and **134R**, a marginal portion **136** is provided along the hypotenuse of the right-triangular pieces, which portion, when bent, serves to provide an upper or side mounting flange when the panel parts are assembled into completed ventilator sections and secured together. The formation of the integral louvers in the panel parts **133L**, **133R**, **134L** and **134R** is accomplished in a manner similar to that described with respect to the panel parts illustrated in Fig. 9.

Figs. 10, 11 and 15 illustrate a modified method of producing ventilator panel parts of the same general and ultimate types as those heretofore described, this modified method utilizing a different shape of blank and a somewhat different sequence of steps, but retaining the same advantages in respect to the limitation of tool costs for producing ventilators of different sizes and having different pitch angles, as shown in Fig. 10, sheet metal stock **136** of a predetermined width is cut along lines **137** which extend diagonally of the strip or roll stock, so that the resultant pieces **138** are in the shape of a parallelogram. Each parallelogram thus produced has parallel base edges **139** and **140**, as well as parallel end edges **142** and **143**, each of which end edges form an acute angle with the adjacent base edge.

By selection of a predetermined length for the parallelogram from one end edge to the other in a direction parallel to the base edge and by utilizing a piercing and forming die having a length which is somewhat less than the aforementioned length of the blank pieces, so as to provide marginal spaces at the ends of the panel parts, the piercing and forming operations for producing the louvers of two panel parts may be accomplished with a single die in sequential steps at each operation of the die. In this instance, guides are utilized with the die which maintain parallel relationship of the successively formed louvers with the base edges of the blank, as well as effecting uniform spacing between the successively formed louvers. Also, uniform spacing is maintained between the ends of the louvers and the end edges of the blanks. As shown in Fig. 11, the inversion of two such blanks and the sequential piercing and forming of the successive louvers in uniformly spaced relationship on both blanks while maintaining corresponding spaced relationship between the ends of the formed louvers and the end edges of the blanks, produces in one blank an outer right-hand panel part **144R** and an inner right-hand panel part **145R**, while producing in the other or inverted blank an outer left-hand panel part **144L** and an inner left-hand panel part **145L**.

After the piercing and forming operations which produce the integral louvers for each parallelogram blank, those pieces are severed along lines **146** at the mid-portion of each parallelogram blank and in a direction lateral to the base edges of the blank. This severance segregates the partially formed panel parts and effects the production of two substantially right-angular panel parts from each of the parallelograms. In the structures depicted in Fig. 11, a trimming operation is required to remove a small piece of material **141** and a strip of material **147** from each of the outer panel parts **144R** and **144L**. In this instance, the marginal portions utilized for the formation of the mounting flanges and flashing are incorporated on the inner panel parts **145R** and **145L**. Panel parts thus produced finally result in the same structural shapes and relationships as those produced by the formely described method and which are shown in Fig. 9.

In Fig. 15, the production of panel parts for a modified structural form of ventilator section is illustrated. The blanks utilized are of the parallelogram type produced in the manner depicted in Fig. 10 and the piercing and forming operations for the louvers are carried out in a manner similar to that described with respect to the form shown in Fig. 11. However, in this instance, as in the panel parts illustrated in Fig. 14, a marginal portion **148** on each of the left- and right-hand inner panel parts **149L** and **149R** provides one mounting flange for the ventilator section, while a marginal portion **150** on each of the outer left- and right-hand panel parts **152L** and **152R** provides material for the flashing and base mounting flange. In this instance, the parallelograms are severed along lines **153** and a narrow strip of

material is removed from the base margins of panel parts 149L and 149R. As in the previously described forms, and with particular respect to the form shown in Fig. 14, the panel parts 149L, 149R, 152L and 152R can be secured together in face-to-face relationship to provide left- and right-hand ventilator sections adapted to mounting in coplanar and abutting relationship, as illustrated in the structural drawings, to provide louver type ventilators of relatively large area.

In order further to clarify and explain the piercing and forming operations which have been referred to in connection with our disclosed method, including the modifications of the method, and for the purpose of showing one manner of carrying out the described method steps utilized in the production of panel parts for our sectional louver type ventilators in a manner which tends to minimize the tool costs, we have illustrated in Figs. 16 and 17 a type of die and guide set-up adapted to use in a standard press for carrying out the required operations. As there disclosed, a base 155 is adapted to be mounted on the stationary platform of a standard punch press, and a die supporting block 156 is adapted to be carried for vertical movements by the movable portion of the press. A die support block 157 is mounted in the mid-portion of the base 155 and carries a female die block 158 which is secured thereto by fastening means such as screws 159. Extending longitudinally along opposite sides of the die block 158 are material support ing plates 160 and 162, the former of which serves as a shear block. Both of the supporting plates 160 and 162 are secured to the opposite sides of the die supporting block by fastening means such as screws 163. At one side of the die block 158, a platform 164 carries a notched guide plate 165 having a series of parallel and spaced notches 166 in the upper surface thereof, which notches have surfaces facing toward the die block that are adapted to engage an edge of a blank such as 167 to effect the location of the blank relative to the die block so as to locate that blank during the piercing and forming of successive louvers in the blank. On the opposite side of the die block 158 from the platform 164 is a second platform 168 having a surface 169 which engages and supports the side of the blank in which the louvers have been formed.

For effecting location of the blank in a direction longitudinal of the die block, a guide bar 170 is provided, which guide bar is secured to the base 155 through blocks 172*a* and 173*a*; the blocks 172*a* and 173*a* respectively having series of threaded bores 174*a* and 175*a* which receive screws extending through the guide bar 170 to secure that guide bar in place at a preselected angle relative to the longitudinal axis of the die. The threaded bores in the blocks 172*a* and 173*a* are so positioned that a number of angular positions of the guide bar 170 can be selected for producing louvers with different pitch angles. As depicted in Fig. 16, the guide bar 170 can be mounted on either side of a lateral center line of the die for performing the piercing and forming operations on either left- or right-hand panel blanks, as well as those which are used as the inner and outer panel parts. Blocks 172*b* and 173*b* having series of threaded bores 174*b* and 175*b* therein are utilized to carry the guide bar 170 in the second position.

The die supporting block 156 is carried for vertical linear movement relative to the die block 158 by guide rods 176 at its opposite ends. This die supporting block carries a male die 177 in aligned relationship relative to the die block 158 and the supporting plate 160. On opposite sides of the die 177 and extending longitudinally thereof are gripping plates 178 and 179 which are carried for limited movement relative to the supporting block 156 and the opposite side surfaces of the die 177 by a series of alternated guide screws 180 and compression springs 182, which guide screws guide and limit the linear movements of the gripping plates 178 and 179 and which compression springs bias those gripping plates away from the supporting block 156 and toward the material supporting plates 160 and 162. Thus, in operation, the sheet material of the blank being pierced and formed is gripped between the supporting plates 160 and 162 and the gripping plates 178 and 179 on opposite sides of the die 177 before the piercing and forming operation of the die is commenced and while that piercing and forming operation is in progress.

It may be readily understood that with the die and guide structure shown in Figs. 16 and 17, blanks of either the previously discussed triangular or parallelogram type may be located for the successive piercing and forming of louvers therein by placing the blank on the guide plate 165 with one edge engaged by a notch surface in that plate and with the blank laterally located relative to the die by the guide bar 170. The successive louvers are formed in the blank with their positions determined by the use of successive notches in the guide plate 165 while the other edge of the plate is kept in contact with the guide bar 170. In the production of panel parts from triangular blanks, successively varying end portions of the punching and forming dies are utilized, while in the production of panel parts from the parallelogram type of blanks, the entire length of the piercing and forming dies is utilized at each piercing and forming step.

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

1. The method of making sectional triangular louver type ventilators which comprises the steps of fabricating left and right hand louver type ventilator portions which are each of right-triangular shape and which when abutted together along corresponding edges form a triangle of substantially isosceles shape, said fabricating of each of the ventilator portions including the steps of cutting, punching and forming sheet metal stock to provide elongated slots substantially parallel to a base edge and extending to another edge from positions spaced from a third edge with integral louvers overlying the slots, and securing supporting parts to each of the ventilator portions along the edges to which the slots extend.

2. The method of making sectional triangular louver type ventilators as defined in claim 1, and wherein said sheet metal stock is cut to substantially right-triangular shape, and then punched and formed successively with varying portions of the same punching and forming die to provide the elongated slots.

3. The method of making sectional triangular louver type ventilators as defined in claim 1, and wherein the fabrication of each of said left and right hand ventilator portions includes the steps of producing two similar and opposed front and rear parts from sheet metal stock in the same manner and securing said parts together in face-to-face relationship with their elongated slots in register with one another.

4. The method of making sectional triangular louver type ventilators which comprises the steps of fabricating left and right hand louver type ventilator portions which are each of right-triangular shape and which when abutted together along corresponding edges form a triangle of substantially isosceles shape, said fabricating of each of the ventilator portions including the steps of cutting, punching and forming sheet metal stock to provide elongated slots substantially parallel to a base edge of a piece of stock substantially the shape of a parallelogram and longitudinally located in staggered relationship within the parallelogram with integral louvers overlying the slots, cutting the parallelogram shaped piece laterally of the slots and louvers to separate the parallelogram shaped piece into parts of right-triangular shape having the slots and louvers extending to one edge thereof, and securing a supporting part to each of the triangular parts along the edge thereof to which the slots extend.

5. The method of making triangular sections of louver

type ventilators which are adapted to mounting in coplanar relationship with other sections to provide louver type ventilators of relatively large area, which method comprises the steps of cutting pieces of right-triangular shape from sheet metal stock and successively punching and forming said pieces with varying portions of the same punching and forming die to provide in each piece a series of elongated slots and associated louvers substantially parallel to one edge of the piece, extending to a second edge of the piece and spaced with relative uniformity from a third edge of the piece, and reinforcing the piece along said second edge by providing a part which bridges the ends of the elongated slots.

6. The method of making triangular sections of louver type ventilators which are adapted to mounting in opposed pairs in substantially coplanar relationship to provide louver type ventilators of large area, which method comprises the steps of cutting sheet stock to provide a piece of triangular shape having two adjacent edges in acute angular relationship to one another and a third edge in right angular relationship to one of the two adjacent edges, successively punching and forming said piece with successively varying portions of the same punching and forming die at spaced positions intersecting said third edge and successively offset from one another in a direction lateral to the spacing of the positions to provide in said piece a series of elongated slots and louvers having edges substantially parallel to said one of said two adjacent edges and ends spaced substantially equidistantly from the other of said two adjacent edges, making a second piece in a similar manner but reversed in structure, securing the pieces in face-to-face relationship with the slots in substantial register and louvers projecting from opposite surfaces, and securing a supporting strip along the said third edge of the piece which is opposed to the acute angle between the first mentioned edges and supports the louvers.

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