April 13, 1954 L. L. SMITH 2,675,072

ADJUSTABLE LOUVER TYPE VENTILATOR

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Fig. 1

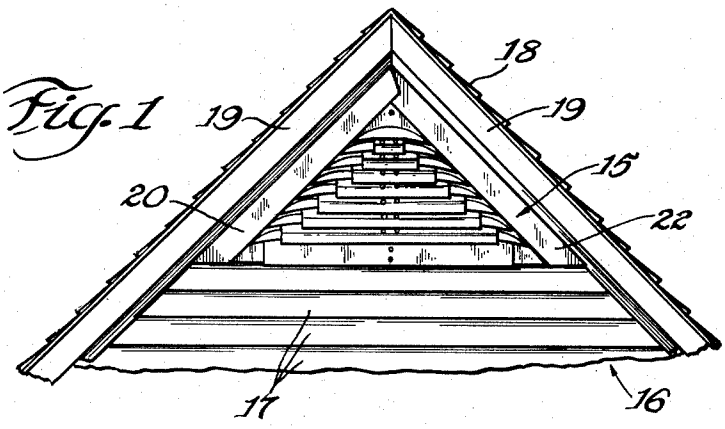


Fig. 2

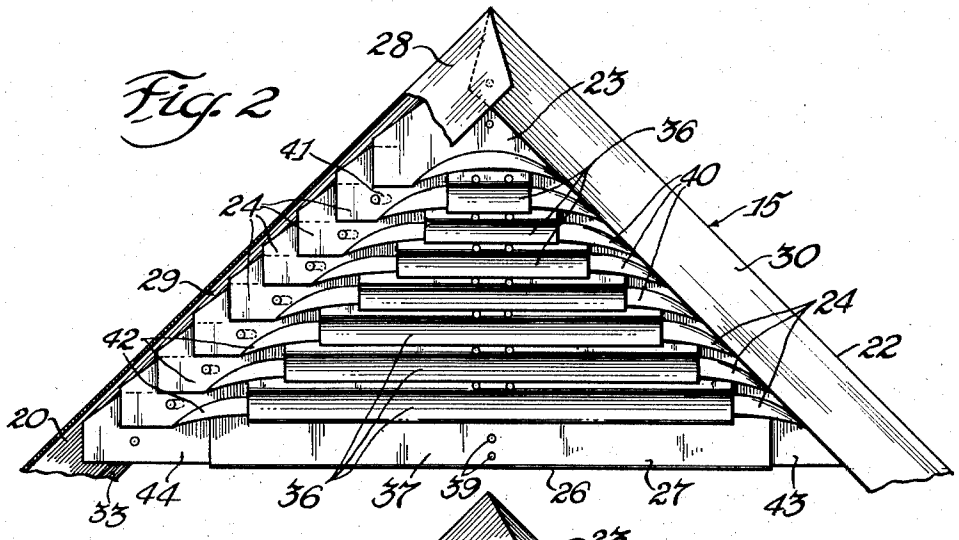
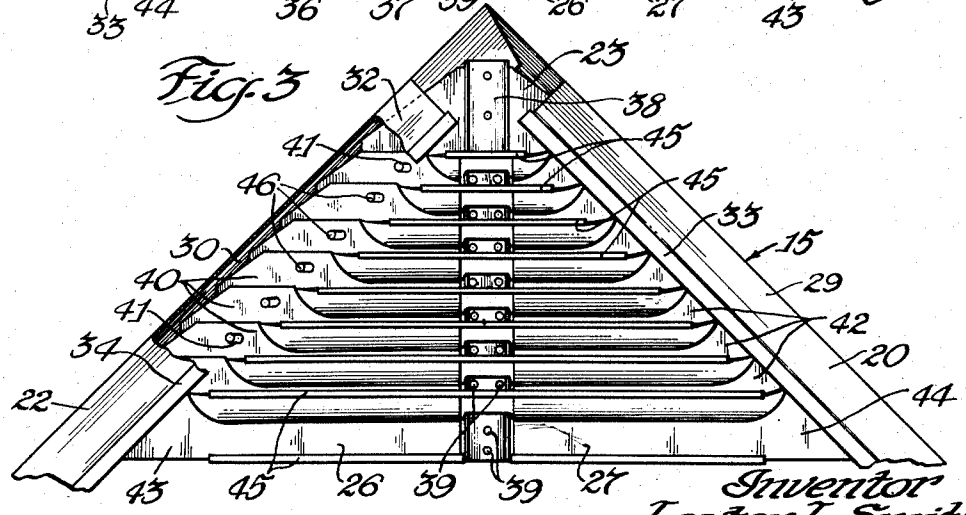


Fig. 3



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Fig. 5

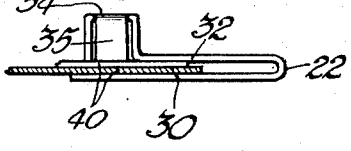


Fig. 4

Fig. 6

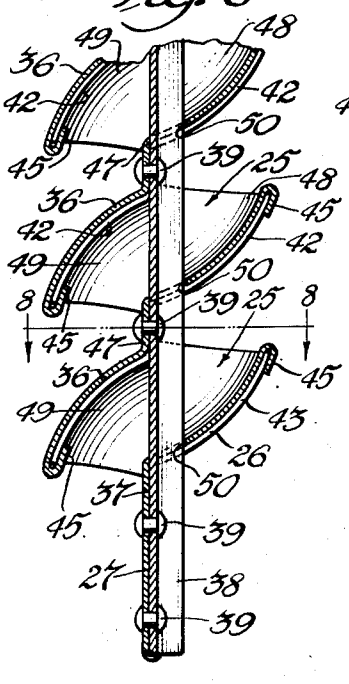


Fig. 7

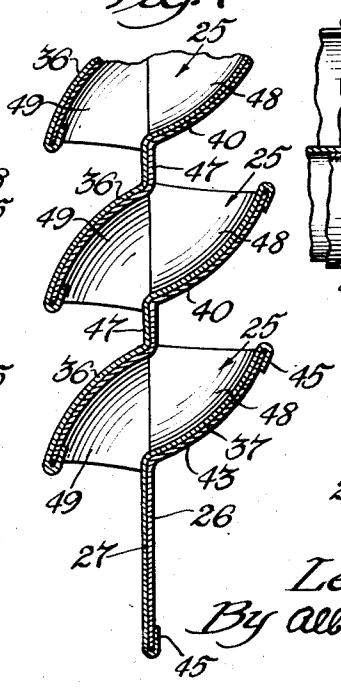


Fig. 8

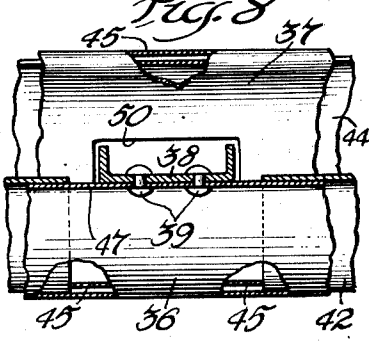
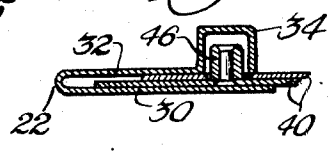


Fig. 9



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Fig. 10

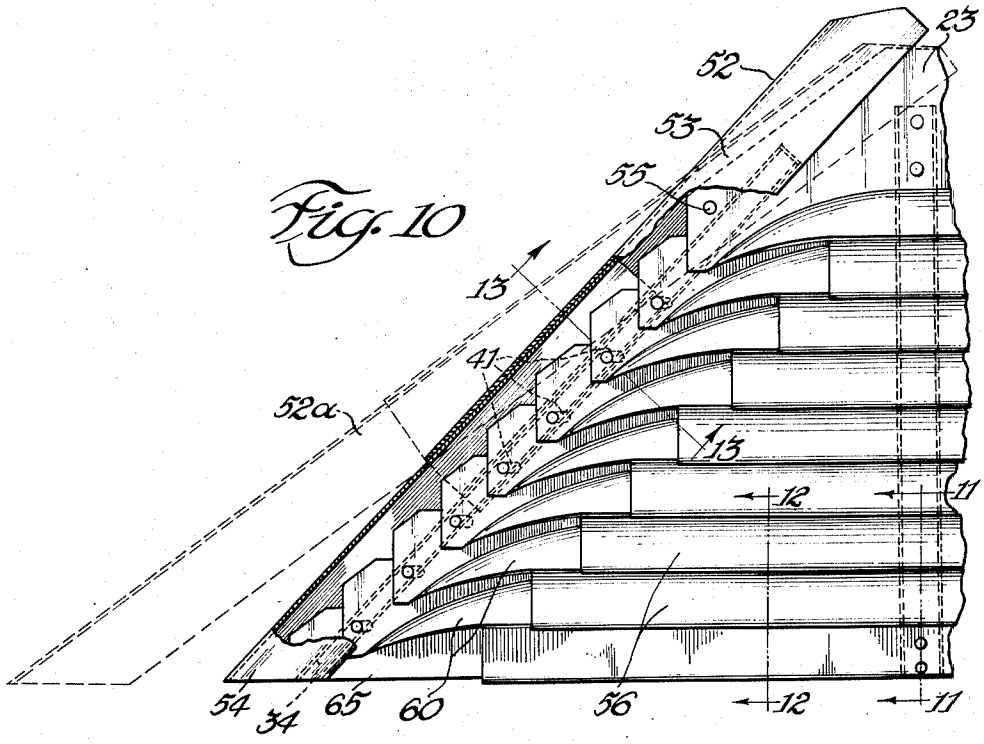


Fig. 11

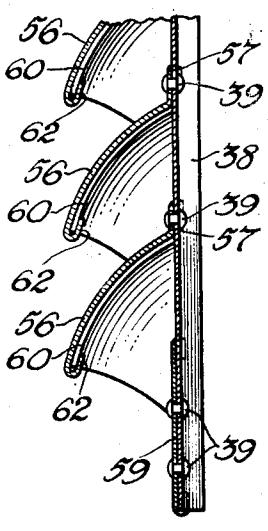


Fig. 12

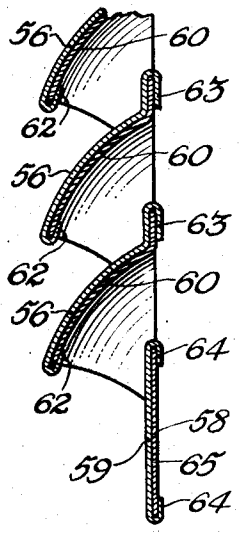
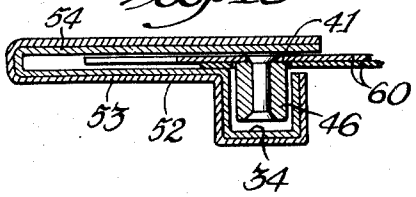


Fig. 13



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ADJUSTABLE LOUVER TYPE VENTILATOR

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Application July 11, 1950, Serial No. 173,182

18 Claims. (Cl. 160—223)

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The invention relates to adjustable louver type ventilator structures, and has particular adaptation to fit gables and the like having various roof pitch angles.

One of the general objects of this invention is to provide a louver type ventilator structure adapted to placement at the gable of a building, and which is not only adjustable to fit various roof pitch angles, but which maintains relatively, uniform spacing between the louver slats when adjusted to various angles.

As another object, my invention has within its purview the provision of an adjustable gable ventilator in which louver slats overlap one another internally and externally of the general plane of the ventilator structure, so as to provide increased weather protection.

My invention has for another object the provision of a laterally adjustable louver type ventilator structure embodying a series of adjacent and separated louver slats, which slats include telescopically engaging parts constructed and arranged so that similar and opposed end parts are movable longitudinally relative to a stationary intermediate part.

It is a further object of my invention to provide an adjustable louver type ventilator structure incorporating angularly disposed and movable side rails having extensible louver slats adjoined thereto and to one another through connections providing for relative linear movements between the slats and between the side rails and slats as the side rails are moved angularly relative to one another.

Another object of this invention is to provide an adjustable louver type ventilator having any one or more of the foregoing characteristics and so constructed and arranged that the parts are adapted to manufacture from formed sheet metal and to ease of assembly.

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 three sheets of drawings:

Fig. 1 is a front elevational view showing the adaptation of a preferred form of my adjustable louver type ventilator to the gable of a building which is depicted fragmentarily;

Fig. 2 is a front elevational view of the louver structure shown in Fig. 1, drawn to a somewhat larger scale and having a part of the structure broken away to illustrate details of construction;

Fig. 3 is a rear elevational view of the louver

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structure shown in Fig. 2, and which also has a part broken away to show details of the construction;

Fig. 4 is a fragmentary rear elevational view of a portion of the structure shown in Figs. 1, 2 and 3, drawn to a larger scale than those figures and having parts broken away to show structural details, as well as having different relative positions of the parts illustrated in dotted lines to show the manner in which my ventilator is adjustable to fit various roof pitch angles;

Fig. 5 is a fragmentary sectional view wherein the section is taken substantially on a line 5—5 of Fig. 4;

Figs. 6, 7 and 9 are also fragmentary sectional views wherein the sections are taken substantially on lines 6—6, 7—7 and 9—9 respectively, of Fig. 4, and in the directions indicated by accompanying arrows;

Fig. 8 is a fragmentary sectional view taken substantially on a line 8—8 of Fig. 6 and viewed in the direction indicated by arrows;

Fig. 10 is a fragmentary rear elevational view similar to Fig. 4, but illustrating a modification of my adjustable louver type ventilator; and

Figs. 11, 12 and 13 are respectively sectional views taken substantially on lines 11—11, 12—12 and 13—13 of Fig. 10, in the directions indicated by arrows.

In order to have a reasonable range of adaptability, gable ventilators and the like must necessarily be adjustable angularly, in order to fit the gable pitch angles of the roofs of various buildings and types of buildings. The various adjustable louver structures now known are either not angularly adjustable, or the louver slats are so hingedly connected to the supporting side rails of the structure that their spacing varies with the angular adjustment of the supporting side strips. That is, with the louver slats hingedly connected to the angularly adjustable supporting side strips, the slats move closer together and thereby reduce the ventilating spaces therebetween when the side strips are spread for a wide pitch angle, and move farther apart as the supporting side strips are brought closer together to fit a steep pitch angle. In the disclosed structure, I have not only provided a solution for the problem of maintaining uniform spacing between the louver slats as the supporting side strips are adjusted to fit various pitch angles, but I have also provided a louver structure which is adapted to quantity production and to provide improved weather protection.

Referring generally to the exemplary embodi-

ments of my adjustable louver type ventilator which are depicted for illustrative purposes in the accompanying drawings, Fig. 1 shows the adaptation of a preferred form of my ventilator ensemble 15 to the gable portion of a building 16, wherein the ventilator ensemble is mounted in practically flush relationship to siding boards 17 at the apex of a pitch roof 18, and wherein the ensemble is adjustable to fit snugly into the angle formed between gable trim strips 19 of the building.

Giving further general consideration to the structure of my preferred ventilator ensemble, it includes formed sheet metal side rails 20 and 22 having adjacent end portions and extending in angular relationship relative to one another. A louver plate 23 closes a small portion of the space between the adjacent ends of the side rails and at the vertex of the angle formed between the side rails. Below the top louver plate 23, a series of extensible louver slats 24 extends laterally between the side rails with the slats in substantially parallel relationship to one another and spaced from one another at the mid-portions to provide ventilating air passages 25. A bottom extensible louver slat 26 extends across the bottom of the series of louver slats and provides a substantially flat bottom flange portion 27 for the ensemble.

Considering the disclosed structure in greater detail, as shown in Figs. 1 to 9 of the accompanying drawings, the side rails 20 and 22 are folded along their outer edges, whereby the side rail 20 has front and rear portions 28 and 29 in opposed and face-to-face relationship, and the side rail 22 has front and rear portions 30 and 32 in opposed and face-to-face relationship. Along their inner edges, the side rails 20 and 22 are open to receive the end portions of the louver plate 23 and the louver slats 24 between the front and rear portions thereof, as will be more fully described. Along the inner margins of the rear portions 29 and 32, guide means in the form of longitudinally extending channels 33 and 34 respectively are integrally formed therein; the channels 33 and 34 being of substantially rectangular section and opening inwardly toward the portions 28 and 30 respectively, as indicated in Figs. 5 and 9. Also, as shown in Fig. 5, and after the parts of my ventilator are assembled, the opposite ends of the respective channels are preferably closed by integrally formed tabs, such as 35, folded over the channel ends.

It being one of the purposes of this invention to provide a ventilator structure in which substantially uniform spacing is maintained between the adjacent louver slats, regardless of the adjustment of the angular positions of the side rails 20 and 22, each of the extensible louver slats 24 below the louver plate 23 includes a substantially stationary louver part 36, and the bottom louver slat 26 includes a stationary louver part 37. The top louver plate 23 and the stationary louver parts 36 and 37 are secured in their properly spaced relationships to a spacer rail 38 by fastening means such as rivets 39. The spacer rail 38, in the disclosed structure, is disposed in the general plane of the side rails 20 and 22 and extends from the adjacent ends of those side rails in a direction such that it divides the angle between the side rails along the mid-portion thereof.

Each of the louver slats 24, in addition to the stationary louver part 36, has movable end parts 40 and 42 telescopically engaged with the stationary louver parts 36 in opposed relationship to one another and longitudinally slidable relative to the stationary louver parts; while the bottom louver slat 27 likewise has movable parts 43 and 44 in opposed relationship at the opposite ends of the stationary louver part 37, and telescopically engaged with the latter louver part for longitudinal sliding movements. In my disclosed structure, the telescopic engagement of the stationary and movable louver parts is accomplished by having complementary sectional shapes for the engaged portions of the louver parts and by providing return bent flanges 45 along the opposite longitudinal edges of the stationary louver parts which overlie and slidably receive the opposite margins of the movable louver parts at the opposite ends of the stationary parts.

In each instance, the outer ends of the movable louver parts are substantially flat and are shaped to fit between the front and rear portions of the side rails in overlapping relationship to one another. Also, the top louver plate has marginal portions which are overlapped by the front and rear portions of the side rails and which overlap the adjacent extensible louver slat. While the top louver plate is overlapped by the front and rear portions of the side rails within any normal angular position to which those side rails are adjusted relative to one another, the extensible louver slats vary sequentially in length from the top louver plate and are sufficiently variable in length to extend laterally between the side rails as those rails are moved angularly toward and from one another. The lengths of the louver parts determine the minimum angle of adjustment of the side rails and also the range of movements thereof which can be attained for adjustment purposes. In the disclosed structure, the stationary louver parts are successively longer from the stationary louver plate downwardly of the ensemble and those parts overlap the major portions of the movable louver parts when the louver ensemble is collapsed; the overlapping portions of the louver slats varying in length, because of the increased extension of the lower louver slats as the side rails are moved angularly relative to one another. As herein depicted, the movable louver parts extend inwardly from the side rails to substantial abutment with the opposite sides of the spacer rail 38 when the ensemble is collapsed.

As depicted in Figs. 3, 4 and 9, each of the movable end parts of each extensible louver slat has a stud 46 secured thereto and extending into one of the side rail channels 33 or 34 to connect the respective end portions to the side rails, so that extension and contraction of the respective louver slats is effected by relative angular movements of the side rails. Also, since the louver slats are maintained in a fixed spacing relationship relative to one another, the studs 46 move linearly along to the respective channels 33 and 34 during relative angular movements of the side rails, with the channels 33 and 34 acting as guides for such movements. Further to maintain proper alignment of the parts during their adjusting movements, the studs 46 extend through slots 41 in the overlapping portions of the adjacent movable parts of the louver slats. These slots extend longitudinally of the louver slats and are of sufficient length to permit the required relative movement between adjacent louver slats, as necessitated by the differences of their extensions as the side rails are moved angularly.

Extension or retraction of the louver slats may be effected by manual force applied to the

side rails in a manner to produce relative angular movements thereof. The engagement of the studs 46 in their respective guide channels not only transfers the required force to move the end parts relative to the stationary louver parts, but changes of the angular dispositions of the guide channels result in movements of the respective studs along the channels to maintain the spacing between louver slats which is established by the spacer rail and by the extension of the studs through slots of the adjacent slats. In the form of my invention which is depicted in Figs. 1 to 9 inclusive, the side rails have an initial length which is sufficient to accommodate the slats at their fully extended positions. If the ventilator ensemble is installed where the roof pitch does not require full extension of the louver slats, the side rails may be cut off, if desired, after adjustment of the ventilator to the required pitch angle. The solid line disclosure of Fig. 4 shows the relative positions of parts when the louver slats are collapsed; while the dotted lines indicate the relative positions of the parts when the side rail is moved outwardly to a position indicated at 22*a*, at which position the louver slats are extended. In this figure, the various extensions of the series of louver slats which accompanying a predetermined angular movement of the side rail may be observed.

Figs. 1 to 8 of the drawings also illustrate an embodiment of my preferred ventilator structure in which the louver slats are constructed and arranged to give maximum weather protection without appreciably diminishing the ventilation. To accomplish this result, the stationary and movable louver parts, in addition to being complementarily shaped in section, each have longitudianally extending and substantially coplanar strip portions 47, as shown in Figs. 6 and 7, extending along the mid-portions thereof. Along the opposite upper and lower edges of the strip portions 47, oppositely curved louver portions 48 and 49 extend upwardly and downwardly respectively and to opposite sides of the plane of the strip portions. When mounted, as shown in Figs. 6 and 7, the upwardly extending louver portion 48 of one louver slat overlaps the downwardly extending louver portion 49 of the adjacent louver slat and is in spaced relationship thereto to define the air passages 25. When mounted, the downwardly extending louver portions 49 face outwardly of the building, while the upwardly extending portions 48 are on the interior to afford additional shielding against driving rain, snow or the like. As illustrated in Figs. 6 and 8, openings 50 are provided through the mid-portion of each of the stationary louver parts adjacent the strip portions 47, through which openings, the spacer rail 38 extends. With this arrangement, the spacer rail is secured to the strip portions at the middle of the stationary louver parts.

In the form of my invention which is depicted in Figs. 10 to 13 inclusive, the general structure and arrangement of parts of the ventilator ensemble, as well as the general operation and adjustment, are quite similar to the form illustrated and described. While double louvers which give the added weather protection were illustrated in Figs. 1 to 9 inclusive, and single louvers are shown in Figs. 10 to 13 inclusive, it may be understood that the main features of difference between the two forms of ventilators are adaptable to either single or double louvers. The description of the modification of my invention which is illustrated in Figs. 10 to 13 will be mainly devoted to the differences of that structure from the one previously described.

As one element of difference, side rails such as 52 of the ventilator have telescopically engaging upper and lower parts 53 and 54. While, as shown in Fig. 13, the sectional shapes of the side rail parts are generally similar to those of the form shown in Figs. 1 to 9, the telescoping engagement of the upper and lower side rail parts affords sliding movement between those parts, whereby the lengths of the side rail may be adjusted to fit any adjustable extension of the louver slats. In addition to providing extensible side rails, the form of my invention illustrated in Fig. 10 also has a pivotal connection provided between the top louver plate 38 and each of the side rails; the respective side rail portions 53 being pivotally connected to opposite side portions of the top louver plate 23 by fastening means, such as rivets 55. It may be readily understood that the rivets 55 provide axes for the angular adjustment of the side rails relative to one another. The portion of Fig. 10 which is shown in dotted lines at 52*a* indicates one of the side rails in an extended position which corresponds to an expanded position of the extensible louver slats.

In the single louver construction depicted in Figs. 10 to 13, as contrasted to the double louvers of Figs. 1 to 9, stationary louver parts 56 have coplanar marginal strip portions 57 at the longitudinal mid-portions thereof which are secured to the spacer rail 38. In their spaced relationship, the outwardly curved and downwardly extending louver portions of the louver slats overlap the adjacent louver slats to some extent, and the bottom louver slat overlaps a substantially plane bottom strip 58 which includes a stationary part 59. As in the previously described form, the louver slats include movable end parts 60 which conform to and telescopically engage the opposite ends of the stationary louver parts. Along their outer margins, the stationary louver parts have return bent flanges 62 which overlie the outer edges of the movable louver parts. Also, the strip portions of the stationary louver parts have return bent flanges 63 which overlie marginal portions of the movable louver parts. Along the opposite margins of the stationary bottom part 59, opposed return bent flanges 64 overlie the margins of the movable end parts 65 of the bottom strip 58.

As shown in Fig. 10, the outer end portions of the movable end parts of the louver slats are substantially plane and overlap the end parts of an adjacent louver in the assembled relationship of the louver slats. As in the previously described form, the adjacent and overlapping end portions of the movable slat parts are interconnected by studs 46 which extend through longitudinally elongated slots 41 in the adjacent louver slat and thence into the guide channel 34 of the side rails.

From the foregoing description and reference to the accompanying drawings, it may be understood that I have provided a louver type ventilator of generally triangular shape which is suited to quantity production and which is adjustable to suit the roof pitches of various buildings within a considerable range. This structure is adapted to the use of either single or double type louvers of an extensible telescopic type and in each instance, uniform spacing is maintained between the louvers irrespective of the adjusted angle of the side rails. In one dis-

closed form, the side rails are of sufficient length to provide for full extension of the slats and may be trimmed to a shorter length if desired. In the other form, the side rails include telescopically engaging parts so that the lengths thereof are adjustable to suit the other adjusted dimensions of the louver ensemble.

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. An adjustable louver type ventilator comprising, in combination, angularly disposed side rails, each folded along its outer edge and having front and back portions in face-to-face relationship, one of said portions of each side rail including a channel formed therein and extending longitudinally thereof, a spacer rail substantially in the general plane of the side rails and extending between the side rails and dividing the angle formed thereby, a top louver plate secured to the spacer rail at the end thereof at which the side rails approach one another and filling the space between the adjacent ends of the side rails, and a series of extensible louvers in overlapping and substantially parallel relationship below said top louver plate, said extensible louvers each having an intermediate part secured to the spacer rail and end parts extending from opposite ends of the intermediate part and slidable relative thereto, and said end parts having end portions extending between the front and back portions of the side rails and connected to the side rails by stud means slidable in said channels of the side rails.

2. An adjustable louver type ventilator as defined in claim 1, and wherein said stud means on each of the end parts extends through a longitudinal slot on the adjacent end part.

3. An adjustable louver type ventilator as defined in claim 1, and wherein each of said extensible louvers between the top louver plate and the bottom extensible louver includes upwardly and downwardly extending louver portions on opposite sides of the longitudinal intermediate strip portion, and wherein said upwardly and downwardly extending louver portions on adjacent louvers are mounted in opposed and spaced relationship on opposite sides of a common plane passing through said strip portions.

4. An adjustable louver type ventilator as defined in claim 1, and wherein said side rails are pivotally connected to opposite end portions of the top louver plate and are swingable laterally relative thereon.

5. An adjustable louver type ventilator comprising, in combination, side rails having adjacent end portions and extending angularly therefrom, each of said side rails including guide means extending longitudinally thereof, a spacer rail substantially parallel to the general plane of the side rails and extending intermediate the side rails away from the adjacent ends thereof, a series of extensible louvers in substantially parallel relationship and extending laterally of the spacer rail between the side rails, said extensible louvers each having an intermediate part secured to the spacer rail and end parts telescopically and slidably engaging opposite ends of the intermediate part, and said end parts being connected to the side rails by stud means slidable in said guide means thereof.

6. An adjustable louver type ventilator as defined in claim 5, and wherein each of said extensible louvers except the bottom-most one has a substantially plane longitudinally extending central portion, from the opposite longitudinal edges of which curved louver portions extend in opposite angular directions and with opposite curvatures, and wherein said extensible louvers are mounted with oppositely projecting louver portions in opposed spaced and successively overlapping relationship to one another.

7. An adjustable louver type ventilator as defined in claim 6, and wherein said spacer rail extends through aligned openings in the louver portions of the intermediate louver parts and is secured to the substantially plane central portions thereof.

8. An adjustable louver type ventilator as defined in claim 5, wherein a top louver plate closes the space between the adjacent ends of the side rails and the top one of the extensible louvers, and said side rails are pivotally connected to opposite lateral sides of the top louver plate.

9. An adjustable louver type ventilator comprising, in combination, side rails extending in angular relationship from adjacent end portions, each of said side rails including guide means extending longitudinally thereof, a series of extensible louvers in substantially parallel relationship and extending between the side rails and having ventilating spaces therebetween, said louvers having end parts connected to the side rails by means slidable in the guide means longitudinally of the side rails, and means for maintaining the ventilating spaces between the louvers when the side rails are moved angularly relative to one another.

10. An adjustable louver type ventilator as defined in claim 9, and wherein opposite ends of the extensible louvers are connected to the adjacent louvers independently of the side rails by means tending to maintain uniform spacing between the adjacent louvers and affording relative longitudinal movement between adjacent louvers as the side rails are moved angularly relative to one another.

11. An adjustable louver type ventilator comprising, in combination, side rails extending in angular relationship to one another from adjacent end portions, a plate for closing the angular space between the adjacent ends of the side rails, the adjacent end portions of the side rails being pivotally connected to opposite ends of said plate for swinging movements in a common plane, and a plurality of extensible louvers extending between the side rails and having their opposite ends movably connected to the side rails.

12. In an adjustable louver type ventilator, the combination comprising a series of longitudinally extensible louver slats, each of said slats including an intermediate guide part having a predetermined sectional configuration and having folded guide flanges along the margins thereof, and end parts conforming to the sectional configuration of the intermediate guide parts and fitting between the guide flanges at opposite ends thereof, and a spacer member extending across the intermediate guide parts of the slats and having said slats secured thereto.

13. In an adjustable louver type ventilator, the combination comprising side rails angularly dis-

posed and angularly movable relative to one another, louver slats of varying lengths extending between the side rails and having ventilating openings therebetween, said louver slats each being longitudinally extensible, means for maintaining a predetermined spacing between adjacent slats, and means connecting the slats to the side rails for movements rotationally and linearly relative thereto.

14. In an adjustable louver type ventilator as defined in claim 13 and wherein said side rails embody telescoping parts which are extensible and retractable relative to one another to adjust the length of the side rails to correspond to the positions of the slats longitudinally of the side rails.

15. An adjustable louver type ventilator, comprising a pair of frame members associated with one another for relative movement and extending in diverging relation to each other, a plurality of telescopic louvers extending between the diverging frame members, means slidably connecting opposite ends of each of the telescopic louvers to the adjacent frame members, and means for effecting control of the displacement between adjacent louvers to compensate for the normal tendency of that spacing to change with a variation in the divergence between the frame members.

16. An adjustable louver type ventilator comprising a pair of frame members associated with one another for relative movement and extending in diverging relation to each other, a plurality of telescopic louvers extending between the diverging frame members, means slidably connecting opposite ends of each of the telescopic louvers to the corresponding frame members, and means for effecting control of the displacement lengthwise of the frame members between end portions of adjacent louvers to counteract the normal tendency of such displacement to change with a variation in divergence between the frame members.

17. An adjustable louver type ventilator comprising a pair of frame members associated with one another for relative movement and extending in diverging relation to each other, a plurality of spaced extensible louvers extending between the frame members, each of said frame members having longitudinally extending recess means, and means on opposite ends of each of the louvers slidably penetrating the recess means in the frame members whereby the extensible louvers facilitate adjustment of the frame members as to divergence with respect to each other and whereby the recess means facilitate adjustment of the louvers as to their displacement longitudinally of the frame members.

18. In an adjustable louver type ventilator, the combination comprising side rails angularly disposed and angularly movable relative to one another, louver slats of varying lengths extending between the side rails and having ventilating openings therebetween, said louver slats each being longitudinally extensible, means for adjusting longitudinally of the frame members the displacement between the ends of adjacent louvers in accordance with a variation in angular displacement between the frame members, and means connecting the slats to the side rails for movements rotationally and linearly relative thereto.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,380,980	Lane	June 7, 1921
1,733,770	Andrake	Oct. 29, 1929
2,195,704	Mantz	Apr. 2, 1940
2,458,134	Belden	Jan. 4, 1949
2,509,016	Peterson	May 23, 1950
2,587,509	Moyer	Feb. 26, 1952