April 2, 1940. H. HOVLAND 2,196,070

WINDOW VENTILATOR

Filed May 19, 1937

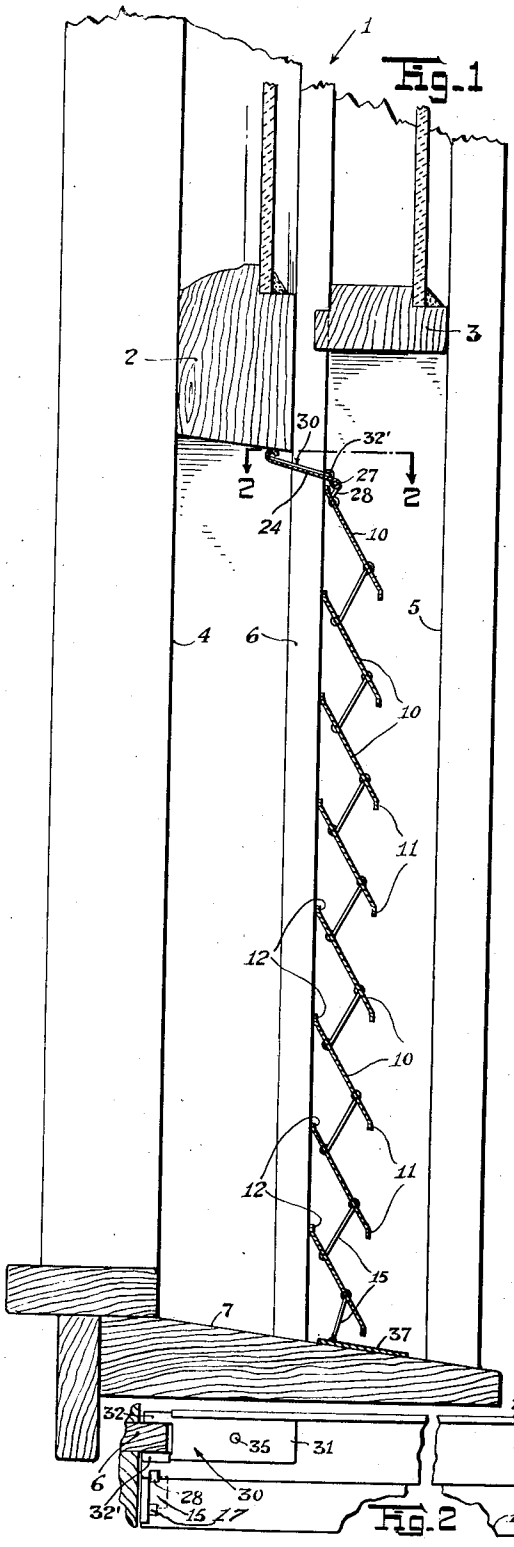


Fig. 1

Fig. 2

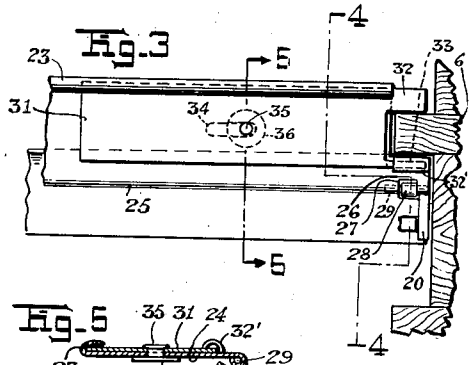


Fig. 3

Fig. 5

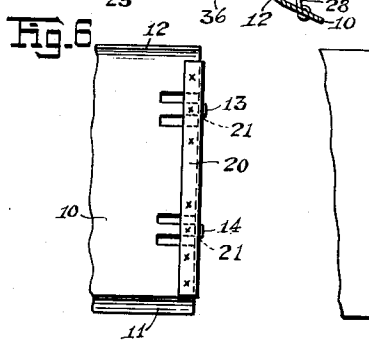


Fig. 6

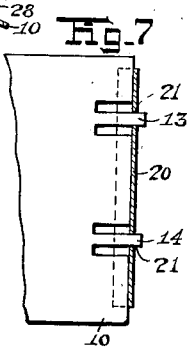


Fig. 7

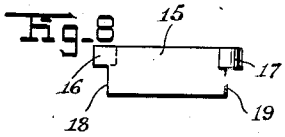


Fig. 8

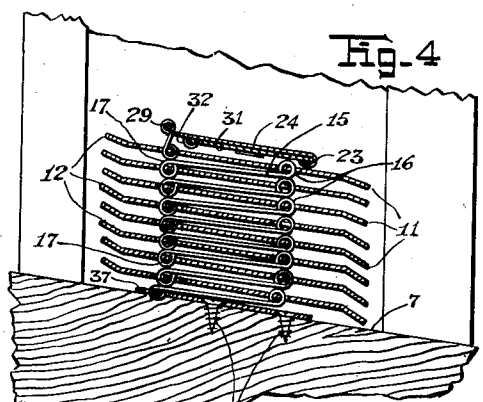


Fig. 4

INVENTOR
HENRY HOVLAND
BY
ATTORNEY

Patented Apr. 2, 1940 2,196,070

UNITED STATES PATENT OFFICE

2,196,070

WINDOW VENTILATOR

Henry Hovland, Williston Park, N. Y.

Application May 19, 1937, Serial No. 143,507

7 Claims. (Cl. 98—99)

The present invention relates to window ventilators and more particularly those of a collapsible type.

Heretofore various forms of ventilators adapted to deflect the air entering through an open window have been proposed. They are generally of two forms, namely, one form which is of the extensible type and removably positioned beneath the bottom sash of the window and intended to be removed when it is desired to close the window. The other form of ventilators includes those which are designed to be permanently secured on the outside of the window and generally of a collapsible type. The commercial success of both forms of ventilators has been rather indifferent as each has its disadvantages. For example, the extensible type frequently is wet from the rain and snow and is rather messy to remove from the window in such condition. Those ventilators which are permanently fastened on the outside of the window are objectionable for many reasons, chief of which are that they fit loosely on some form of special mounting and therefore rattle, or else they do not extend the full width of the window sash and thus fail to give full protection from the elements.

It is an object of my invention to provide an improved window ventilator of the collapsible type, characterized by simplicity of construction, practicability and economy of manufacture.

Another object is the provision of a ventilator of the collapsible type which may be easily and permanently mounted within the window casing and not interfere with the operation of the sashes or the installation of an outside screen.

Another object of the invention is the provision of a ventilator which when in operative position eliminates the possibility of rain or snow entering the room through spaces between the ends of the ventilator and the window casing.

A further object is the provision of an expansible ventilator with a self-gripping fastening means which when brought into engagement with the guide strips between the inner and outer sashes, holds the ventilator at any articulated height beneath the bottom part of the upper sash.

A still further object of the invention is to combine in a ventilator of the collapsible type all of the advantages of a removable form of ventilator and at the same time eliminate the disadvantages of an outside blind or shutter, such as requiring special mountings and/or housings, being offensive to the aesthetic tastes, cumbersome, etc.

A special object is the provision of a ventilator of an articulated type, the entire assemblage of which may be made from metal stampings.

Other novel details of construction and the arrangement of parts which are exemplified in the accompanying drawing and manifested from the following description are additional objects of the invention.

Referring to the accompanying drawing:

Fig. 1 is an elevational cross section of a window ventilator embodying my invention;

Fig. 2 is a plan view taken on the line 2—2 of Fig. 1 and with parts broken away, of the ventilator held in operating position;

Fig. 3 is a fragmentary view of one end of my ventilator, showing particularly the construction employed for securing the ventilator to the window casing;

Fig. 4 is a cross sectional view of the ventilator taken along the line 4—4 of Fig. 3;

Fig. 5 is a cross section, taken on the line 5—5 of Fig. 3 of the top slat of the ventilator;

Fig. 6 is a fragmentary detail view showing the hinge fastener for hinging the slats forming the ventilator;

Fig. 7 is a similar view showing detail of construction for hinging the slats; and

Fig. 8 is a view of one type of link used to hinge the slats to one another.

Referring to the drawing, a double hung sash window casing, designated generally by the reference number 1, is provided with lower sash 2 and upper sash 3 slidably mounted in the casing, said sashes sometimes hereinafter being referred to as inner and outer sashes, respectively. On each side of the casing the sashes 2 and 3 have runways 4 and 5 respectively, and are separated from each other by oppositively disposed guide rails or strips 6, the bottom of the outer sash 3 having cut-away portions to receive the adjacent edge of said guide strips 6. (See Fig. 1.) Sash cords and weights, not shown, are provided for raising and lowering each of the sashes 2 and 3 to any desired distance. The construction thus far described is standard, particularly with respect to wooden casings, and will therefore be fully understood by those skilled in the art.

My ventilator comprises a series of duplicate slats 10 formed preferably of sheet material such as sheet steel which may be weatherproofed in any suitable manner. The slats 10 have a main flat body portion having the longitudinal edges 11 and 12 thereof reversely bent so that when assembled the outer edge 11 and inner edge 12 are inclined downwardly and upwardly respec-

tively. The ends of slats 10 are provided with cut-out tongue members 13 and 14 which are spaced nearer the edges 11 and 12 than to the center of the body portion of said slats. The tongue members 13 and 14 project slightly beyond the ends of the slats 10, the purpose of which will hereinafter be more fully described.

For linking the several slats 10 together, I provide a plurality of duplicate right and left hand members 15, hereinafter sometimes referred to as links or hinges, each of which comprises a rectangular-shaped body portion having at each end oppositively disposed reduced portions which are curled inwardly to form reversely positioned cylindrical sockets 16 and 17. The difference in construction between right and left links is the positioning of the sockets 16 and 17 with respect to the longitudinal edges of the body portion of the links 15. That is to say, regarding the link shown in Fig. 8 as a right hand link, a left hand link would have the sockets 16 and 17 formed adjacent the lower longitudinal edge of said link. However, for the sake of convenience in describing the hinge construction reference characters will only be applied to right hand links and right hand tongue members 13 and 14, it being understood that the left hand parts are duplicate except reversely formed. The diameter of the sockets 16 and 17 is slightly greater than the width of the tongue members 13 and 14 so that the latter may be journalled in said sockets 16 and 17; it will be noted that shoulders 18 and 19 are formed adjacent the sockets 16 and 17 and the function of said shoulders and socket members will now be explained.

As mentioned above, the means for connecting the several slats 10 so that they will articulate properly and at the same time simplify the assemblage is an important feature of my invention. A pair, one right and the other left, of hinge members 15 is used between each of the slats 10; in the case of a left hand link member the socket 17 is slipped over the tongue 13 of the bottom slat and the tongue 14 of the slat next above is slid into the socket 16. As the hinges 15 are placed upon the tongues 13 and 14, in the manner just mentioned, they are thus each loosely connected to opposite sides of adjacent pairs of slats and to secure said hinges in place I provide U-shaped fastening members 20, somewhat shorter in length than the width of the slats 10 and having their lateral sides spaced apart slightly farther than the thickness of said slats 10. The fastening members 20 are provided with apertures 21 adapted to register with the tongues 13 and 14 and after said tongues have been inserted in said apertures their projecting ends are bent over on to the fasteners 20. (See Fig. 6.) It should be noted that the depth of the fastening members 20 is such that when said member abuts against the end of the slats 10 it will afford a substantial fastening means without causing the hinge members 15 to bind. If desired the members 20 may be spot welded, as illustrated in Fig. 6, in addition to bending over the protruding ends of the tongues 13 and 14; naturally this operation increases the cost of manufacture and my construction does not require same.

The top slat 24 differs from the slats 10 inasmuch as it carries the gripping mechanism forming part of the fastening means for securing the ventilator to the window casing 1 in an operative position. The edges 23 and 25 of slat 24 are reversely rolled back upon the body of the slat, as shown in the drawing, particularly Figs. 3 and 4. For about three-quarters of its width, and including the edge 23, the length of slat 24 is slightly less than the distance between opposing guide strips 6. For the remainder of its width and including the edge 25, the slat 24 is the same in length as slats 10. The extending portions 26 along the edge 25 are hinged to the adjacent edge of the next slat 10 in such a manner that slat 24 may be folded upwardly and inwardly in securing the top of the ventilator to the guide strips 6. The hinge construction comprises a cut-out portion 27 made at each end of the slat 24 and along the edge 25, the opening thus formed being adapted to receive a short link 28, see Figs. 1 and 5, which is a modification of the link 15 in that the reversely formed sockets 16 and 17 are spaced closer together and the body portion of the link has no shoulders, being the same width as the sockets 16 and17. One end of the links 28 is hinged to the slat 24 by means of short pins 29 having their bearings in the rolled edge 25 of said slat 24, and the other end of said links 28 is connected to the next lower slat 10 by the tongues 14 in the manner above described.

To secure the ventilator to the window casing 1 I provide a pair of catches, designated generally by the reference character 30, each comprising a slide 31 slidably mounted adjacent the ends of slat 24. The rolled back edge 23 forms a groove at each end of the slat 24 within which the adjacent longitudinal edge of each of the slides 31 may be reciprocated. The outer ends of the slides 31 are bifurcated, forming projections 32 and 33 spaced apart a distance slightly greater than the width of the guide strips 6; said projections 32 and 33 being somewhat shorter than the depth of said guide strips 6 so that when the slides 31 are held horizontal and moved into engagement with said strips 6, said projections fit snug without binding. The projections 33 of the slides 31 are reciprocably journalled in collars 32' formed from the slat 24 in any suitable manner as by rolling. To reciprocate the slides 31 I provide longitudinal slots 34 in the slat 24, through which pass rivet members 35, having one end riveted to said slides 31 and the other end secured to finger pieces 36. By exerting pressure upon the finger pieces 36, or otherwise gripping the same, the slides 31 may be moved back and forth along the slat 24, the outer ends of the slots 34 constituting stops against which the rivet members 35 abut, thus limiting the inner movement of said slides 31, but providing sufficient end play so that slight variations in the width of the casing 1 are thus taken care of.

The ventilator is secured to the window sill by means of a stationary base plate 37 having holes which accommodate screws 38. The next upper slat 10 is hinged to the base plate 37 by a pair of hinges 15 in the same manner as the several slats are connected.

From the foregoing the mounting and operation of my ventilator will be easily understood. It may be marketed in an assembled form because of the collapsible construction; the links and slats normally nest closely together. The purchaser merely fastens the base plate 37 to the sill 7, so that the slats 10 may articulate within the runways 5 of the upper sash 3. When the ventilator is not in use it will be nested on the sill 7 and when the inner sash 2 is closed the ventilator in its collapsed condition will not be noticeable from within the room.

When it is desired to place the ventilator in operation, it is raised to any height by gripping the slat 24 and lifting the same. This causes the adjacent slat 10, through its link connection 28 with the slat 24, to move upwardly, and in so doing it is tilted down outwardly and drawn inwardly at the same time against the guides 6 until the shoulders 18 of the links 15 impinge against the under surface of the body portion of the top slat 10, thereby constituting a fulcrum about which the second slat 10 is tilted downwardly until similarly arrested by the shoulder 19 of the hinge member 15 impinging against the upper surface of the body portion of said second slat 10. By this arrangement the hinges 15 comprising the linkage between the slats serve not only as spacing means between the successive slats but also determine their inclination from the horizontal. It will therefore be appreciated that the length of the hinge members 15, and the location of their points of attachment to the slats roughly control the spacing and pitch or inclination of said slats when the ventilator is articulated. Further, the cylindrical head or socket formed upon each end of the hinge members 15 function as spacers thus preventing the slats sticking together when folded or unfolded. The metal links 15 are somewhat resilient, that is, each link constitutes a flat metal spring with its shoulders 18 and 19 bearing against the slats 10 when the ventilator is extended; and due to the resiliency of links 15, the slats 10 are tensioned against the guide strips 6, and engagement between the ends of slats 10 and the guide strips 6 is thereby maintained.

After the ventilator has been raised to any desired height the slat 24 is turned upwardly and inwardly about its hinge members 15 and the catch 30 caused to grip the guide strips 6 by holding said slat 24 substantially horizontal and moving the slides 31 outwardly until the bifurcated portions of said slides engage the adjacent surfaces of the guide rails 6. Then by releasing the grip on the slat 24 it will be turned down outwardly by its weight to a slight incline, thus causing the projections 33 and collars 32' to bind upon the guide strips 6 in such a manner as to constitute a self-adjusting locking means for holding the ventilator in any desired position by a simple manipulation. It will, of course, be understood that sufficient slats are provided to permit the extension or articulation of the ventilator to the full height of the lower sash 2, and when said sash 2 is drawn flush, see Fig. 1, with the inner edge of the slat 24 the amount of ventilation can be thus roughly regulated within a given range depending upon outside weather conditions and the fancy of the occupant of the room. At the same time any rain or snow will be deflected by the inclined body portions of the slats.

When it is desired to close the sash 2, the ventilator may be collapsed by merely gripping the slat 24 and by raising or turning it to a horizontal position, which movement relieves the binding action of the projections 32 and 33 on the guide strips 6. The slides 31 may then be retracted by means of finger pieces 36, and when the projections 32 and 33 have cleared the strips 6 the slat 24 is rotatable outwardly about its pivot points. The weight of the articulated slats is sufficient to effect the collapse thereof to a nested position on the sill of the window casing.

From the above it is obvious that by making the slats 10 substantially the same length as the width of the runways 5 of the window casing 1, a fairly snug fit may be obtained without the ends of said slats 10 binding on said casing, and the flexible nature of the hinges 15, together with the link arrangement for hinging the slat 24 to the adjacent slat 10, greatly reduces the tendency of the ventilator to rattle when shaken by the elements. In effect the casing 1 forms a housing for the ventilator as it is entirely confined within the runways 5 thereof, and of such construction as not to require any special guide rods, fastenings, supports or the like. Further, it is sufficiently protected from snow, sleet and inclement weather as to be practical for winter use. Also the ventilator does not interfere with the installation of the customary form of screen on the outside of the window during the summer months.

The inherent rigidity and/or resiliency of certain sheet material, as for example sheet steel, makes it possible to secure an assembled structure comparatively light in weight and at the same time sufficiently strong to resist deformation that otherwise might be caused by ordinary wear and tear. However, if it is desired to reinforce the assemblage illustrated this may be done in several ways which would suggest themselves to those skilled in the art. For example, another set of hinges could be added intermediate to those on the ends of the slats 10, and any suitable expedient used to secure such additional hinges to said slats. However, all such modifications detract from the original simplicity of my ventilator and have not been found necessary in practice. The principal feature of my invention is the provision of an assemblage composed of parts or elements which may be punched or formed of sheet material, easily assembled, and at the same time be serviceable in practice.

Although my invention is characterized by simplicity of construction, changes may be made by those skilled in the art without departing from the spirit thereof. For example, the slats may be made of suitable wood and the hinge construction modified to form a linkage between such slats as good designing or approved practice might indicate. One such arrangement would be to hinge the connecting links on the ends of the wooden slats so that they would operate in the fashion of a lazy tongs when the ventilator was collapsed or articulated. It is my desire to cover all such changes and modifications as come within the appended claims.

What is claimed is:

1. In combination, a window casing having upper and lower sashes, a runway for each of said sashes, guide strips separating said sashes, an expansible ventilator comprising a plurality of slats, hinge members for loosely connecting opposite sides of adjacent slats at each end thereof, a stationary base plate hinged to the lowermost slat and secured to the window sill, catches carried near the ends of the uppermost slat, each of said catches consisting of a slidable plate provided with projections adapted to engage said guide strips under the weight of the articulated slats when the ventilator is in operating position.

2. In combination, a window casing having upper and lower sashes, guide strips separating said sashes, an expansible ventilator comprising a series of slats each having at each end a pair of integrally formed tongue members, links forming an articulating connection between said tongue members of adjacent slats, means for securing one end of the linkage thus formed to the window sill, and supporting means at the other end of

the linkage, said supporting means being self-gripping when brought into engagement with said guide strips, said ventilator being confined within the runway for the outer sash and substantially of the same length as the width of said sash, said sashes being free to move in said runways to substantially the same extent when the ventilator is collapsed on said sill as if said ventilator were not mounted in said casing.

3. A device of the character described, comprising a plurality of slats stamped from sheet material and each having a pair of tongue members integrally formed upon the ends thereof, links provided with oppositively disposed reversely positioned socket members adapted to receive said tongue members, and means for holding said sockets in engagement with said tongue members.

4. In combination, a window casing having upper and lower sashes, runways for said sashes and guide strips separating said runways, a collapsible ventilator mounted within the runway of the upper sash and fastened, when collapsed, only to the sill of said casing, and means comprising an upper slat with bifurcated ends rendered effective by the weight of the ventilator for gripping said guide strips to hold said ventilator extended.

5. A collapsible ventilator for a window comprising a casing, upper and lower sashes freely movable up and down in runways in said casing, guide strips separating said runways and a window sill, said ventilator comprising a plurality of slats loosely hinged together with the ends thereof extending into the runways of the upper sash, means fastening the bottom slat to the window sill, said sashes being free to move in said runways to substantially the same extent when said ventilator is collapsed on said sill as if said ventilator were not mounted thereon, one edge of the top slat of the ventilator being closely hinged to the rear edge of the next slat, the free edge of the top slat being shorter in length than the hinged edge so that the top slat may be turned back between the guide strips and underneath the bottom of the lower sash, and means at the ends of the top slat for gripping the guide strips immediately below the bottom of the lower sash to hold said ventilator in operating position.

6. In combination, a window casing having upper and lower sashes and a runway for said sashes, guide strips separating said runways, a collapsible ventilator mounted within the runway of the upper sash and fastened, when collapsed, only on the sill of the casing, said ventilator comprising a plurality of slats loosely hinged together and adapted to incline outwardly and downwardly when in operating position, the top slat being provided with gripping means adapted to engage the inner and outer sides of said guide strips, said gripping means constituting slide membrs reciprocably mounted on the ends of the top slat, said ventilator being hingedly connected to an edge of said top slat, whereby the weight of the ventilator when in operative position effects engagement of said gripping means with said guide strips.

7. In combination, a window casing having upper and lower sashes and runways for said sashes, guide strips separating said runways, a collapsible ventilator mounted within the runway of the upper sash and fastened, when collapsed, only on the sill of the casing, both of said sashes being free to move in their runways to substantially the same extent as if no ventilator was so mounted, means carried by an upper slat for gripping the inner and outer sides of said guide strips, said ventilator being hingedly connected to an edge of said upper slat, whereby the weight of the ventilator when in operative position effects engagement of said gripping means with said guide strips.

HENRY HOVLAND.