Dec. 28, 1943. B. D. WINSER 2,337,632

VENTILATOR OR WINDOW, OR SIMILAR CLOSURE

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FIG. 1.

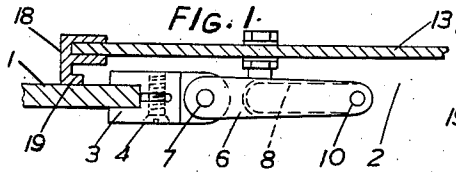


FIG. 2.

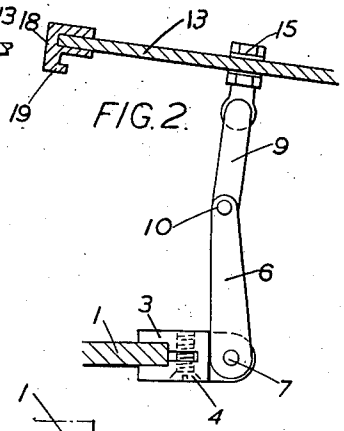


FIG. 1A.

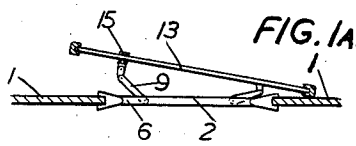


FIG. 1B.

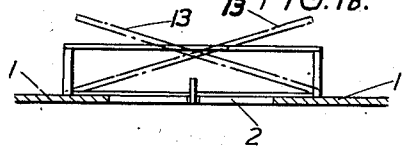


FIG. 1c.

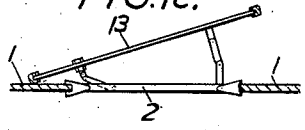


FIG. 3.

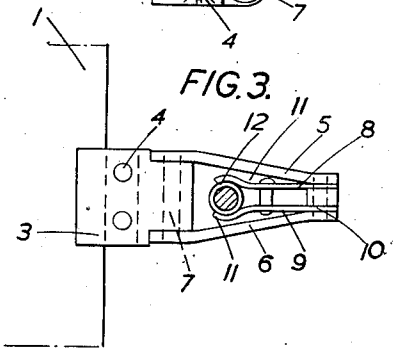


FIG. 4.

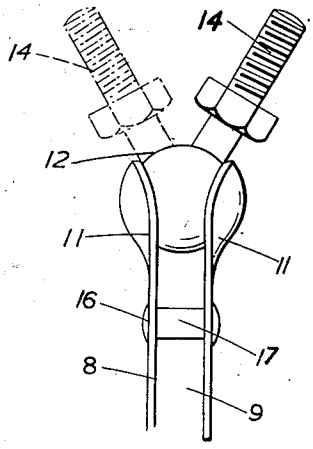


FIG. 4B.

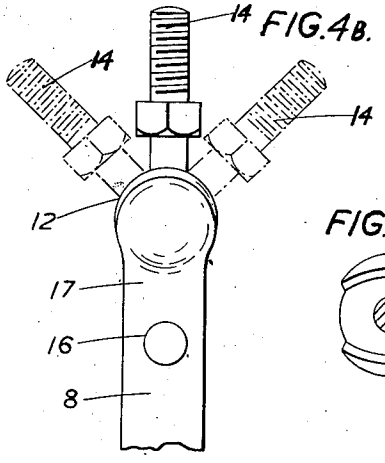
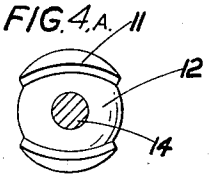


FIG. 4A.



INVENTOR:

Bernard Douglas Winser

BY

Williams, Bradbury & Hinkle

ATTORNEYS.

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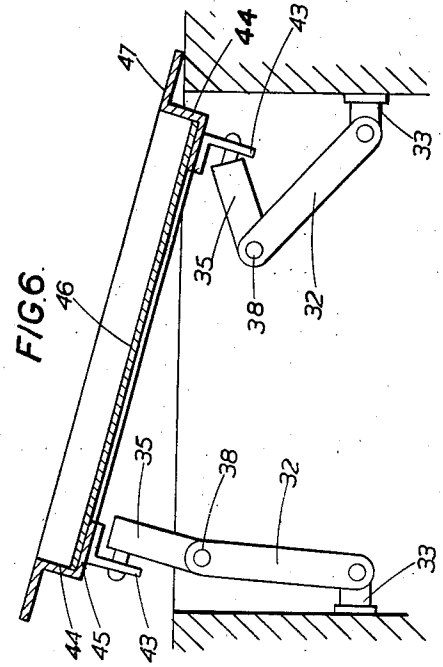


FIG. 6.

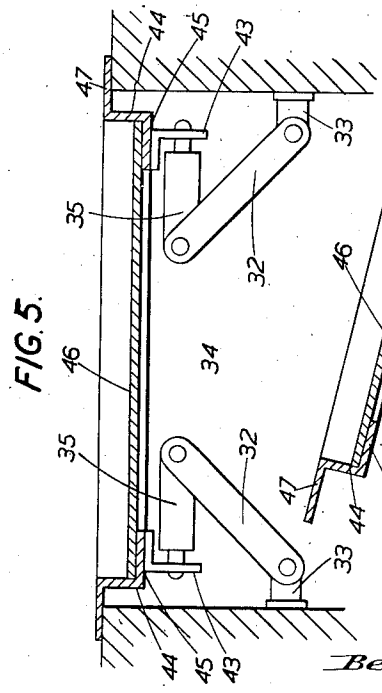


FIG. 5.

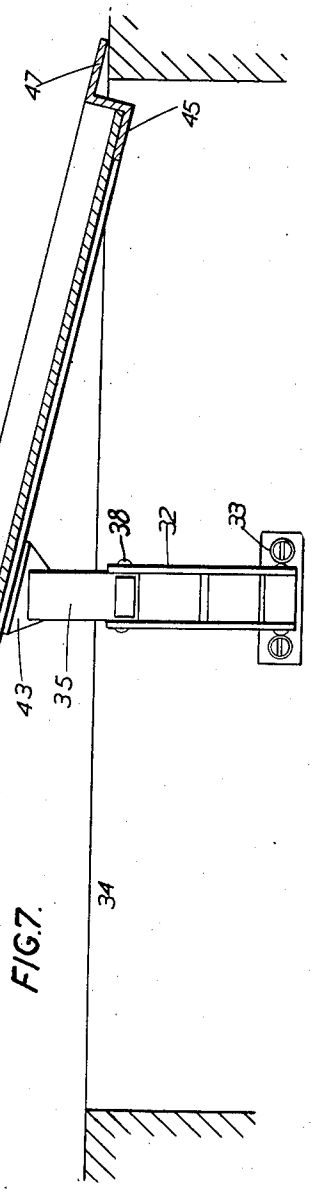


FIG. 7.

INVENTOR:

Bernard Douglas Winser

BY

Williams, Bradbury & Hinkle

ATTORNEYS.

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FIG. 8.

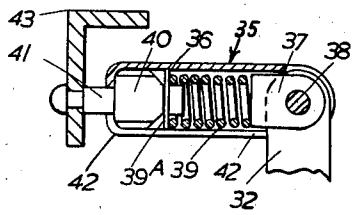


FIG. 9.

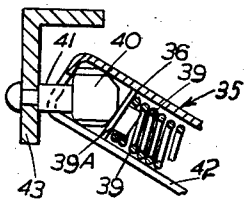


FIG. 10.

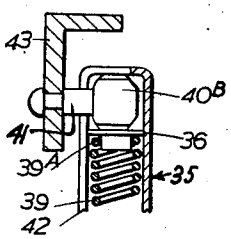


FIG. 11.

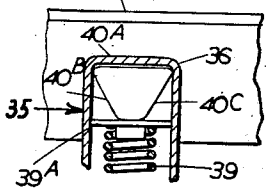


FIG. 12.

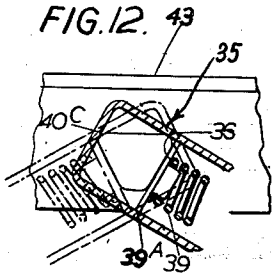
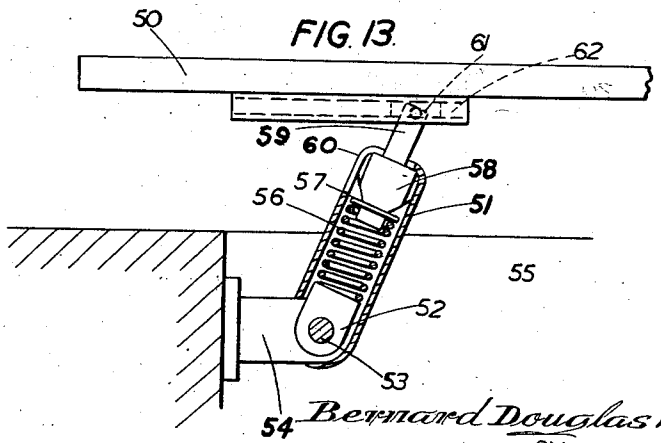


FIG. 13.



INVENTOR:
Bernard Douglas Winser
BY
Williams, Bradbury & Hinkle
ATTORNEYS

Patented Dec. 28, 1943

2,337,632

UNITED STATES PATENT OFFICE

2,337,632

VENTILATOR OR WINDOW, OR SIMILAR CLOSURE

Bernard Douglas Winser, Brentford, England

Application August 8, 1942, Serial No. 454,130
In Great Britain February 17, 1941

15 Claims. (Cl. 98—8)

This invention relates to ventilators or windows for rooms, vehicles, aircraft, ships' cabins and the like.

The invention is particularly applicable to ventilators adapted to be fitted to windows, roof-lights, ships' scuttles or equivalent, and it can also be applied to the mounting of shields or visors on tanks or other vehicles used in warfare. For simplicity of description, however, all such ventilators, windows, shields, etc., will be referred to in the accompanying claims as "closure members" or "closures," while the closure members and their supporting mechanisms will be referred to as "ventilating devices."

Windows are frequently provided with glass closures, which can be hinged about one edge so as to control the flow of air into and from the room. Similarly, the roof-lights of caravans or other vehicles are frequently hinged about one edge for the same purpose. Such an arrangement has the disadvantage that the opening afforded by the opened closure always faces in one direction, so that while the closure or roof-light may be set correctly when the wind is blowing from one quarter, there may be far too much draught in the room or equivalent, or too little air entering, if the direction of the wind changes. Thus, it is obviously advantageous to be able to present the opening afforded by the ventilating device to the direction from which the wind is blowing, or to shield the opening in that direction, as the case may be.

One object of the present invention is to provide a ventilating device for controlling air flow through an aperture wherein the closure member is supported at each of two opposite sides by a fixed supporting member arranged in or adjacent to the aperture, and by movable mechanism including a mounting on the closure, a link for connecting the said supporting member to the said mounting, joint means for connecting the link to the supporting member and other joint means for connecting the link to the mounting, at least one of the joint means being a universal joint.

In any construction, the ventilating device comprises a closure, a fixed supporting member at each of two opposite sides of the closure arranged in or adjacent to the aperture, and movable mechanism which connects the closure to the supporting member or members and which includes at least one universal joint means.

The above expression "fixed supporting member" is used to denote that the support is fixed at such times as the closure is being adjusted. Obviously, such supports may themselves be adjustable but adapted to be fixed in position after adjustment.

Many applications of the invention are possible. One particularly advantageous application is to the roof-light of a caravan, the usual roof-light being hinged at one edge only and thus quite unsuited to provide proper ventilation and to prevent unwanted draughts, on account of changes in the wind direction. Other advantageous applications are to the windows or roof-lights of motor cars and to the ventilation of rooms having windows which face on to a passage or entry, such as that between two closely adjacent houses.

Several constructional forms of the invention, all applied to ventilating devices, will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a view, partly in section, of part of a roof-light, and shows one set of the two sets of links used for supporting the closure, the links being collapsed and the ventilating device in closed condition;

Figs. 1A, 1B, and 1C show diagrammatically the closure in various adjusted positions;

Fig. 2 is a view corresponding to Fig. 1, but showing the links in an expanded position and the ventilating device open;

Fig. 3 is a plan view corresponding to Fig. 1;

Figs. 4 to 4B are views to an enlarged scale of the ball and socket joint connecting the closure to the outer supporting link, the ball part being shown in a number of positions corresponding to different settings of the closure;

Fig. 5 is an end view, partly in section, of another construction comprising resilient means for locking the closure in a number of adjusted positions, the ventilating device being shown in the closed condition;

Fig. 6 is a view corresponding to Fig. 5, but showing the ventilating device in an open condition with one of the longer edges of the closure bearing upon the bordering edge of the aperture;

Fig. 7 is a longitudinal elevation of the ventilating device shown in Figs. 5 and 6, but being shown in an open condition with one of the shorter edges of the closure bearing upon the bordering edge of the aperture;

Figs. 8 to 12, are fragmentary, enlarged sectional views of the outer link of one of the sets of supporting links showing the various positions of the link from the closed position of Fig. 8, corresponding to the closed condition shown in Fig. 5, to the open position of Fig. 12 corre-

sponding to the open condition shown in Fig. 7. Figs. 8 to 10 are part sections of the outer link and Figs. 11 and 12 are sectional end views, and Fig. 13 is a view partly in section, of part of a ventilating device, and shows one link of a modification in which the closure is supported at each of two opposite sides by a single link having a universal and slidable connection with the closure.

In the following description, the expression "inner links" means those links which are nearest to the walls of the opening, and "outer links" means those links which are nearest to the ventilator.

One embodiment of the invention, as applied to a roof-light of a vehicle, is constructed as follows. Referring to Figs. 1 to 3, the glass-roof-light 1, which is hinged along one edge in the usual manner, is formed with a central rectangular opening 2. Midway of each of the longer edges of the opening a bracket 3 is fixed to the roof-light, the two brackets being diametrically opposite to each other. Each bracket is recessed to form two jaws between which the edge of the roof-light bordering the opening is embraced, the bracket being fixed by two screws 4 pulling the two jaws towards each other. On opposite sides of the bracket two inner links 5 and 6 are pivoted at their inner ends on a pin 7 fixed in the bracket, the inner ends of two outer links 8 and 9 being pivoted between the outer ends of the inner links on a pin 10 extending between the latter. The outer ends of the two links 8 and 9 are of bulbous shape as shown more clearly in Figs. 4 to 4B, so as to form between them the socket portion 11 of a ball and socket joint adapted to embrace the ball part of the said joint. The balls 12 are arranged on the inside of a rectangular pane of glass 13 which forms the closure. Each ball is integral with a shank 14 which is passed through a hole in the closure and projects beyond the external surface of the latter, where it is screw-threaded and provided with a nut 15 screwed down upon a washer to prevent displacement of the closure. Disengagement of the ball 12 from the socket formed between the bulbous parts 11 is prevented by rivets 16 preventing lateral separation of the levers 8 and 9 and passing through tubular distance pieces 17.

Thus, at each of two diametrically opposite sides of the opening 2 there is an assembly of a bracket 3, inner links 5, 6 and outer links 8, 9, and ball and socket joints 11, 12 as described above. Completely surrounding the closure there is a rubber sealing member 18, which is recessed to receive the peripheral edge of the closure and is also formed with a flange 19 which, or part of which, can be pressed closely into contact with the exterior of the roof-light to form a weather-proof seal therewith as shown in Figs. 1 to 1C, for example.

It will thus be understood that the closure can be adjusted and orientated in many directions so as to prevent the entry of air, or to admit air, to the interior of the vehicle from different quarters. By suitably extending or collapsing one or the other or both sets of links 5, 6 and 8, 9 and by swivelling the closure by means of the ball joints 11, 12, it can be set to face any desired direction and at any desired inclination. The closure is shown diagrammatically in various adjusted positions in Fig. 1A to Fig. 1C by way of illustration, but it will be understood that it can be made to occupy many other positions by virtue of the pivotal and universal joints provided between the roof-light and the closure, and with a longer or shorter edge pressed into contact with the roof-light or with all its edges spaced from the latter.

Means, including wing nuts, for example, may be provided for locking the links 5, 6 and 8, 9 in their collapsed and extended positions and (or) for locking the swivel joints 11, 12, so as to fix the closure in its adjusted positions. Each set of links may include more than two links and any of the pivotal joints could be replaced by universal joints.

In the modified construction shown in Figs. 5 to 12, the inner ends of the inner links 32 are pivotally carried by diametrically opposed brackets 33 fixed to the wall or frame surrounding an opening 34, the inner ends of outer links 35 being pivotally connected to the outer ends of the links 32. Each link 35 comprises a tubular socket 36 of any convenient section, see Figs. 8 to 12, fixed to a part 37, which is pivotally carried on a pin 38 extending transversely across the two spaced parts of the link 32. A spring 39 is arranged in each socket part 36, with its inner end bearing against the part 37 and its outer end against a pad 39A interposed between the spring and a ball-like member 40 having a stem 41 which projects through an elongated slot 42 formed in the outer end of the socket and extending lengthwise of the socket, the stem being connected to an angle bracket 43. The two angle brackets 43 are fixed at diametrically opposite positions to a frame 44 of Z-section, the inner flange 45 of which carries a glass closure or window 46, while the outer flange 47 is adapted to form a seal with the outside of the walls or frame (Fig. 5) or any one of the walls or sides of the frame (Figs. 6 and 7) surrounding the opening 34.

As shown in Figs. 8 to 12, the ball member 40 is formed with three flats 40A, 40B and 40C between its inner and outer ends, the section of the member between the ends thus being triangular. Fig. 8 shows the position of one of the sockets 36 when the closure or window is closed, and it will be seen that the closure is locked in that position by virtue of the ball member 40 being squeezed by the spring 39 between the outer wall of the socket and the pad 39A. Fig. 9 shows how when the socket 36 has been raised, for example, to the position shown on the right of Fig. 6, the stem 41 has moved downwards in the slot 42, the ball member being inclined across the interior of the socket and being held in that position by the pressure of the spring exerted on the ball through the pad 39A. In Fig. 10 and Fig. 11, the socket 36 is shown adjusted into a vertical position, in which the stem 41 projects through that part of the slot 42 which is parallel to the axis of the socket and is therefore at right angles to said axis, while the pad 39A is held against the apex of the sides 40B and 40C. Fig. 12 shows in full lines the bracket 43 and socket 36 brought into such relative positions that the pad 39A bears against the flat 40C. By such an arrangement, the closure can be resiliently locked in a number of adjusted positions.

In the modified construction shown in Fig. 13, the closure 50 is supported at each of two opposite sides by a single link only, which is similar in construction to the outer link 35 shown in Figs. 5 to 12. The link comprises a tubular socket 51 fixed to a part 52 which is pivotally mounted on a pin 53 fixed in a bracket 54 attached to the

wall bordering the aperture 55. A spring 56 bears at its inner end against the part 37 and at its outer end against a pad 57 interposed between the spring and a ball-like member 58 provided with as many flats as may be desired for locking purposes. The member 58 has a stem 59 which extends through a slot 60 in the socket and which at its outer end is pivotally connected to a member 61 slidably arranged in a guide 62 fixed to the underside of the closure. The slot 60 is, of course, sufficiently wide to permit the required inclination of the closure in a plane at right angles to the plane of the figure.

The closure shown in the drawings is rectangular. It will be appreciated, however, that it may be any other shape, such as square, elliptical, circular and so on. Further, although the invention has been described above with specific reference to closures for ventilating devices, its application to windows, shields, plates and frames and other equivalents of closure members will be readily understandable by those skilled in the art.

It will be understood that the ball member 40 can be provided with more or less than three flats, thus enabling the closure to be locked in a greater or less number of positions.

An obvious mechanical equivalent of the flats on the ball-like member 40 (Figs. 8 to 12) or 58 (Fig. 13) and the spring-pressed pad 39A (Figs. 8 to 12) or 57 (Fig. 13) consists in providing a plurality of spaced recesses in the ball-like member adapted to be engaged by a pipe or projection on the pad.

I claim:

1. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said means comprising two pairs of links, the links of each pair being pivotally connected, one to the other, each pair of links being pivotally connected to said closure at one of their ends adjacent opposite sides of said closure and adapted to be pivotally supported adjacent their other ends on axes fixed relative to said opening, whereby said opposite sides of said closure may be independently adjusted relative to the margins of the opening, at least one of said pivotal connections of each pair of links being a universal joint, to permit transverse swinging of said closure.

2. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said means comprising two pairs of links, means pivotally connecting one end of each link of each pair to one end of the other link of that pair, means pivotally connecting one end of each pair of links to the closure, and means pivotally connecting the other end of each pair of links to the wall of the opening, at least one of said connecting means being a universal joint.

3. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said means comprising two sets of links, means pivotally connecting the adjacent ends of adjoining links in each set, means pivotally connecting one end of each set of links to said closure, and means pivotally connecting the other end of each set of links to the wall of the opening, at least one of said connecting means being a universal joint.

4. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening, a pair of supporting members mounted on the opening defining means, one on each of two opposite sides thereof, a pair of mountings on said closure, two sets of pivotally connected links, means pivotally connecting each of said sets of links to its associated supporting member on said opening defining means, and second means pivotally connecting each of said sets of links to its associated mounting on said closure, at least one of said connecting means being a universal joint, whereby said closure may be given a universal type movement and may be adjusted in a plurality of positions relative to the opening.

5. A ventilating device for controlling the flow of air through an opening, comprising a closure having an edge portion adapted to overlie each edge of the opening, a sealing member positioned around the periphery of said edge portion, and means for adjustably supporting said closure in a plurality of positions, said means comprising two sets of links, means pivotally connecting the adjacent ends of adjoining links in each set, means pivotally connecting one end of each set of links to said closure, and means pivotally connecting the other end of each set of links to the opening defining means, at least one of said connecting means being a universal joint.

6. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said means including a supporting member mounted on the opening defining means, a mounting on said closure, a plurality of pivotally connected links, means pivotally connecting one of said links to said supporting member, and means pivotally connecting another of said links to said mounting, at least one of said connecting means being a universal joint.

7. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means adjustably supporting said closure in a plurality of positions, said supporting means including a pair of support members mounted on the opening defining member, a pair of mountings on said closure, two sets of pivotally connected links, means pivotally connecting the innermost link in each set to one of said pair of support members, and means pivotally connecting the outermost link in each set to one of said pair of mountings on said closure, at least one of said connecting means being a universal joint.

8. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said supporting means including a support member mounted on the opening defining member, a mounting on said closure, link means, means pivotally connecting said link means to said supporting member, and universal type joint means pivotally connecting said link means to said mounting, said last-mentioned means including a member slidably associated with said mounting.

9. A ventilating device for controlling the flow of air through an opening, comprising a closure for said opening, a pair of brackets mounted on the opening defining means, one at each of two opposite sides of the opening, an inner link piv-

otally connected to each of said brackets, an outer link pivotally connected to each inner link, a housing formed at the outer end of each outer link, a ball member mounted in each of said housings, and means for attaching each ball member to said closure, each of said last-mentioned means being positioned on opposite sides of said closure.

10. A ventilating device for controlling the flow of air through an opening, comprising a closure for said opening, a pair of brackets mounted on the opening defining means, one at each of two opposite sides thereof, an inner link pivotally connected to each of said brackets, an outer link pivotally connected to each inner link, a housing formed at the outer end of each outer link, a ball member mounted in each of said housings, means for locking each of said ball members in its associated housing in any of a plurality of positions, and means attaching said ball member to said closure, each of said last-mentioned means being positioned on opposite sides of said closure.

11. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening and means for adjustably supporting said closure in a plurality of positions, said supporting means including a support member mounted on an opening defining member, a mounting on said closure, pivotally connected link means, a socket in one end of said link means, means pivotally connecting said link means to said support member, and a universal joint means pivotally connecting said link means to said mounting, said universal joint means having a substantially spherical member positioned in said socket, a plurality of flats on said substantially spherical member, means in said socket adapted to cooperate with said flats to lock said spherical member in any of a plurality of positions, and means urging said last-mentioned means into engagement with said flats.

12. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening, a pair of brackets mounted on the opening defining means, one on each of two opposite sides thereof, an inner link pivotally connected to each of said brackets, an outer link pivotally connected to each inner link, a housing at the outer end of each outer link, a ball member having an extension mounted in each of said housings, means for resiliently locking each of said ball members in its associated housing in any of a plurality of positions, said locking means including spring pressed means adapted to cooperate with any of said plurality of flats, and means attaching the extension on each ball member to said closure, each of said last-mentioned means being positioned on opposite sides of said closure.

13. A ventilating device for controlling the flow of air through an opening, comprising a closure for the opening, a pair of brackets mounted on the opening defining means, one on each of two opposite sides thereof, a pair of mounting members slidably mounted on said closure, a pair of links, means pivotally connecting each of said links to one of said brackets, and second means pivotally connecting each of said links to one of said mounting members, at least one of said connecting means being a universal joint, whereby said closure may be given a universal type movement and may be adjusted in a plurality of positions.

14. A ventilating device for controlling the flow of air through an opening, a closure for the opening, a pair of brackets mounted on the opening defining means, one on each of two opposite sides thereof, a pair of mounting members slidably mounted on said closure, a pair of links, means pivotally connecting each of said links to one of said brackets, and universal joint means pivotally connecting each of said links to one of said mounting members, whereby said closure may be given a universal type movement and may be adjusted in a plurality of positions.

15. A ventilating device for controlling the flow of air through an opening, comprising a closure for said opening, a pair of brackets mounted on the opening defining means, one on each of two opposite sides thereof, a pair of mounting members slidably mounted on said closure, a pair of links, means pivotally connecting each of said links to one of said brackets, and means pivotally connecting each of said links to one of said mounting members, said second connecting means including means forming a socket in the end of said link, a ball member mounted in said sockets, and means for locking said ball members in a plurality of positions.

BERNARD DOUGLAS WINSER.