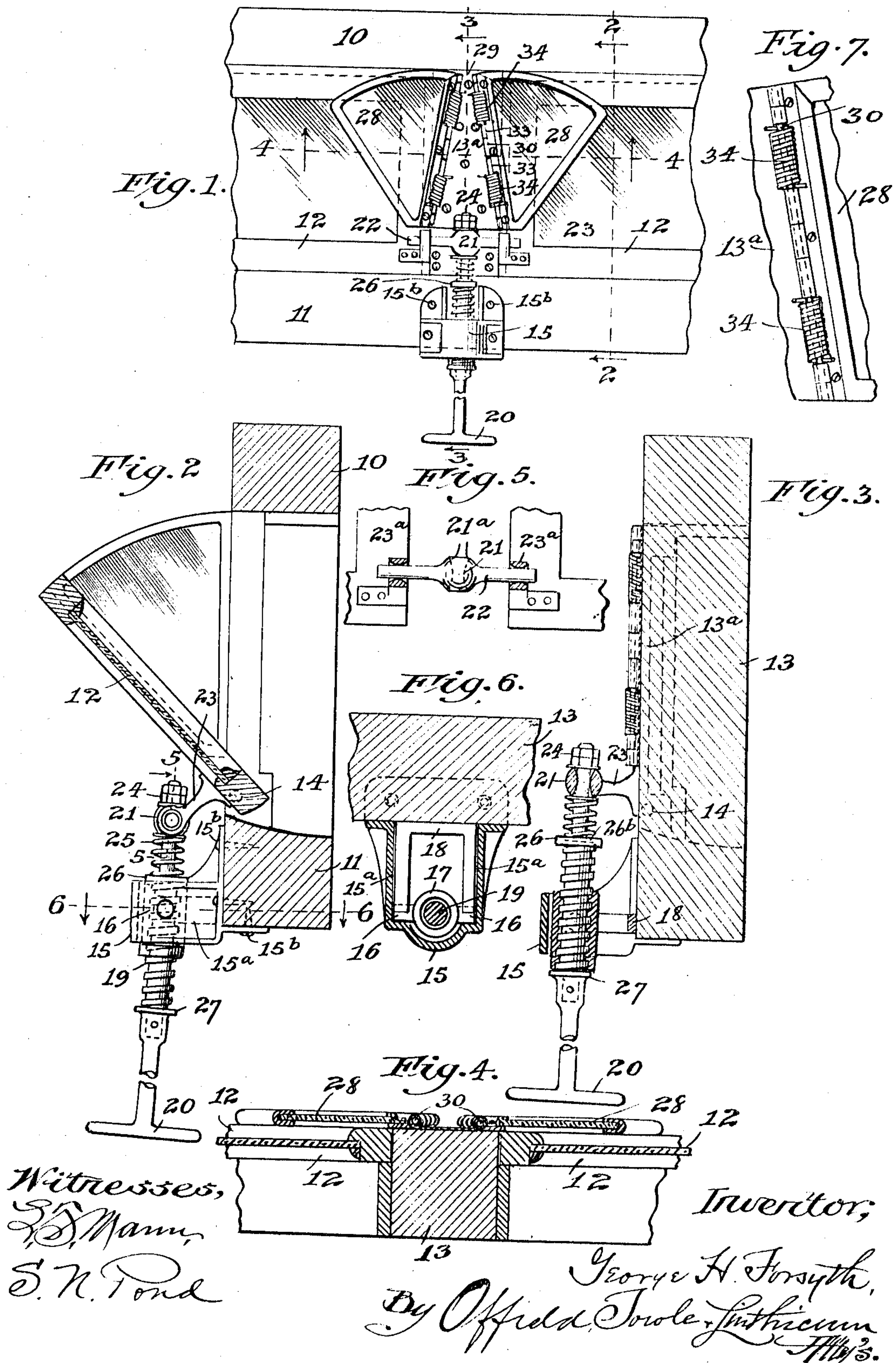


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VENTILATOR.

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To all whom it may concern.

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ventilators, of which the following is a specification.

This invention relates to ventilators, having reference more particularly to car ventilators of that type wherein the deck sash is pivoted horizontally at its lower corners and is adapted to swing inwardly of the car in its opening movement. A serious objection to ventilators of this type resides in the fact that ready access is thereby permitted for rain, snow, sleet and drafts through the ends of the ventilators when open; also, in cold weather, it is practically impossible to properly ventilate the car without involving the loss of much heat that is swept out of the car by the incoming drafts, to say nothing of the discomfort imposed upon passengers thereby.

My present invention has for its principal object to provide a simple, inexpensive, reliable and easily manipulated closure device for the end openings of the ventilator, so as to limit the space or passageway for the circulation of air between the inside and outside of the car to the opening formed between the upper edges of the sash when the latter is open and the upper edge of the sash frame or casing.

To this end my invention consists substantially, as to this feature, in the combination with a movable ventilator sash, of a device adapted to close the end opening between the sash and its frame when the sash is open, which closure device is automatically moved to operative position when the sash is opened, and effects the closure of said opening whether the sash be fully or but partially opened. In the preferred form of the invention herein shown and described, this closure takes the form of a pivoted and foldable shutter of substantially triangular form corresponding to the outline form of the opening designed to be covered thereby, which shutter, when in closed position, overlaps the end of the sash, and is opened out into a plane approximately at right angles to the plane of the sash when the latter is fully opened.

Another feature of my invention resides in a new and improved actuating device

adapted to simultaneously open and close two adjacent sashes and to effect a tight closing of both irrespective of slight variations in the planes of the sash openings, which device also holds the sash against jarring loose from its snug fit in its casing.

My invention will be readily understood when considered in connection with the accompanying drawings which illustrate one practical mechanical form in which the same may be embodied, and in which,—

Figure 1 is a front elevational view, from the inside of a car, of the adjacent ends of two deck sash ventilators, showing a pair of my improved shutters applied thereto with my improved operating means therefor. Fig. 2 is a cross-sectional view on a somewhat enlarged scale on the line 2—2 of Fig. 1, viewed in the direction indicated by the arrows, and showing the sash and end shutter in open position. Fig. 3 is a cross-sectional view on line 3—3 of Fig. 1, viewed in the direction indicated by the arrows. Fig. 4 is a horizontal section on the line 4—4 of Fig. 1, viewed in the direction indicated by the arrows. Fig. 5 is a detail cross-section on the line 5—5 of Fig. 2, with the shutter-operating rod and its cushioning spring omitted for the sake of clearness. Fig. 6 is a detail cross-sectional view on the line 6—6 of Fig. 2, looking downwardly. Fig. 7 is a detail of the shutter hinge.

Referring to the drawings, 10 and 11 designate the upper and lower portions of the car-deck structure, between which are located the deck sashes 12 suitably spaced by intervening upright posts or frame-members 13, the members 10, 11 and 13 unitedly constituting the jambs or casings of the sashes 12, which latter are pivotally mounted in and between the partition posts or uprights 13 on horizontal hinge-pintles 14 located at the lower corners of each sash, thus leaving the sash free to swing at its upper end inwardly and outwardly of the opening closed thereby.

The means for opening and closing the sash as herein shown consists of the following mechanism: 15 designates a U-shaped bracket member, that is strongly secured by screws 15^b to the lower and inner sides of the member 11, projecting inwardly from the latter. The two parallel side arms of the bracket 15 are longitudinally grooved, as shown at 15^a, to receive the trunnions 16 of

an internally threaded sleeve or nut 17, the trunnions 16 being confined in proper position by a cooperating U-shaped member 18 interposed between the bracket 15 and the inner wall of the frame-member 11, with the parallel side arms of the member 18 lying in the slots 15^a, and their inner ends concaved to form half-bearings for the trunnions, as clearly shown in Fig. 6. The nut 17 is engaged by a threaded rod 19, to the lower end of which is secured a suitable handle 20 for operating the same, while its upper end portion is reduced in diameter and is extended through an opening 21^a in a central hub 21 formed on an equalizer-bar 22, the ends of which latter are rotatably mounted in bearings 23^a (Fig. 5) formed in the outer ends of bracket arms 23 secured to the lower adjacent corners of two adjacent sash frames 12. The upper projecting end of the threaded rod 19 above its bearing in the equalizer-bar 22 is secured by suitable nuts 24; while a coiled compression spring 25 is interposed between the hub 21 of equalizer-bar 22 and a stop 26 on the rod 19 formed at the base of its reduced upper portion. It will be observed by reference to Fig. 5 that the walls of the bearings 21^a and 23^a accommodating the rod 19 and equalizer-bar 22, respectively, are rounded or convexed so as to provide loose bearings permitting a limited universal angular movement between said members and their respective bearings for purposes which will hereinafter appear. The threaded portion of the rod 19 may further be provided with a stop 27 at its lower end, said stop being conveniently formed on the upper end of the stem of the handle 20 in which the lower end of said threaded rod 19 is secured.

From the foregoing it will be seen that by turning the handle 20 in a direction to screw the rod 19 upwardly, the two sash-members 12 will be swung on their pivots to closed position; and it will be further observed that in case they do not close simultaneously or under equal extents of movement, the bearing 23^a of that sash which closes first will act as a fulcrum whereby, through a slight continued movement of the rod 19, the equalizer-bar 22 will rock to force the other sash to a close fit in its casing, thus insuring the complete and effective closing of both sash-members by a single common operating device, irrespective of variations in the extent of travel required to effect such closing.

Referring now to the feature of the end closure, in which my present invention principally resides, 28 designates as an entirety a triangular-shaped shutter, preferably of glass, mounted in a sheet-metal frame or holder, a pair of which shutters, having somewhat the form and appearance of the wings of a butterfly, are pivotally mounted on the inner face of the upright partition

post 13, or on a metal face-plate 13^a secured thereon. As the manner and means of mounting of each of these shutters are duplicates, a description of one will suffice for both. On the face of the plate 13^a are secured fixed upper, central and lower hinge-members 29 in which is journaled a hinge-pintle 30; and integral with or secured to the adjacent frame-member of the shutter are a series of hinge-members 33 embracing said spindle. Between adjacent hinge-members 33 and surrounding the spindle are torsion springs 34, the ends of which bear respectively upon the faces of the plate 13^a and the outer face of the frame of the shutter, so that the normal torsional effect of these springs is to maintain the shutter folded over the end of the sash.

It will be observed that the shutters are hinged on axes disposed obliquely or at an acute angle to the vertical edge of the sash-casing forming one end of the sash opening. By reason of this arrangement, the edge end of the sash lies in contact throughout its full extent with the inner face of the shutter throughout the entire opening movement of the sash and shutter, or at all open positions of the sash, which would not be the case were the shutter hinged on a line parallel with the vertical edge of the sash-casing. When the sash is opened, the shutter is maintained in open position against the closing effect of the springs 34 by the abutment of the sash against the free end edge of the shutter, as clearly shown in Fig. 2.

The spring 25 exerts a constant tension holding both sashes closed except when the latter are opened, and by its back pressure on the screw prevents accidental back turning of the latter under the jars and vibration to which the car is subjected in travel. The upper stop 26 limits the extent of opening movement of the sash through engagement with the upper end of the bracket 15; and the lower stop 27 prevents possible breakage or other injury to the sash-actuating arms 23 and also limits the extent of compression of spring 25, preventing the latter from being compressed solid.

While the described manner of hinging the shutters on lines inclined or oblique to the vertical edges of the sash-casing is preferred for the reasons stated, yet this feature is not essential to the carrying out of the invention and the attainment of the result secured thereby.

I am aware that other variations and modifications in the structural details of the device might be made without departing from the substance of the invention, and hence I do not limit the invention to the particular mechanism disclosed, except to the extent indicated in specific claims.

I claim:

1. The combination with a movable sash, 130

of a movable shutter adapted, when the sash is open, to close the opening between an edge of the sash and the sash casing.

2. The combination with a movable sash, of a pivoted shutter adapted, when the sash is open, to close the opening between an edge of the sash and the sash casing.

3. The combination with a movable sash, of a pivoted shutter adapted, when the sash is open, to close the opening between an edge of the sash and the sash casing, and, when closed, to fold over said edge of the sash.

4. The combination with a sash having an edge movable toward and from the sash casing, of a shutter movable with the sash and serving to close the opening between said movable edge of the sash and the casing.

5. The combination with a sash having an edge movable toward and from the sash casing, of a shutter adapted to be operated by the sash in the opening movement and when so operated closing the opening between said movable edge of the sash and the casing.

6. The combination with a pivoted sash, of a shutter, movable with the sash and serving to close the opening between an edge of the sash and the sash casing.

7. The combination with a swinging sash, of a shutter pivoted at an angle to one of the edges of the sash casing and adapted to be engaged by a free edge of the sash during the opening movement of the latter.

8. The combination with a swinging sash, of a shutter pivoted at an angle to one of the edges of the sash casing and adapted to be continuously engaged by one of the angularly movable edges of the sash during the opening movement of the latter, said edge of the sash engaging the shutter throughout its full extent in all open positions of the sash.

9. The combination with a plurality of movable sashes, of sash-actuating means common to said sashes and operating to fully close all of said sashes irrespective of variations in the fit of the latter or the extent of closing movement required.

10. The combination with a plurality of movable sashes, of a sash-actuating device,

and an equalizer between said sashes whereby all of the latter are fully closed when said actuating device is operating to effect the closing movement of the sashes.

11. The combination with a plurality of movable sashes, of a sash-actuating device, and an elastic equalizer between said sashes whereby all of the latter are fully closed under spring pressure when said actuating device is operated to effect the closing movement of the sashes.

12. The combination with a plurality of movable sashes, of an equalizer between said sashes, and a sash-actuating device operating through said equalizer to effect the complete closing of all of said sashes.

13. The combination with a plurality of movable sashes, of an equalizer-bar between and connected to said sashes, and a sash-actuating device including a spring operating through said equalizer-bar to effect the complete closing of all of said sashes.

14. The combination with a pair of movable sashes, of an equalizer-bar between and loosely connected at its ends to said sashes, and a sash-actuating device engaging said equalizer-bar between its ends.

15. The combination with a pair of movable sashes, of an equalizer-bar between and loosely connected at its ends to said sashes, a sash-actuating device operating on said equalizer-bar between its ends, and a spring through which said sash-operating device operates on said equalizer-bar during the closing movement of the sashes.

16. The combination with a pair of movable sashes, of an equalizer-bar between and loosely connected at its ends to said sashes, a screw-threaded rod loosely engaging said equalizer-bar between the ends of the latter, a threaded sleeve forming a bearing for said rod, means whereby said rod may be turned, and a spring through which the thrust of the rod is imparted to the equalizer-bar.

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