C. B. BREWER.

VENTILATOR.

APPLICATION FILED AUG. 10, 1910.

1,099,963.

Patented June 16, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

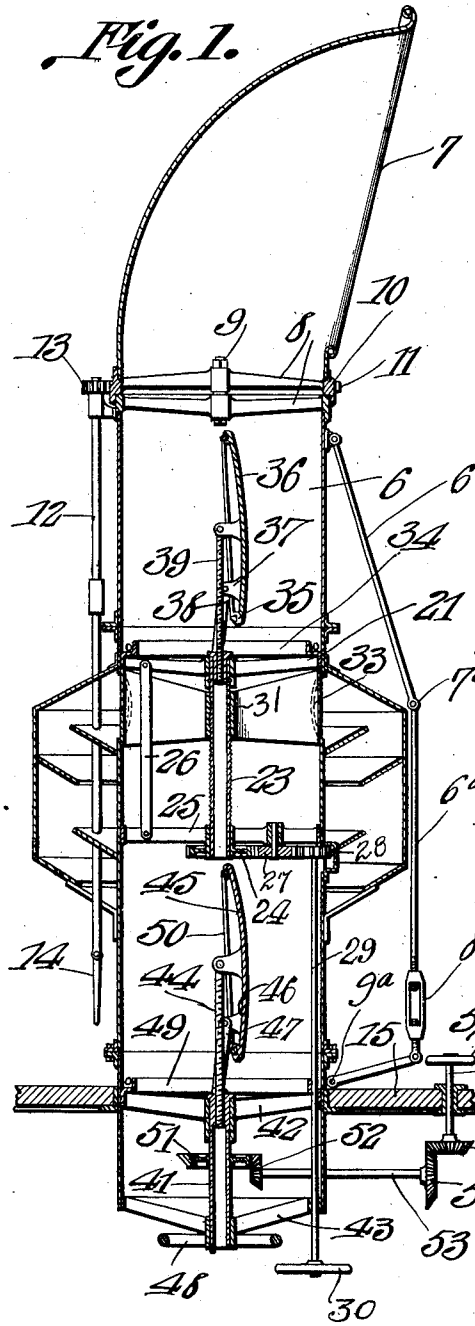
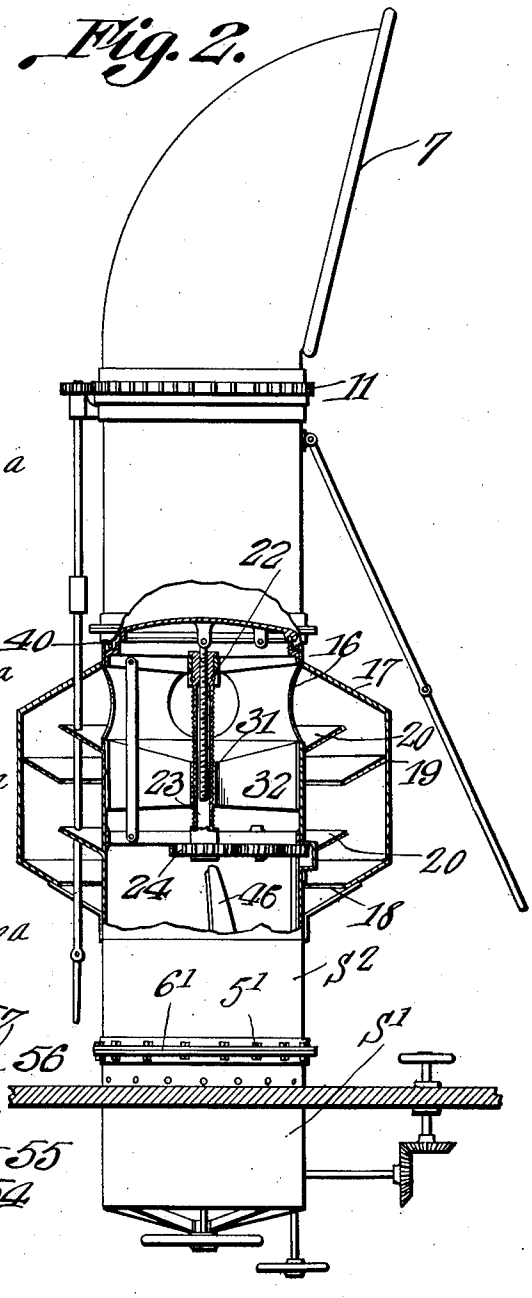


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

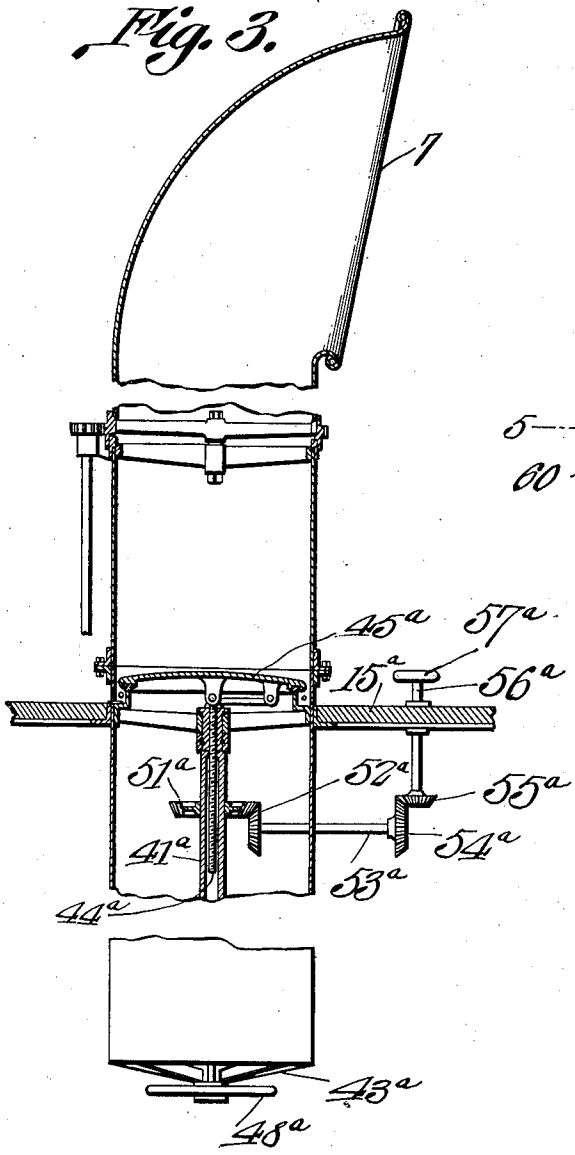
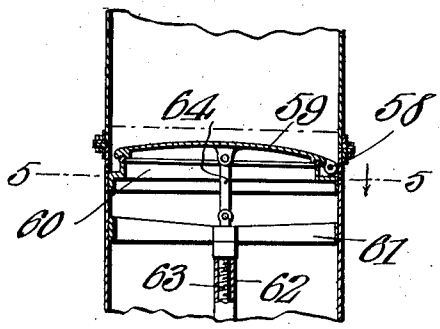


Fig. 4.



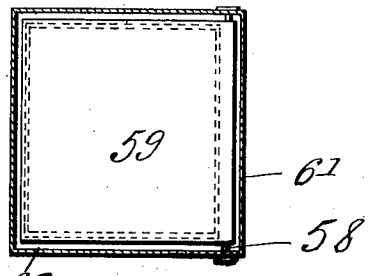


Fig. 5.

Witnesses

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VENTILATOR.

1,099,963. Specification of Letters Patent. Patented June 16, 1914.

Application filed August 10, 1910. Serial No. 576,454.

To all whom it may concern:

Be it known that I, CHARLES B. BREWER, a citizen of the United States, residing at Hyattsville, in the county of Prince Georges and State of Maryland, have invented a new and useful Ventilator, of which the following is a specification.

It is the object of the present invention to provide an improved construction of ventilator for ships.

One aim of the present invention is to provide for a more perfect control of draft through the ventilator stack than may be had in the instance of the ventilators of this type now in use. In this connection, the invention aims to provide a novel and highly efficient damper structure which is readily operable and may have its several elements adjusted to secure any desired draft through the stack.

It is a further aim of the invention to provide for an indirect draft as well as a direct draft so that in stormy weather, sufficient ventilation may be had without admitting through the ventilator stack, sudden gusts of wind.

A still further aim of the invention is to so construct and arrange the parts of the damper mechanism that in the event of a rain storm, water will be prevented from entering by way of the ventilator stack but on the other hand will be allowed to flow onto the deck of the ship.

With the above and other objects in view, the invention consists in the general construction and arrangement of parts shown in the accompanying drawings, in which,

Figure 1 is a vertical sectional view through a ventilator stack constructed in accordance with the present invention. Fig. 2 is a similar view but illustrating the damper mechanism so arranged and adjusted as to afford an indirect draft. Fig. 3 is a view similar to Fig. 1 illustrating a slight modification of the invention. Fig. 4 is a similar view illustrating a further modification. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 4.

In the drawings, the ventilator stack is indicated in general by the reference numeral 6 and in the instance of the present invention is taller than the ordinary ventilator and may be made of one or of several sections as may be found desirable.

The mouth of the ventilator stack 6 is indicated by the numeral 7 and the stack is provided interiorly at its upper end with a spider 8 as is the mouth 7 at its lower end, there being a swivel bolt 9 secured through the heads of the spiders whereby to connect the mouth of the stack with the body thereof so that the mouth may be swung around to any proper position with regard to the direction of travel or in which the wind is blowing. To properly hold the mouth 7 against displacement with respect to the body of the stack, the mouth is provided exteriorly at its lower end with a flange 10 formed with gear teeth 11 and this flange fits over the upper end of the said body of the stack. A shaft 12 is mounted for rotation upon one side of the body of the stack and at its upper end carries a pinion 13 in mesh with the teeth 11 of the flange 10 the shaft being provided at its lower end with a swiveled handle 14 which may be swung up to a substantially horizontal position and then swung back and forth to cause oscillation of the shaft 12 and a consequent rotation or turning of the mouth of the ventilator stack in the desired direction.

The numeral 15 indicates an ordinary ship deck through which is fitted the lower end of the ventilator stack 6. Above the deck, the stack 6 is formed with several comparatively large openings 16 which are here shown as four in number although a greater or less number may be provided. A drum 17 surrounds the stack 6 at a point at and below the openings 16 in the stack and this drum at its lower end is open or is spaced from the stack as at 18 for the admission of air to its interior and eventually through the openings 16 to the interior of the stack. Interiorly, the drum 17 is provided with a baffle 19 and this baffle projects between baffles 20 which are arranged exteriorly upon the stack 6, it being understood that air currents entering the lower end of the drum must circulate about these baffles prior to entering the stack through the opening 16. As will be presently explained, the entrance of air into the stack by way of the drum just described, is the means employed to provide an indirect draft when it is not desired to have the air current enter the mouth of the stack. The drum constitutes an air and wind-deflector or deflecting device.

A spider indicated by the numeral 21 is secured within the stack 6 directly above the openings 16 and in the head of this spider there is rotatably journaled, as at 22, the upper end of an interiorly threaded sleeve

shaft 23, this shaft having fixed upon it at its lower end a pinion 24. The said lower end of the threaded sleeve shaft is fitted in the head of a spider 25 located below the spider 21 and braced with respect thereto by tie bars 26, which prevents turning of a damper 36, presently to be described. Rotatably supported upon one arm of the spider 25 is a pinion 27 which is in mesh with the pinion 24 and in turn in mesh with the pinion 27 is one indicated by the numeral 28 carried at the upper end of a shaft 29. This shaft projects downwardly into the ventilator stack 6 and below the lower end thereof at which end it is provided with a hand wheel indicated by the numeral 30. By means of the hand wheel 30, the shaft 29 may be rotated so as to impart rotary movement to the sleeve shaft 23 as will be readily understood.

Fitted upon the sleeve shaft 23 is a hub indicated by the numeral 31 and having wings 32 radiating from it and supporting at their outer ends a short collar 33 which is of a diameter to fit snugly within the stack 6. This collar is of a height sufficient to completely close the openings 16 when the collar is in the position shown in Fig. 1 of the drawings although the openings are exposed when the collar is in the position shown in Fig. 2 of the drawings. It will now be understood that the shaft 29 is rotated in one direction to cause the sleeve shaft 23 to feed the collar upwardly and in an opposite direction to cause this latter shaft to feed the collar downwardly. As a consequence, the openings 16 may be exposed or entirely or only partly closed from a position beneath the deck 15.

The spider 21 is formed with an upstanding flange indicated by the numeral 34 and constituting a seat for a packing ring 35 seated in a groove in the under side of a damper plate 36. This damper plate is formed upon its under side with a pair of ears 37 and pivoted to each ear is a link 38, these links being pivotally connected at their lower ends to the head of the spider. A threaded shaft 39 is fitted through the upper end of the sleeve shaft 23 and when the said sleeve shaft 23 is so rotated as to elevate the collar 33, the rotation of the said shaft independently of the damper plate 36 will result in the shaft 39 moving upwardly from the sleeve shaft. This movement of the shaft 39 will cause the point of pivotal connection with the damper plate 36 to rise above the point of pivotal connection of the link 38 and the ears 37 and as a result, the damper plate will be initially given a bodily flatwise movement for a short distance and then tilted to the position shown in Fig. 1 of the drawings or substantially in that position. However, should the damper plate 36 be in the position shown in Fig. 1 of the drawings and it is desired to lower the plate to the position shown in Fig. 2 of the drawings in which latter position it will prevent the entrance of direct current of air through the mouth of the ventilator stack into the interior of the ship, the hand wheel 30 is rotated so as to turn the shaft 23 in an opposite direction whereupon the shaft 39 will be fed downwardly into the sleeve shaft and the damper-plate be thereby actuated so that it will, first, have a tilting movement and, finally, a bodily flatwise-movement whereupon the parts will assume the position stated. When the damper plate 36 is in closed position, it is of course seen that means must be provided for the escape of any water which may enter the mouth of the stack and for this purpose, the stack is formed with openings 40. These openings extend in a series around the stack in a horizontal plane with the flange 34 so that water falling upon the damper head will flow off through these openings and will drip off of the drum 17, the top wall of the drum being inclined. It will be understood at this point that when the hand wheel 30 is so manipulated as to open the damper plate 36 and allow a direct draft through the mouth of the stack to the interior of the vessel or to the space below the deck 15, the collar 33 is slid upwardly and closes the openings 16. On the other hand, when the damper plate 36 is adjusted to closed position, the collar 33 is lowered so as to expose the openings 16 and thereby provide for an indirect draft to the lower portion of the stack and into the interior of the vessel.

A sleeve shaft indicated by the numeral 41 is rotatably mounted in the heads of spiders 42 and 43 located one above the other in the order mentioned. Into the upper end of this sleeve shaft there is threaded a stem 44 pivoted at its upper end to a damper head 45. This damper head 45 is formed upon its under side with spaced ears 46 which are pivoted at the upper ends of links 47, these links being pivoted at their lower ends to the head of the spider 42. A hand wheel 48 is fixed upon the sleeve shaft at the lower end thereof and by rotating this hand wheel, the stem 44 will be threaded into or out of the sleeve shaft 41, in the former instance lowering the damper head 45 to closed position and in the latter instance elevating the head to the open position shown in Fig. 1 of the drawings. The spider 42 is formed with an upstanding flange 49 corresponding to the flange 34 heretofore described and affording a small packing ring 50 which is carried by the said damper head 45. In order that the shaft 41 may be rotated to open or close the damper 45, by a person standing upon the deck 15, there is fixed upon the shaft 41 a bevel gear indicated by the numeral 51 with

which meshes a pinion 52 at the inner end of a shaft 53 journaled through the lower end of the stack 6 at a point below the deck 15. At its opposite end, the shaft 53 is provided with a bevel gear 54 meshing with a similar gear 55 fixed at the lower end of a hand operated shaft 56. The shaft 56 is journaled vertically through the deck 15 and carries a hand wheel 57 at its upper end by means of which hand wheel it may be rotated to accomplish the result stated. The damper-head 45 has the same form of tilting and bodily flatwise movement as the damper-plate 36, already described.

From the foregoing it will be readily understood that by closing the damper 45, drafts through the stack may be completely cut off or the amount of air flowing through the stack may be regulated by adjusting the damper plate to position between its open and closed position. Furthermore it will be observed that this damper may be operated from the deck or below the deck which is a decided advantage inasmuch as by closing this damper, drafts through the stack may be completely cut off and consequently in the event of a sudden storm, the damper may be closed from either position stated.

In Fig. 3 of the drawings there is shown a modification of the invention and in this figure, parts corresponding to parts in Figs. 1 and 2 of the drawings are indicated by like reference numerals with the addition of the suffix "a." It will be observed that in the form of the invention shown in Fig. 3, the damper 45^a is the only one employed, the one 36 being omitted as well as the operating mechanism therefor. Also, the drum 17 is omitted in this form of the invention.

In Figs. 4 and 5 of the drawings there is shown a square stack in which is hinged, as at 58, a damper plate 59 coöperating with a seat 60 arranged interiorly of the said stack. A spider 61 corresponding to the spider 42 heretofore described is provided and crosses the upper end of a sleeve shaft 62 corresponding to the sleeve shaft 41. A threaded stem 63 is fitted in the sleeve shaft and by rotating the sleeve shaft the stem may be raised or lowered and by reason of the connection of a link 64 with the upper end of the stem and the underside of the damper plate 59, upward movement of the stem will result in the damper plate being swung up to open position and lowering of the stem will result in it being swung down to closed position.

It will be observed that the ventilator stack is made in several sections and of these sections one is indicated by the reference character S′ and is fitted through the deck 15 and another section is indicated by the reference character S^2 and is disposed with its lower end upon the upper end of the section S′ and held thereon by bolts 5′ secured through flanges 6′ at the said end of the sections. It will be observed that the flange 49 for the damper 45 is located directly below the upper end of the section S′ so that in extremely stormy weather when there is great liekelihood of the stack being completely blown away, the upper portion of the stack or in other words the section S^2 and all parts of the stack above the section may be removed by removing the bolt 5′, the damper 45 having been first closed.

As a means for supporting the stack in upright position and bracing the same against being blown over, there is provided a sectional guide rod comprising sections 6^a which are pivoted as at 7^a and in one of which is interposed a turn buckle 8^a adjustable to lengthen or shorten the rod as a whole. The uppermost section of this rod is pivoted to the stack directly below the mouth 7 thereof and when the rod is not in use, for example, in calm weather, it may be allowed to hang loosely as shown in Fig. 1 of the drawings. However, in stormy weather, the rod is swung out to about the position shown in Fig. 2 of the drawings and the lower end of its lowermost section, formed with an eye 9^a, is secured to the deck by any suitable securing means.

What is claimed is:—

1. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a tiltable damper arranged in the stack above the opening, a single means for actuating said damper in a plurality of directions, first to tilt it and, then, to move it bodily flatwise longitudinally of the stack, a damper controlling said opening, and a damper-seat within the stack and arranged in the path of movement of one of said dampers, and in relation to which said damper is bodily movable in and longitudinally of the stack.

2. In a ventilator of the class described, a stack, a drum surrounding the stack and open at its lower end, the stack being formed with an opening establishing communication between the interior of the stack and the upper end of the drum, a tiltable damper arranged in the stack above the opening, a single means for actuating said damper in a plurality of directions, first to tilt it and, then, to move it bodily flatwise longitudinally of the stack, a damper controlling the said opening, and an annular damper-seat mounted within the stack and against which one of said dampers is bodily movable in and longitudinally of the stack.

3. In a ventilator of the class described, a stack, a drum surrounding the stack and

open at its lower end, baffles arranged within the drum, the stack being formed with an opening establishing communication between its interior and the upper end of the drum, a damper arranged in the stack above the opening, a single means for actuating said damper in a plurality of directions, first to tilt it and, then, to move it bodily flatwise longitudinally of the stack, a damper for controlling the said opening, and an annular damper-seat mounted within the stack and against which one of said dampers is bodily movable in and longitudinally of the stack.

4. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a damper arranged in the stack above the opening, a damper for controlling the said opening, connecting means between said dampers whereby the opening of one of them effects a simultaneous closing of the other, and a damper arranged in the stack below the said opening and operable independently of said first mentioned damper whereby it may be opened or closed irrespective of the operation of said first mentioned damper, said last-mentioned damper being bodily movable within the stack and longitudinally thereof when being actuated from an opening position to a closing position.

5. In a ventilator of the class described, a stack, a drum surrounding the stack and communicating therewith and open to the atmosphere, a damper arranged in the stack above the opening, a damper arranged in the stack adjacent the point of communication of the stack with the drum and normally occupying a position below the plane of said first-mentioned damper, a damper-seat disposed within said stack, and a damper arranged in the stack below the point of communication between the stack and drum and bodily movable longitudinally of the stack from a position removed from said seat to a position in engagement therewith.

6. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a tiltable damper arranged in the stack above the opening, and being also movable bodily longitudinally of the stack while being actuated from a closing to an opening position or vice versa, a slidable damper for controlling the said opening, and operating means common to both dampers whereby the tiltable damper is actuated on its fulcrum and also longitudinally while said slidable damper is likewise moved longitudinally of the stack.

7. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a tiltable damper arranged in the stack above the opening, a slidable damper for controlling the said opening and movable bodily longitudinally of the stack, while being actuated from a closing to an opening position or vice versa, and operating means common to both of the dampers and operable to adjust the dampers relatively to position between their open and closed positions, whereby the tiltable damper is actuated on its fulcrum while said slidable damper is moved longitudinally of the stack.

8. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a tiltable damper arranged in the stack above the opening, a slidable damper for controlling the said opening and movable bodily longitudinally of the stack, while being actuated from a closing to an opening position or vice versa, and means common to both dampers for moving said tiltable damper on its fulcrum to closed position as the other damper is moved longitudinally to open position, and vice versa.

9. In a ventilator of the class described, a stack, a drum surrounding the stack and open at one end, the stack being formed with an opening establishing communication between the drum and the interior of the stack, a tiltable damper arranged in the stack above the opening, a slidable damper for controlling the said opening and movable bodily longitudinally of the stack, while being actuated from a closing to an opening position or vice versa, a damper arranged in the stack below the opening, operating means common to the two first mentioned dampers, whereby one of said dampers is moved on its fulcrum while said other damper is moved vertically, and independently operating means for the last mentioned damper, whereby it may be actuated irrespective of the operation and position of either or both of said other dampers to control the passage of air therethrough and to preclude entrance of water through the stack.

10. In a ventilator of the class described, a stack, a drum surrounding the stack, the said drum being in communication with the interior of the stack, a damper arranged in the stack above the point of communication between the stack and drum and fulcrumed approximately intermediate of its edges whereby when in its open position it will be substantially parallel with the walls of said stack and, when closed, it will occupy a position at substantially right angles to

the walls of said stack, and adapted to be bodily moved vertically in a direction parallel with the walls of said stack, a damper-seat in relation to which said damper is bodily shifted, a damper for controlling communication between the stack and drum, means common to both said dampers for operating the same, whereby one of them is rocked on its fulcrum while the other is given a sliding movement, and a damper arranged in the stack below the point of communication between the stack and drum and operable independently of said other dampers and irrespective of the operation and position thereof.

11. In a ventilator of the class described, a stack, a drum in communication with the stack, a damper arranged in the stack above the point of communication between the stack and drum and occupying a position when closed at right angles to the walls of the stack and, when open, occupying a position substantially parallel with said walls, a damper arranged to control the communication between the stack and drum and movable simultaneously with and in relation to said first-mentioned damper, and a damper-engaging instrumentality arranged in the path of one of said dampers and in relation to which instrumentality said damper is bodily shiftable flatwise.

12. In a ventilator of the class described, a stack, a sleeve shaft mounted for rotation in the stack, a damper plate mounted for tilting movement in the stack, means for rotating the sleeve shaft, and a threaded stem connected to the damper plate and threaded into the sleeve shaft.

13. In a ventilator of the class described, a stack, a sleeve shaft mounted for rotation in the stack, a stem threaded into the sleeve shaft, means for rotating the sleeve shaft, the said stem pivotally connected to the damper plate, a link having pivotal connection with the damper plate to one side of the point of pivotal connection of the stem therewith.

14. In a ventilator of the class described, a sleeve shaft, means for rotating the said shaft, a stem threaded into the said shaft, a damper plate controlled by the movement of the stem into and out of the shaft, a drum surrounding the stack, said stack being formed with an opening establishing communication between its interior and the drum, and a damper adjustable upon the sleeve shaft for controlling the opening upon rotation of the shaft.

15. In a ventilator of the class described, a stack, the said stack being formed in its side with an opening, a damper arranged within the stack above the opening and fulcrumed intermediate of its edges whereby when in its closed position it will be at substantially right angles to the walls of the stack and when open it will be substantially parallel with the walls thereof, said damper being tiltable and bodily shiftable flatwise, a damper arranged within the stack for controlling the opening, and means common to both of said dampers for operating the same simultaneously to rock one damper on its fulcrum and to actuate the other in relation to said opening.

16. In a ventilator of the class described, a stack, the said stack being formed in its side with an opening, a sleeve shaft mounted for rotation in the stack, a threaded stem in the sleeve shaft, a damper plate arranged within the stack above the opening therein and movable by the said stem, and a damper threaded upon the sleeve shaft and adjustable thereby to control the opening in the stack, and means for rotating the said sleeve shaft.

17. In a ventilator stack, a plurality of sections, one section being the deck section and the other section being the section thereabove, the two sections being removably secured together end to end in close proximity to the deck in which said stack is disposed, a damper seat in the deck section below the upper end thereof, and a damper in the deck section, and means operating by a single actuation for successively tilting and bodily shifting said damper flatwise to and from the seat whereby it operates to control the passage through said deck-section if said upper section is removed.

18. A ventilator including in combination, a stack, and a deflecting-member arranged adjacent the exterior surface of the stack and having an opening, the stack being also provided with an opening for establishing communication between said deflecting-member and the interior of the stack, and a plurality of dampers for controlling said openings simultaneously, one of said dampers being tiltable so that, when in the closed position, it will be at substantially right angles to the walls of the stack, and when in the open position it will be substantially parallel therewith, and a damper seat in relation to which said tiltable damper is bodily shiftable flatwise.

19. A ventilator including in combination, a stack, and a deflecting member arranged adjacent the exterior surface of the stack and having an opening, the stack being also provided with an opening for establishing communication between said deflecting member and the interior of the stack, a tiltable damper for controlling passage of air through said stack, said damper being also bodily shiftable flatwise longitudinally of the stack, and a second damper disposed at one side of said first mentioned damper for controlling the opening between said stack and member.

20. A ventilator including in combina-

tion, a stack, a deflecting member disposed adjacent to the exterior of said stack, the stack being provided with an opening for establishing communication between said member and stack, and said member being formed to permit passage of air through it from the outside into the stack, a tiltable air-controlling device interposed in the path of movement of said air, and a damper-seat in relation to which said air-controlling device is bodily shiftable flatwise.

21. A ventilator including in combination, an upstanding stack provided with an opening, a deflector-device disposed adjacent said opening, a controlling device for said opening having a tilting movement and also a flatwise shiftable movement, and means disposed independently of said stack and operating by a single motion to actuate said controlling device successively to tilt it and effect its flatwise shifting movement.

22. A ventilator including in combination, a stack-member provided with an opening intermediate of its ends, a deflecting device arranged adjacent to said opening and between which and said stack-member said opening establishes communication, a tiltable air-controlling device arranged within the member and adjacent to said opening and adapted to be bodily shifted flatwise longitudinally of the member, means operating by a single actuation to effect a tilting and also a flatwise movement of said tiltable air-controlling device, and a second controlling device arranged at one side of said opening and adapted to control the passage of air through said stack independently of said first-mentioned air-controlling device.

23. A ventilator including in combination, a member provided with an opening intermediate of its ends, a deflecting device arranged adjacent to said opening and between which and said member said opening establishes communication, a tiltable air-controlling device arranged within the member and adjacent to said opening and adapted to be bodily shifted flatwise longitudinally of the member, a second controlling device arranged at one side of and movable in relation to said opening and adapted to control the passage of air through said stack independently of said first-mentioned air-controlling device, and means common to both of said air-controlling devices for operating the same, simultaneously and relatively.

24. A ventilator including in combination, a stack, a member mounted for rotation in said stack, an air-controlling device mounted within the stack and adapted to have a tilting movement for controlling the passage of air through the stack and also a bodily shifting movement longitudinally of the stack, means for rotating said member, and an air-controlling element connecting with said air-controlling device and said member, whereby by the movement of said rotary member the tiltable air-controlling device is operated and simultaneously therewith said air-controlling element is actuated.

25. A ventilator including in combination, a stack, a member mounted for rotation in the stack, a tiltable damper mounted in the stack and adapted to control the passage of air therethrough, a damper seat within the stack, means operating by a single actuation to effect a tilting and a bodily flatwise-shifting movement of said damper in relation to said seat, means for rotating said member, and a stem connecting said tiltable damper and said rotary member whereby by rotative movement of said rotary member said tiltable member is moved from a position at right angles to the walls of the stack to a position substantially parallel therewith or to any intermediate position.

26. A ventilator including in combination, a stack, a drum communicating with the stack and open to the atmosphere, a tiltable damper arranged in the stack, a damper seat within the stack, means operating by a single actuation to effect a tilting and a bodily flatwise-shifting movement of said damper in relation to said seat, a second damper also arranged in the stack adjacent to said drum, and means for operating said dampers.

27. A ventilator including in combination, a stack, a drum disposed adjacent to said stack and communicating therewith, the stack being provided with an opening and the drum being open to the atmosphere, a damper movable in the stack above its opening, a second damper also arranged in the stack adjacent to said drum, a subjacent damper mounted in the stack, a seat for said damper, and means operating by a single actuation to effect a plurality of distinct movements of said subjacent damper, namely, a tilting movement in relation to the walls of the stack and a bodily flatwise-shifting movement in respect to said seat.

28. A ventilator including in combination, a stack provided at its upper end with a mouth and, intermediate of its ends, with an opening, an air-controlling device mounted within the stack and between said mouth and the opposite end of said stack, a damper-engaging instrumentality within the stack and in relation to which said controlling device is bodily shifted, an air-deflecting member mounted on the stack adjacent to said opening, and means for controlling the passage of air through said member into the stack.

29. A ventilator including in combination, a stack provided at its upper end with a mouth and, intermediate of its ends, with an opening, a tiltable air-controlling device

mounted within the stack and between said mouth and the opposite end of said stack, a damper-seat within the stack and in relation to which said controlling-device is bodily shifted, a deflecting member mounted on the stack adjacent to said opening, means for controlling the passage of air through said member into the stack, a second tiltable air-controlling device disposed in said stack and below the opening between said member and said stack, a damper-seat, and means operating by a single actuation to shift said damper flatwise in relation to said seat and also for tilting it in relation to the walls of the stack during a single cycle of its movement.

30. A ventilator, especially for the ventilation of ships, including in combination a vertical air-stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side-opening therein, a member-engaging seat in the stack, an adjustable member arranged in the air-stack in close proximity to but above the plane of the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said member-engaging seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, and means operating by a single actuation to move said adjustable member to tilt it and to shift it flatwise in relation to the walls of the stack.

31. A ventilator, especially for the ventilation of ships, including in combination a vertical air stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side-opening therein, a member-engaging seat in the stack, an adjustable member arranged in the air-stack in close proximity to the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said member-engaging seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, and means operating by a single actuation to move said adjustable member to tilt it and to shift it flatwise in relation to the walls of the stack, and a closing member to control the passage of air through said deflecting member and wall-opening in the stack.

32. A ventilator, especially for the ventilation of ships, including in combination a vertical air stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side opening therein, a damper-seat disposed in the stack and an adjustable member arranged in the air-stack in close proximity to the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, a closing member to control the passage of air through said deflecting member and wall-opening in the stack, and a third air-controlling member disposed within the stack above the plane of the side-opening therein and whereby the passage of air through the stack may be closed while said closing member is open.

33. A ventilator, especially for the ventilation of ships, including in combination a vertical air stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side opening therein, a damper-seat disposed in the stack and an adjustable member arranged in the air-stack in close proximity to the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, a closing member to control the passage of air through said deflecting member and wall-opening in the stack, and a third air-controlling member disposed within the stack above the plane of the side-opening therein and whereby the passage of air through the stack may be closed while said closing member is open, and operating means common to said closing member and said third air-controlling member for operating both in unison.

34. A ventilator, especially for the ventilation of ships, including in combination a vertical air stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side opening therein, a damper-seat disposed in the stack and an adjustable member arranged in the air-stack in close proximity to the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, a closing member to control the passage of air through said deflecting member and wall-opening in the stack, and a third air-controlling member disposed within the stack above the plane of the side-opening

therein and whereby the passage of air through the stack may be closed while said closing member is open, operating means common to said closing member and said third air-controlling member for operating both in unison, and mechanism for actuating said first-mentioned adjustable member independently of said operating means.

35. A ventilator, especially for the ventilation of ships, including in combination a vertical air stack open at the top and having an opening in its wall intermediate of its ends, a deflecting member constantly open to the atmosphere and mounted on the stack adjacent the side opening therein, a damper-seat disposed in the stack and an adjustable member arranged in the air-stack in close proximity to the ship's deck for controlling the passage of air entering the stack and adapted to be expeditiously shifted bodily toward and against said seat and thereby prevent the entrance of water in the event that the portion of the stack above the deck-level is removed or destroyed, a closing member to control the passage of air through said deflecting member and wall-opening in the stack, and a third air-controlling member disposed within the stack above the plane of the side-opening therein and whereby the passage of air through the stack may be closed while said closing member is open, operating means common to said closing member and said third air-controlling member for operating both in unison, and mechanism for actuating said first-mentioned adjustable member independently of said operating means, said first-mentioned adjustable member and said third air-controlling member being fulcrumed to have a tilting movement, while said closing member has a sliding movement.

36. A ventilator especially for the ventilation of ships, including in combination a vertical air-stack open at the top and having openings in its wall intermediate of its ends, a deflecting drum open to the atmosphere and mounted on said stack so as to extend to one side of the plane of said openings therein, a sliding valve adapted to be moved over said openings to close the same against passage of air therethrough, damper-seats in the stack, and two tiltable valve-members mounted within said stack above and below said sliding valve and adapted to be bodily shifted flatwise toward and away from said seats to independently control the passage of air therethrough.

37. A ventilator, especially for the ventilation of ships, including in combination a vertical air-stack open at the top and having openings in its wall intermediate of its ends, a deflecting drum provided with baffles and open to the atmosphere and mounted on said stack so as to extend to one side of the plane of said openings therein, a sliding valve adapted to be moved over said openings to close the same against passage of air therethrough, damper-seats in the stack, and two tiltable valve-members mounted within said stack above and below said sliding valve and adapted to be bodily shifted flatwise toward and away from said seats to independently control the passage of air therethrough.

38. A ventilator, especially for the ventilation of ships, including in combination a vertical air-stack open at the top and having openings in its wall intermediate of its ends, a deflecting drum open to the atmosphere and mounted on said stack so as to extend to one side of the plane of said openings therein, a sliding valve adapted to be moved over said openings to close the same against passage of air therethrough, damper-seats in the stack, and two tiltable valve-members mounted within said stack above and below said sliding valve and adapted to be bodily shifted flatwise toward and away from said damper-seats to independently control the passage of air therethrough, said stack being formed of several sections, one of which extends to the deck and is provided with the lowermost of said valve-members, while the section above is detachably connected to the lower section just above the level of the deck.

39. A ventilator, especially adapted for the ventilation of ships, including in combination a vertical stack comprising a plurality of sections and open at its top, the uppermost of said sections being rotatable, a tiltable damper-member mounted within the stack just below the point at which the section which extends to the ship's deck is jointed to the section superposed thereon whereby the full area of the air-passage in the stack is practically maintained and the direction of the air-current therethrough is left unchanged, a damper-seat in the stack, and means operable both above and below said deck for tilting and shifting said damper-member flatwise away from or toward said seat to open or close the same expeditiously.

40. A ventilator, including in combination an air-stack open at the top, a spider mounted within the stack, a damper tiltably mounted within the stack and adapted to be shifted flatwise to engage said spider, and a link device to effect by a single actuation a tilting and shifting movement of said damper in respect to said spider during a single cycle of movement of said damper.

41. A ventilator, including in combination an air-stack open at the top and comprising a plurality of sections, a tiltable damper disposed within the stack and occupying a plane below the upper end of the lowermost section, and a link device operating by a single actuation to tilt and bodily flatwise shift said damper in respect to said spider during a single cycle of movement of said damper from a position substantially at

right angles to the walls of said stack to a position substantially parallel with said walls.

42. A ventilator, including in combination an air-stack open at the top and comprising a plurality of sections, a tiltable damper disposed within the stack and occupying a plane below the upper end of the lowermost section, and a link device for tilting and flatwise shifting said damper from a position substantially at right angles to the walls of said stack to a position substantially parallel with said walls, and a plurality of connections with said damper whereby the same may be actuated at a plurality of points.

43. A ventilator, including in combination an air-stack open at its top and comprising a plurality of sections, a passage controlling device mounted within the stack in a plane below the upper end of the lowermost section, a flanged spider mounted within the stack and below the closed position of said passage controlling device, a stem upon which said device is mounted and whereby it may be elevated vertically, a link device coöperating with said stem to tilt said passage controlling device, and a plurality of connections with said stem whereby it may be actuated at a plurality of points.

44. A ventilator, including in combination an air-stack open at the top and comprising a plurality of sections, one of said sections being provided with drainage apertures whereby any water that may enter the stack may escape therefrom, a tiltable damper disposed within the stack and occupying a plane below the upper end of the lowermost section, a link device for tilting said damper from a position substantially at right angles to the walls of said stack to a position substantially parallel with said walls, and a plurality of connections with said damper whereby the same may be actuated at a plurality of points.

45. A ventilator including in combination, an air-stack, a damper-seat disposed therein, a damper, means adapted by a single actuation to tilt said damper to a position approximately parallel to the walls of the stack and, also, to shift it flatwise into engagement with said seat to form a tight joint.

46. A ventilator including in combination, an air-stack, a damper-seat disposed therein, a damper adapted to be tilted to a position approximately parallel to the walls of the stack and, also, to be shifted flatwise into engagement with said seat to form a tight joint, and a single means operating by a single actuation for successively effecting both the tilting and flatwise shifting movements of said damper.

47. A ventilator including in combination, an air-stack, an annular damper-seat within the stack, a damper, and means operated by a single actuation to shift said damper so that it will occupy an open position substantially parallel to the walls of the stack and also to tilt it to a position at substantially right angles thereto and then shift it approximately flatwise toward and into engagement with said seat to form a tight joint.

48. In combination, a ship's deck, a ventilator air-stack extending therethrough and projecting slightly above said deck, a damper occupying an open position practically at right angles to the walls of the stack, and means operating by a single actuation to tilt and flatwise shift said damper entirely within the stack and in a plane substantially at right angles to the walls of the stack and into a plane between the ship's deck and the top of said stack.

49. In combination, a ship's deck, a ventilator air-stack comprising a deck-portion extending slightly above the deck, a damper-seat in the stack below the plane of the deck, a tiltable damper, and means for tilting and flatwise shifting said damper in relation to said seat and thereby to position it against its seat and in a plane below that of the uppermost section of said deck-portion.

50. In combination, a ship's deck, a ventilator air-stack comprising a deck-portion extending slightly above the deck and apertured between the top of said portion and the plane of the upper deck, a damper-seat in the stack below the plane of the deck, a tiltable damper, and means for tilting and flatwise shifting said damper in relation to said seat and thereby to position it against its seat and in a plane below that of the uppermost section of said deck-portion.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES B. BREWER.

Witnesses:
G. HODGES CARR,
LOUISE FULLER CARR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."