Jan. 7, 1941. A. SMITH 2,227,852

VENTILATING DEVICE

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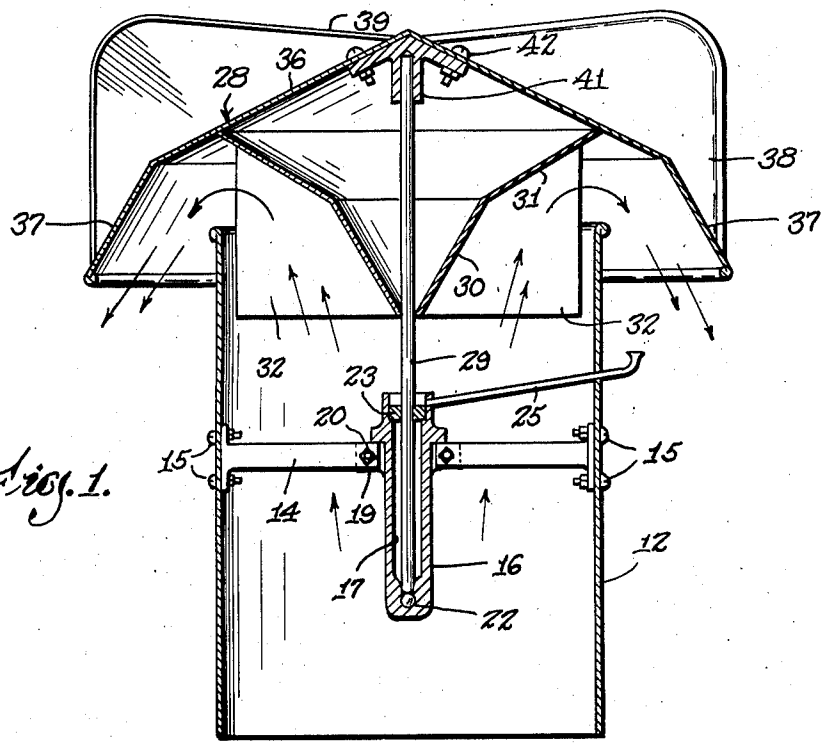


Fig. 1.

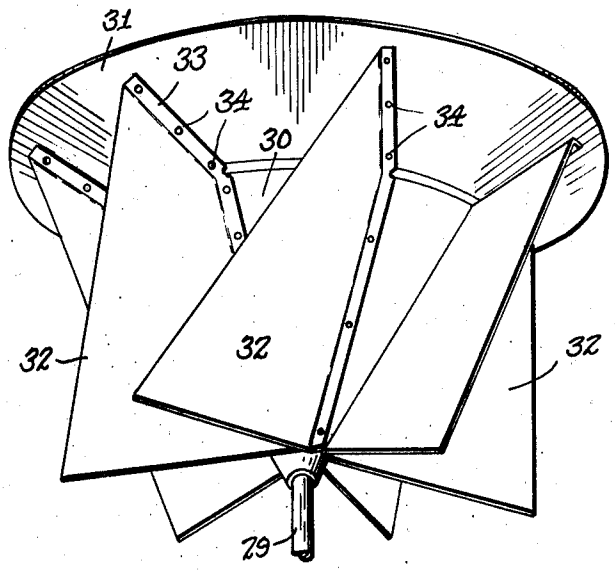


Fig. 2.

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VENTILATING DEVICE

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Application January 30, 1939, Serial No. 253,479

9 Claims. (Cl. 98—72)

This invention relates to a ventilating device, and particularly to one that is placed outside of a building and communicates with the inside to thereby accelerate the outflow of air.

The principal object of my invention is to provide a ventilator that will increase the volume of air discharged through ventilators of the same size heretofore used. Another object is to provide a simplified construction for my device, thereby making its manufacture and its assembly economical and convenient, and its operation efficient.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and operative arrangement of parts such as is disclosed by the drawing and specification. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to said disclosure; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawing:

Figure 1 is a longitudinal, sectional view of my ventilating device, as it appears in operation.

Figure 2 is a bottom view in perspective, illustrating the air exhaust blades and portion of the interior of the rotor hood.

As illustrated, I provide a flue pipe or stack 12 which is adapted to communicate with the room to be ventilated, and through which air passes from within the building outwardly. Supporting arms 14 are fastened as at 15 to said flue pipe and extend inwardly to support a housing 16 which encloses bearings, later referred to. An opening 17 in said housing 16 receives a shaft 29, later described. Said arms 14 are fastened as at 20 to lugs 19 which are integral with said housing 16. There is a ball 22 at the bottom of said housing on which said shaft 29 rotates and a bearing 23 near the top of said housing. For convenience in lubricating said ball 22 and bearing 23 I preferably provide an oil pipe 25 which enters said housing 16 through an opening therein and communicates with said bearing 23. This oil pipe 25 extends through an opening in said flue pipe 12, slanting downwardly towards said housing.

My device has a rotor hood 28 which covers and overhangs the top of said flue pipe 12, and extends outside of and below the top of said flue pipe a short distance, as illustrated in Figure 1 of the drawing. Said rotor hood 28 rotates on a shaft 29 fixed thereto, which extends into said housing 16 and rests on said ball 22. Within the interior of said rotor hood 28 a conical plate deflector formation is provided consisting of a lower portion 30, which tapers at a relatively acute angle to said shaft 29, and an upper portion 31 which tapers more abruptly outward relative to said shaft, as illustrated in Figure 1 of the drawing. The angle of said lower portion 30 should be less than 45 degrees relative to said shaft and preferably 30 degrees, while the angle of said upper portion 31 should be more than 45 degrees relative to said shaft, and preferably 60 degrees. For best results there should be a difference of at least 20 degrees and preferably 30 degrees in the angles of said lower and upper portions 30 and 31, the lower portion 30 being the nearer to vertical and the upper portion 31 being the nearer to horizontal.

This conical plate deflector formation substantially increases the capacity of my device to discharge air, as the angle of said lower portion 30 is such as to provide unusually large cubic capacity in said flue pipe for the upward passage of air at a very vital point, namely, where the air exhausting blades 32 commence, the operation of which accelerates the discharge of the rising air outwardly. The said upper portion 31 extends at a substantially greater than 45 degree angle to said shaft 29 because at this part of my ventilator the rising air must change its direction to be discharged outwardly, as indicated by the arrows in Figure 1 of the drawing. This upper portion 31 commences at a point slightly higher than the top edge of said flue pipe 12, so that the point where the air can turn to pass outwardly is at about the point where said upper portion 31 begins, or preferably, as shown, slightly below said point.

Said interior blades 32 are suction inducing, and inasmuch as the angle of said lower portion 30 provides unusually large capacity in said flue pipe 12 at this point, the said blades 32 can also be correspondingly larger, thereby increasing their capacity to discharge air. These blades 32 have flanges 33 formed at their inner edges which are fastened as at 34 to said lower and upper portions 30 and 31 of the conical plate deflector formation, said blades 32 and flanges 33 following the angles of said two portions 30 and 31, as shown in the drawing. Said blades 32 preferably extend outwardly from the outer surfaces of said deflector portions 30 and 31 in a diagonal direction to the vertical axis of said shaft 29, said rotor hood 28 rotating in a clockwise direc-

tion, with the result that said blades scoop the air upwardly and outwardly.

Said rotor hood 28 has an outside main top or hood portion 36 of conical shape, from which a skirt or side 37 extends downwardly, flaring outwardly somewhat to increase the passage for the discharge of air outwardly. The said main top portion slants at an angle of more than 45 degrees to said vertical shaft 29 and preferably at about 65 degrees, while said rotor hood side 37 slants outwardly at less than 45 degrees to said shaft 29, and preferably about 30 degrees.

On the outside of and fastened to said rotor hood 28 are vanes 38 of the pocket type, the top edge 39 of which extends upwardly and outwardly towards the outer end, the object being to increase the area of said vanes at their most efficient points, namely at their outer ends. Said vanes 38 extend from almost the apex of said rotor hood 28 to a point slightly above the bottom edge of said side 37. Said shaft 29 is fixed in a socket 41 which is fastened to said rotor hood main top portion 36 by bolts 42.

What I claim is:

1. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft, said flue pipe having means to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said rotor hood having a conical plate deflector formation embodying an upper and a lower portion, the upper portion extending outwardly at a greater angle relative to said shaft than the said lower portion, the top edge of said flue pipe being directly opposite and spaced laterally from said lower portion thereby providing a passage therebetween, the lower edge of said rotor hood extending below and being spaced laterally from said flue pipe top edge thereby providing a passage therebetween.

2. A ventilating device comprising a flue in combination with a rotor hood having a hood portion and a shaft, said flue pipe having means to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said rotor hood having a conical plate deflector formation embodying an upper and a lower portion and air exhausting blades attached thereto, the upper portion extending abruptly from and outwardly at a greater angle relative to said shaft than any part of the said lower portion, the top edge of said flue pipe being directly opposite and spaced laterally from said lower portion thereby providing a passage therebetween.

3. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft, said flue pipe having means to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said rotor hood having a conical plate deflector formation embodying an upper and a lower portion, the upper portion extending outwardly at a greater angle relative to said shaft than the said lower portion, the top edge of said flue pipe being directly opposite and spaced laterally from said lower portion thereby providing a passage therebetween, said rotor hood having air exhausting blades attached to and supported by said upper and lower portions, the upper extremities of said blades terminating at a point higher than said flue pipe top edge and spaced below the top extremity of said upper portion.

4. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft, said flue pipe having means to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said rotor hood having an interior conical plate deflector formation embodying an upper and a lower portion, the upper portion extending at a greater angle relative to said shaft than said lower portion, said rotor hood having an exterior conical portion extending from the center of said rotor hood downwardly and a side portion extending from said exterior portion downwardly and outwardly, said side portion commencing at a point opposite and laterally spaced from said upper portion and extending to a point opposite said lower portion and below and laterally spaced from the top edge of said flue pipe.

5. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft, said flue pipe having means to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said rotor hood having an interior conical plate deflector formation embodying an upper and a lower portion, the upper portion extending at a greater angle than 45 degrees relative to said shaft and said lower portion extending at an angle less than 45 degrees relative to said shaft, said rotor hood having an exterior conical portion extending downwardly and outwardly at an angle greater than 45 degrees relative to said shaft, and a side portion extending from said exterior portion downwardly and outwardly at an angle less than 45 degrees relative to said shaft, said side portion commencing at a point opposite and laterally spaced from said upper portion and extending to a point opposite said lower portion.

6. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft affixed to said rotor hood, said flue pipe having means in the interior thereof adapted to receive and rotatably support said shaft in a position whereby said rotor hood is spaced from said flue pipe, said hood portion extending over said flue pipe and below and laterally spaced from the top edge of said flue pipe, said rotor hood having an exterior conical portion extending downwardly and outwardly to a point above and laterally spaced from said flue pipe top edge, and having an exterior side portion extending from said exterior conical portion downwardly and terminating at a point laterally spaced from and below the top edge of said flue pipe, said rotor hood having an interior conical plate deflector formation embodying an upper and a lower portion, the upper portion extending at a greater angle relative to said shaft than said lower portion, and air exhausting blades fastened to and supported by said upper and lower deflector portions and extending laterally therefrom and spaced from the outside edge of said flue pipe, said flue pipe top edge being laterally opposite said deflector lower portion and said rotor hood side terminating at its lower extremity at a point laterally opposite said deflector lower portion and terminating at its upper extremity at a point opposite said deflector upper portion.

7. A ventilating device comprising a flue pipe in combination with a rotor hood having a hood portion and a shaft affixed to said rotor hood, said flue pipe having means in the interior thereof adapted to receive and rotatably support said

shaft in a position whereby said rotor hood is spaced from said flue pipe, said hood portion extending over said flue pipe and below and laterally spaced from the top edge of said flue pipe, said rotor hood having an exterior conical portion extending from an apex formed at the center of said rotor downwardly at an angle greater than 45 degrees relative to said shaft to a point above and laterally spaced from said flue pipe top edge, and having an exterior side portion extending from said exterior conical portion downwardly and outwardly at an angle less than 45 degrees relative to said shaft and terminating at a point laterally spaced from and below the top edge of said flue pipe, said rotor hood having an interior conical plate deflector formation embodying an upper and a lower portion, the upper portion extending upwardly at a greater angle relative to said shaft than said lower portion there being a difference of substantially 30 degrees between said angles of said two portions and air exhausting blades fastened to and supported by said upper and lower deflector portions and extending laterally therefrom and spaced laterally from the outside edge of said flue pipe, said flue pipe top edge being laterally opposite said deflector lower portion and said rotor hood side portion terminating at its lower extremity at a point laterally opposite said deflector lower portion and terminating at its upper extremity at a point opposite said deflector upper portion.

8. A ventilating device comprising a flue pipe in combination with a rotor hood having a shaft affixed thereto, said rotor hood having an interior conical plate deflector formation extending upwardly and outwardly, and having an exterior conical hood portion extending downwardly and outwardly and a side portion extending from said conical hood portion downwardly, said rotor hood having air exhausting blades fastened to and supported by said deflector formation, said blades extending into said flue pipe and extending above higher than said flue pipe, said deflector formation extending upwardly to a point above and as far laterally as the top edge of said flue pipe extends.

9. A ventilating device comprising a flue pipe in combination with a rotor hood comprising a shaft and air exhausting blades having portions laterally opposite said flue pipe, and a conical plate deflector formation secured to said shaft, with a lower portion extending in a straight line at an acute angle to said shaft and an upper portion extending in a straight line at an angle more abruptly outward from said shaft, said blades being fastened to and supported by said upper and lower portions, the outer edges of said blades being spaced laterally from and extending parallel with the portions of said flue pipe laterally opposite them.

ALEXANDER SMITH.

CERTIFICATE OF CORRECTION.

Patent No. 2,227,852. January 7, 1941.

ALEXANDER SMITH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 41, claim 2, after the word "flue" insert --pipe--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of March, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)