April 23, 1946. F. HONERKAMP 2,398,938

AIR OUTLET DEVICE FOR VENTILATING APPARATUS

Filed May 21, 1943

Fig. 1.

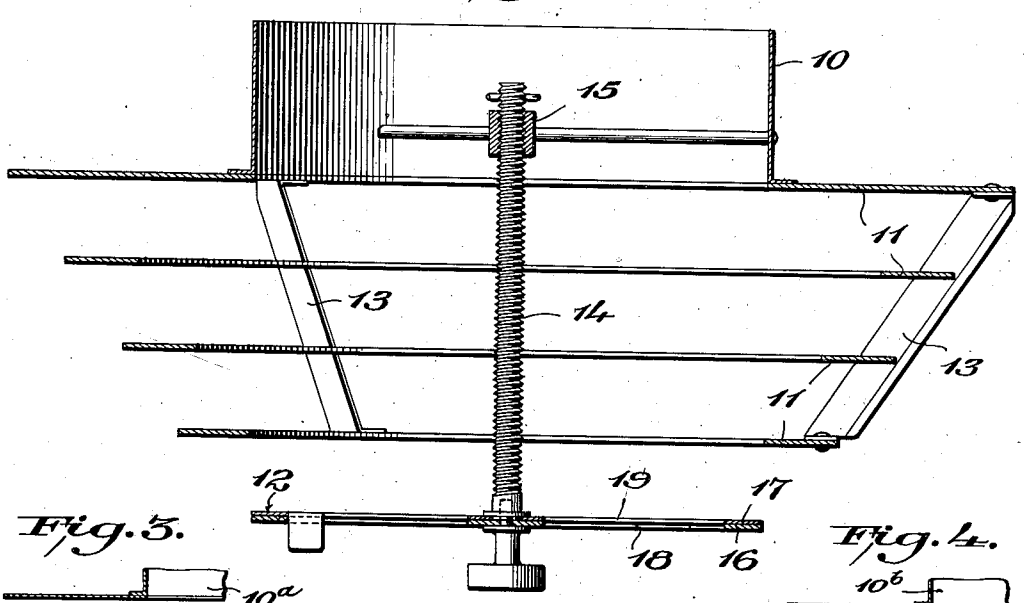


Fig. 3.



Fig. 4.

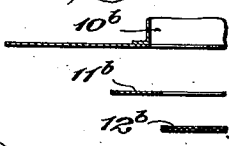
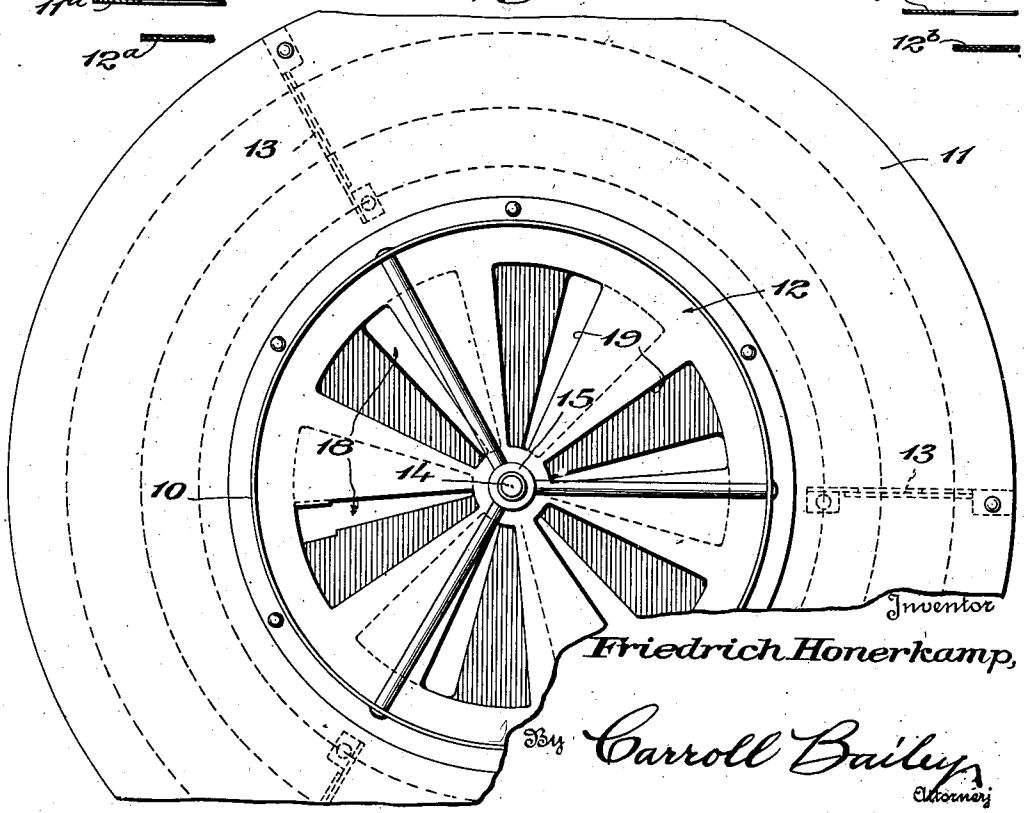


Fig. 2.



Inventor

Friedrich Honerkamp,

By Carroll Bailey

Attorney

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AIR OUTLET DEVICE FOR VENTILATING APPARATUS

Friedrich Honerkamp, New York, N. Y., assignor to Anemostat Corporation of America, New York, N. Y., a corporation of Delaware

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15 Claims. (Cl. 98—40)

This invention relates to air outlet devices for ventilating apparatus, and has particular reference to improvements in air outlet devices for controlling the delivery of fresh or treated air from air supply ducts into rooms or other enclosures.

Generally speaking, the object of the invention is to provide a simple, inexpensive air outlet device embodying a novel combination and arrangement of air-flow control elements, and provision for adjustments of certain of the same relative to another or others thereof, whereby the delivery of air through the device may be regulated with exactitude as to amount between a maximum and total denial, and the delivered air may be caused to flow from the device in various different directions and manners for particular purposes in particular instances.

With the foregoing general object in view, the invention consists in an air outlet device embodying the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the accompanying drawing, wherein like characters of reference denote corresponding parts in the different views:

Figure 1 is a central, vertical section through an air outlet device constructed in accordance with one practical embodiment of the invention.

Figure 2 is a top plan view of the device shown in Fig. 1; and

Figures 3 and 4 are fragmentary diagrammatic views similar to Fig. 1 illustrating various alternative constructions of the device.

Referring to the drawing in detail, first with particular reference to the specific embodiment of the invention illustrated in Figs. 1 and 2, it will be observed that the present air outlet device comprises a neck 10 for connection with an air supply duct to have air delivered therethrough from said duct; a series of axially spaced apart ring-like air deflecting members 11 disposed in advance of the lower or air outlet end of said neck in axial alinement therewith, and an air intercepting and deflecting disk unit 12 axially alined with said neck and said members and mounted for axial adjustment between a position closing said neck 10 against the escape of any air therefrom and various different positions in advance of said neck and with respect to said members to regulate the amount of air delivered from said neck and its direction of flow therefrom.

It will further be observed that the neck 10, the openings in the members 11 and the disk unit 12 are circular in shape; that the opening in the uppermost of said members 11 is of approximately the same diameter as the neck 10 and is fastened to said neck at the lower or outlet end thereof; that the opening in the lowermost of said members 11 also is of approximately the same diameter as said neck; that stays 13 connect said members 11 together; that the disk unit 12 is of approximately the same diameter as the neck 10 and the opening in the lowermost member 11; that the openings in intermediate members 11, of which there may be any desired number, are, progressively upwardly, of progressively increasing diameters greater than the diameter of said neck, and that said members 11 are, progressively upwardly, of progressively increasing external diameters.

The disk unit 12 may be mounted for axial adjustment in any suitable manner, but one simple and practical means for this purpose may comprise, as shown, a threaded rod 14 suitably fastened thereto, centrally thereof, and extending upwardly therefrom, and a nut 15 which may be mounted in any suitable manner within the neck 10 axially thereof and into which said rod is threaded. Thus, by rotating said rod, said disk obviously may be axially adjusted to an upper position closing the lower or outlet end of the neck 10 against the escape of any air therefrom; to a lower position in advance of or below the lowermost member 11, and to any one of an infinite number of positions with respect to the members 11 between its said upper and lower positions.

The disk unit 12 may comprise simply a single disk element totally closed against the flow of any air therethrough, or it may comprise, as shown, a pair of superimposed disk elements 16 and 17 which are suitably apertured as indicated at 18 and 19, respectively, and one of which is suitably mounted for rotation relative to the other to aline and disaline the openings 18 and 19. Thus, even if said disk unit comprises two disks as shown, it is, in effect, and to all intents and purposes, the same as a single disk when the openings 18, 19 are closed. On the other hand, by rotating one of the disk elements relative to the other to aline the openings 18, 19 to a greater or lesser extent, greater or lesser amounts of air may be permitted to flow directly downwardly through said disk unit.

Assuming that the openings 18, 19 are closed and that the disk unit 12 therefore is the equiva-

lent of a single, closed disk, it is manifest that the same, in any position of adjustment thereof in advance of or below the lower or outlet end of the neck 10, will intercept air flowing downwardly from said neck and deflect it laterally outward. It is further manifest that, depending upon the position of adjustment of said disk unit in advance of the neck 10 and relative to the members 11, and upon the internal and external diameters of said members, not only the amount of air delivered from said neck, but also its direction of flow from the device, may be regulated or controlled within wide limits.

Assuming, for example, that the disk unit 12 is adjusted to a postion in the plane of the lowermost member 11, it is apparent that most of the supplied air will be deflected laterally outwardly and very little of it will flow downwardly. If, on the other hand, the disk unit is adjusted to a position below the lowermost member 11, as shown, a lesser amount of the air will be deflected laterally outwardly by said disk unit and said members 11 and a greater amount will be permitted to flow more or less downwardly between the inner edge of any one member 11 and the outer edge of the next adjacent lower member 11.

Obviously, both the internal and the external diameters of the members 11 may be varied within wide limits to insure certain more or less definite directions of flow of the air for different positions of axial adjustment of the disk unit 12, the possibilities in this connection being infinite. In fact, it is possible in this connection to provide members 11 of such diameters, and to adjust the disk unit 12 to certain positions with respect to them, such that it will direct the delivered air to produce more or less of an aspiratory action or inflow of air through one or more of the spaces between the members 11, thus to insure intermixture of the supplied air with the room or other enclosure air within the device and in the immediate vicinity exteriorly thereof.

Obviously, in any position of axial adjustment of the disk unit 12, the openings 18, 19 of said disk unit may be more or less alined to permit more or less of the supplied air to be delivered directly downwardly through said disk unit.

A device constructed in accordance with the invention may comprise only a single member 11 instead of a series of any desired number of such members. Moreover, regardless of the number of the members 11 comprised in any given device, the internal and the external diameters of said member, or members, as the case may be, may be of any desired dimensions. Likewise, the disk unit 12 may be of any desired diameter either the same as, or greater or lesser than, the diameter of the neck 10. Thus, referring particularly to Fig. 3 of the drawing, it will be observed that the device includes only a single ring-like member, designated as 11^a; that the internal diameter of this member is greater than the diameter of the neck, designated as 10^a, and that the disk unit, designated as 12^a, likewise is of greater diameter than said neck 10 and of approximately the same diameter as the internal diameter of the member 11^a. On the other hand, it will be observed by particular reference to Fig. 4 that the internal diameter of the single ring-like member, designated as 11^b, is lesser than the diameter of the neck, designated as 10^b, and that the disk unit, designated as 12^b, also is of lesser diameter than said neck and of approximately the same diameter as the internal diameter of the member 11^b.

In each of the figures of the drawing the ring-like air flow control members have been illustrated as being flat. Manifestly, however, any or all of these members in any given device may be of flaring form as shown, for example, in Kurth Patent No. 2,185,919, of January 2, 1940. Moreover, instead of said members being of circular shape and having openings of circular shape therein, they may be of rectangular, hexagonal, octagonal or any other desired shape and, regardless of their shape, may have either circular openings or openings of any other desired shape therein. Likewise, the disk unit may be of any desired shape but preferably is of the same shape as the openings in the air flow control members, and if said unit is of other than circular shape it may be mounted in any suitable manner other than as shown for adjustment relative to said air flow control members.

From the foregoing description considered in connection with the accompanying drawing it is believed that the construction, operation and advantages of the invention will be clearly understood. It is desired to point out, however, that while only certain specific structural forms of the invention have been illustrated and described, the same is readily capable of embodiment in a variety of specifically different structural forms within its spirit and scope as defined in the appended claims.

I claim:

1. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck in advance of the outlet end thereof, and an air intercepting and deflecting disk unit of approximately the same diameter as the internal diameter of said ring-like member alined wtih said ring-like member and mounted for axial adjustment with respect thereto and entirely therethrough to different positions at either side thereof for cooperation therewith to control the direction of flow of air delivered from said neck.

2. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck in advance of the outlet end thereof, and an air intercepting and deflecting disk unit alined with said member and mounted for axial adjustment with respect thereto and entirely therethrough to different positions at either side thereof for cooperation therewith to control the direction of flow of air delivered from said neck, said disk unit and the opening in said member being of approximately the same shape and approximately equal in size.

3. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck in advance of the outlet end thereof, and an air intercepting and deflecting disk unit alined with said member and mounted for axial adjustment therethrough to a position to substantially close said neck and also to different positions at either side of said member for cooperation therewith to control the direction of flow of air delivered from said neck, said neck and said disk unit and the opening in said member being of approximately the same shape and all being approximately equal in size.

4. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck in advance of the outlet end thereof, and an air intercepting and deflecting disk unit alined with said member and mounted for axial adjustment

therethrough to a position to substantially close said neck and also to different positions at either side of said member for cooperation therewith to control the direction of flow of air delivered from said neck, said neck and said disk unit and the opening in said member being of approximately the same shape and said disk unit and said opening being of approximately equal sizes greater than the size of said neck.

5. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck in advance of the outlet end thereof, and an air intercepting and deflecting disk unit alined with said member and mounted for axial adjustment therethrough to a position to substantially close said neck and also to different positions at either side of said member for cooperation therewith to control the direction of flow of air delivered from said neck, said neck and said disk unit and the opening in said member being of approximately the same shape and said disk unit and said opening being of approximately equal sizes lesser than the size of said neck.

6. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit axially alined with said members and mounted for axial adjustment through all of the same to different positions with respect thereto at either side thereof for cooperation therewith to control the direction of flow of the air delivered from said neck, said disk unit being of approximately the same diameter as the internal diameter of the ring-like member of least internal diameter.

7. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit axially alined with said members and mounted for axial adjustment entirely through all of the same to a position closing said neck against flow of air therefrom and also to various different positions with respect to said members for cooperation therewith to control the directions of flow of the air delivered from said neck, said disk unit being of approximately the same diameter as the internal diameter of the ring-like member of least internal diameter.

8. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, the openings in said members being circular in shape and having different diameters, and an air intercepting and deflecting disk unit axially alined with said members and mounted for axial adjustment through all of the same to different positions with respect thereto at either side thereof for cooperation therewith to control the direction of flow of the air delivered from said neck, said disk unit being of approximately the same diameter as the internal diameter of the ring-like member of least internal diameter.

9. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit axially alined with said members and mounted for axial adjustment entirely therethrough to a position closing said neck against flow of air therefrom and also to various different positions with respect to said members for cooperation therewith to control the directions of flow of the air delivered from said neck, said neck and said disk unit and the openings in said members being of approximately the same shape and said disk unit and said neck being of approximately the same size.

10. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck and in advance of the outlet end thereof, and an air intercepting and deflecting disk unit alined with said member and mounted for axial adjustment with respect thereto for cooperation therewith to control the direction of flow of air delivered from said neck, said disk unit having apertures therein for flow of air therethrough and including means adjustable either to close or to vary the effective areas of said apertures.

11. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with and in advance of said neck in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit axially alined with said members and mounted for axial adjustment therethrough to a position closing said neck against flow of air therefrom and also to various different positions with respect to said members for cooperation therewith to control the directions of flow of the air delivered from said neck, said disk unit having apertures therein for flow of air therethrough and including means adjustable either to close or to vary the effective areas of said apertures.

12. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck and in advance of the outlet end thereof, and an air intercepting and deflecting disk unit in advance of said member and axially alined therewith, said disk unit having apertures therein and including means adjustable either to close or to vary the effective areas of said apertures.

13. An air outlet device comprising an air supply neck, an air flow control ring-like member disposed in axial alinement with said neck and in advance of the outlet end thereof, and an air intercepting and deflecting disk unit in advance of said member and axially alined therewith, said disk unit including a pair of superimposed apertured disks one of which is rotatably adjustable relative to the other to aline and disaline the apertures of the despective disks.

14. An air outlet device comprising an air supply neck, a series of air flow control ring-like members disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit in advance of said series of members and axially alined therewith, said disk unit hav-

ing apertures therein and including means adjustable either to close or to vary the effective areas of said apertures.

15. An air outlet device comprising an air supply neck, a series of air flow control rings disposed in axial alinement with said neck and in advance of the same in axially spaced apart relationship to each other and transversely with respect to the direction of flow of air from said neck, and an air intercepting and deflecting disk unit in advance of said neck and axially alined therewith, said disk unit including a pair of superimposed apertured disks one of which is rotatable relative to the other to aline and disaline the apertures of the respective disks.

FRIEDRICH HONERKAMP.