

July 31, 1945.

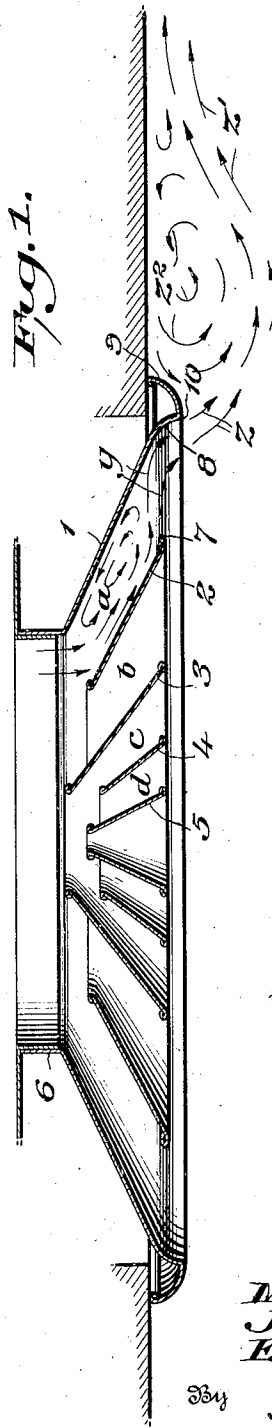
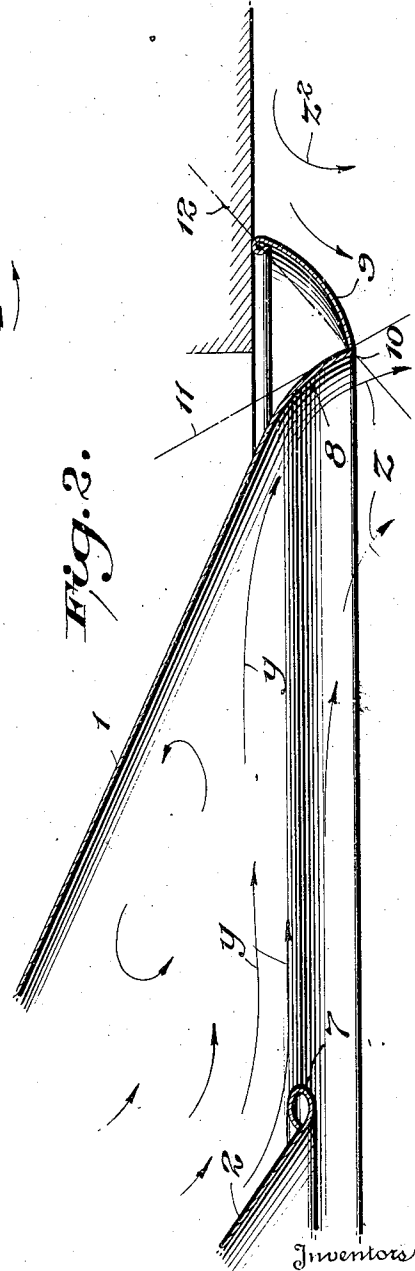
M. SERRE ET AL

2,380,553

AIR OUTLET DEVICE

Filed March 28, 1941

2 Sheets-Sheet 1



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By

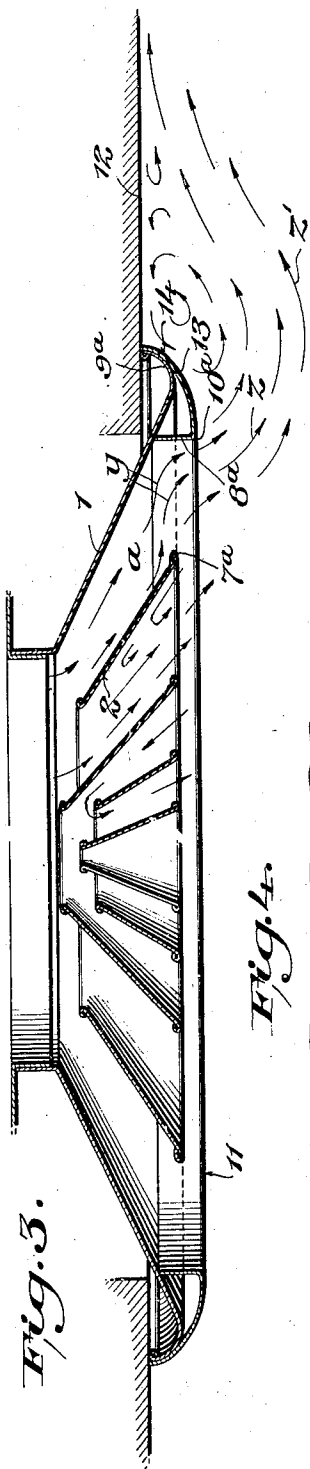
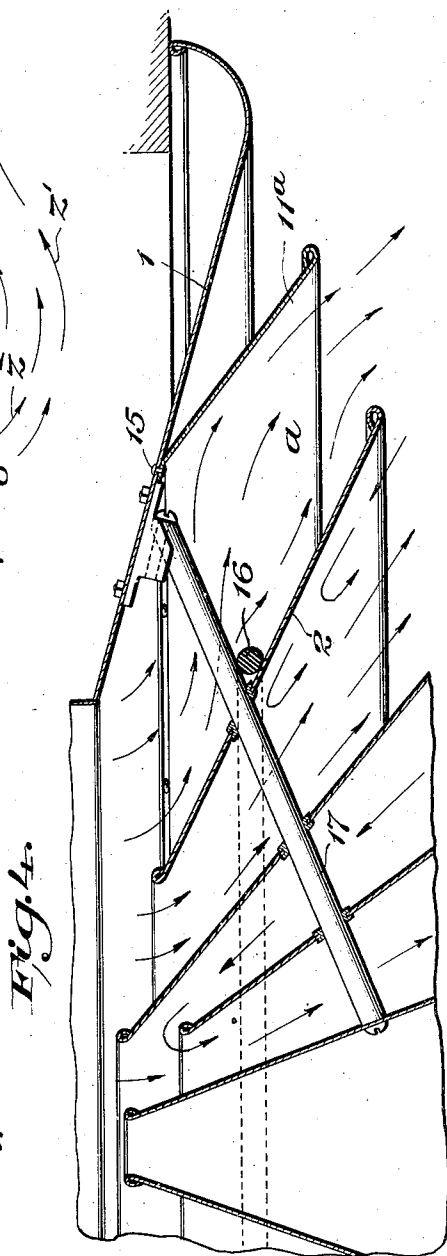
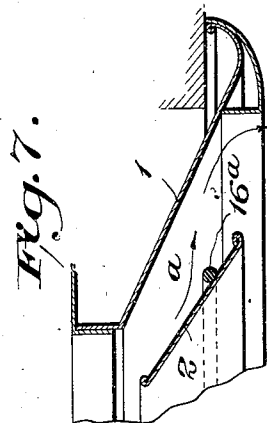
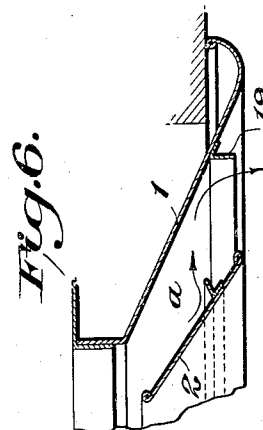
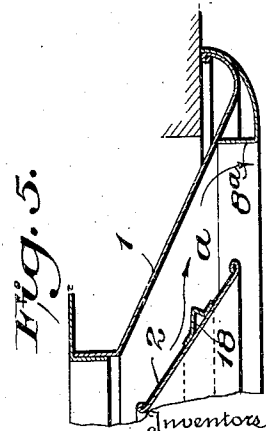
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,380,553

AIR OUTLET DEVICE

Maurice Serre, John B. Hewett, and Edward A. Schaefer, New York, N. Y., assignors to Anemostat Corporation of America, a corporation of Delaware

Application March 28, 1941, Serial No. 385,754

9 Claims. (Cl. 98—40)

This invention relates to ventilating apparatus, and has particular reference to improvements in outlet devices for the delivery of fresh or treated air from air supply ducts into rooms or other enclosures, this application being a continuation in part of the application of Maurice Serre, John B. Hewett and Edward A. Schaefer, Serial No. 326,100, filed March 26, 1940.

The purpose of most air outlet devices is to effect delivery of air into a room or other enclosure in a manner such as to cause it to mix most thoroughly and rapidly with the room or other enclosure air and to subject occupants of the room or other enclosure to the least possible sensation of draft. Outlet devices embodying various different constructions and operating in various different manners and with different degrees of efficiency to accomplish these purposes are known. It is, however, characteristic of the most efficient of them that in order to accomplish their purposes they are constructed to deflect some or all of the supplied air more or less laterally outward.

In many instances it is necessary or desirable to mount an outlet device with its delivery end, or at least the marginal portion of its delivery end, either flush with or not far below or in advance of a ceiling or other wall. When, however, this is done and the outlet device is of the type which deflects some or all of the supplied air laterally outward and delivers it more or less parallel to the ceiling or other wall, more or less smudging of the ceiling or other wall may result, depending upon the velocity of the delivered air and the direction of its flow when it impinges upon the ceiling or other wall.

Smudging of ceilings or other walls by air delivered from air outlet devices is, of course, highly objectionable. At the same time it is highly desirable to employ air outlet devices which most efficiently serve their purposes and which, to that end, are constructed to deflect some or all of the supplied air laterally outward. Accordingly, one special object of the present invention is so to construct air outlet devices of the latter type that, without detracting materially if at all from their efficiency, they are caused to effect delivery of supplied air in a manner to eliminate or at least to very materially reduce smudging in instances where they are mounted with the marginal portions of their delivery ends flush with or not far below or in advance of a ceiling or other wall.

Another special object of the invention is to provide means in the form of simple elements

which may be readily and easily applied to known, smudge producing types of air outlet devices and which, when applied thereto, render such devices practically non-smudge producing without materially if at all detracting from their efficiency or altering their appearance.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the accompanying drawings, wherein like characters of reference denote corresponding parts in related views:

Figure 1 is a central, longitudinal section through an air outlet device constructed in accordance with the present invention and illustrating by arrows the directions of flow of air in and adjacent to the device.

Figure 2 is an enlarged, fragmentary section of the Fig. 1 construction illustrating more in detail the novel features of the invention.

Figure 3 is a view similar to Fig. 1 illustrating an alternative embodiment of the invention.

Figure 4 is a view similar to Fig. 2 illustrating another alternative embodiment of the invention.

Figures 5, 6 and 7 are fragmentary views similar to Fig. 3 illustrating other alternative embodiments of the invention.

Referring to the drawings in detail, it will be observed that the present outlet device is of the general type comprising a series of successively smaller, open-ended, hollow, flaring members disposed in spaced apart relationship successively inwardly of one another to provide therebetween a series of flaring passageways. In addition, it will be observed that said device also includes, in accordance with known practice, a neck extending rearwardly from the rear end of the larger flaring member thereof to be connected with an air supply duct for the supply of air to the device.

In a device of the general type illustrated in the drawings the number of flaring members and passageways is arbitrary. Five flaring members is, however, a usual number. Accordingly, the devices illustrated in the drawings are shown as comprising five flaring members. These are designated in each instance as 1, 2, 3, 4 and 5, respectively, while the flaring passageways therebetween are designated as a, b, c and d, respectively.

ly. On the other hand, the air supply neck extending rearwardly from the rear end of the largest flaring member 1 is designated in each instance as 6.

In known devices of the type illustrated in Fig. 1 the rear end of the second largest flaring member 2 invariably is smaller in diameter than the neck 6, and this essentially is true of the relationship of the rear end of the flaring member 2 to the neck 6 of the instant device. Therefore, in the new device, as in known devices, supplied air is deflected by the flaring member 2 laterally outward through the larger or outermost passageway *a*. As to the rear ends of the remaining flaring members, their relationship to each other in known devices, as well as in devices embodying the features of the present invention, is arbitrary, depending upon the flow of air desired in the smaller passageways. The present invention is concerned primarily with the flow of air in the passageway *a* and with the results of such flow, and not with the flow in the remaining passageways. Therefore, it is not necessary to describe herein any particular relationship to each other of the rear ends of the remaining flaring members. On the contrary, it will suffice to say that in known devices, of the type under discussion, as well as in devices embodying the features of the present invention, the rear ends of the successively smaller flaring member may be of successively smaller diameter, in which event some of the air supplied through the neck 6 will enter each of the flaring passageways *a*, *b*, *c* and *d*; or, the rear end of any one or more of the flaring members may be as small as, or smaller than, the rear end of the next larger member to permit supplied air to flow across the mouth of any one or more of the passageways except, as previously indicated, the larger or outermost passageways *a*, in which event a suction effect and a consequent aspirating flow of air in any passageway across the mouth of which supplied air is directed, will result. In Fig. 1 the rear end of the flaring member 4 is shown to be as small as the rear end of the next larger flaring member 3. Thus, supplied air is permitted to flow across the mouth of the passageway *c* and thereby acts to produce a suction effect and a consequent aspirating flow of air in said passageway *c*.

In any passageway of a device of the type under consideration through which supplied air flows, there also will occur a certain amount of aspiration in the absence of some special means to prevent its occurrence. In other words, when supplied air is deflected laterally outward through any given passageway of a device of the type under consideration its tendency is to hug the wall defining the inner side of that passageway, because its natural tendency is to flow directly forwardly through the device. As a result, it will tend to produce a negative pressure and, consequently, a certain amount of aspiration in the outer side portion of the passageway.

Known devices of the type under consideration have not had embodied therein means to prevent aspiration in any passageway through which supplied air flows. Consequently, since in all prior devices supplied air flows through the larger or outermost passageway *a*, there has always occurred heretofore a certain amount of aspiration in the outer portion of said outermost passageway.

Air leaving any passageway of a device of the type under consideration expands rapidly. Moreover, air in motion tends to seek surfaces adja-

cent to which it flows, due possibly to frictional resistance to and retardation of its flow by such surfaces. In the case of a device of the type under consideration mounted with the front end of the outermost flaring member thereof adjacent to a ceiling or other wall, the ceiling or other wall and the front end portion of the outermost flaring member 1 are the surfaces which affect the air leaving the passageway *a*. In known devices of the type under consideration the outermost flaring member 1 usually is straight in cross section from its rear end to its forwardmost end portion and then is curved gradually outwardly and rearwardly to provide a marginal finishing portion. Air leaving the passageway *a* of known devices in seeking and tending to follow the rearwardly curved marginal finishing portion of said flaring member 1 and in seeking and in tending to follow the ceiling or other wall, thus takes a direction of motion more or less sharply rearwardly. Besides, it is drawn rearwardly and toward the marginal portion of the flaring member 1 by the aspiration occurring in the outer portion of the passageway *a*. It thus impinges with considerable velocity upon the ceiling or other wall in a direction somewhat normal thereto and not far distant outwardly from the device, where most pronounced smudging is observed. Theoretically, therefore, the velocity of the air and the direction of its flow when it impinges upon the ceiling or other wall are important factors insofar as concerns the causes of smudging. Theoretically, too, if aspiration in the outer portion of the outermost passageway *a* is prevented, thereby eliminating this cause of drawing the air leaving the passageway *a* sharply outwardly and rearwardly, and if the air leaving the said passageway *a* is given a direction of motion such that it does not strike the ceiling or other wall until it is well outward of the device, when it has lost most of its velocity and when its direction of flow is nearly parallel to the ceiling or other wall, little or no smudging will occur. Experiments have demonstrated the truth of these theories. Therefore, the improved device is constructed to prevent aspiration in the outer portion of the outermost passageway *a* and to impart to air leaving said passageway *a* a direction of motion such that it does not contact with the ceiling or other wall until it is well outwardly of the device and its velocity is negligible and its direction of flow is nearly parallel to the ceiling or other wall.

In known devices of the type under consideration the front ends of the flaring members may be disposed in a common plane, or the successively smaller members may have their front ends disposed successively forwardly of one another. According to the present invention, however, the front end of the second largest flaring member 2 is disposed in a plane spaced rearwardly from the plane of the front end of the largest flaring member 1. Moreover, the said front end of the member 2 is beaded, flanged or otherwise suitably directed laterally outward as indicated at 7. Furthermore, the front end portion of the largest flaring member 1 is curved or otherwise suitably directed forwardly at a lesser angle to the longitudinal axis of the device than the straight-walled rear portion of said member, as indicated at 8.

The directing forwardly, as at 8, of the front end portion of the member 1 relative to the rear portion of said member, combined with the disposition of the front end of the member 2 in a plane spaced rearwardly from the plane of the front end of the member 1, and the outward

beading or flanging of the front end of the member 2, has the effect of constricting the width of the outlet end of the passageway a as compared with known devices regardless of the amounts of flare of the members 1 and 2. In this connection and according to the invention the amount of rearward disposition of the front end of the member 2 relative to the front end of the member 1, the width of the bead or flange 7 at the front end of the member 2 and the amount that the front end portion of the member 1 is directed forwardly relative to the rear portion of said member, all are such that supplied air first is deflected by the bead or flange 7 outwardly across the outlet end of the passageway a against the portion 8 of the member 1, as indicated by the arrows y in Figs. 1 and 2. Aspiration in the passageway a thus is prevented. By the portion 8 of the member 1 the supplied air then is directed forwardly, as indicated by the arrows z in Figs. 1 and 2, so that when leaving, and after leaving, said passageway a , it flows forwardly in a path at a lesser angle to the axis of the device than when flowing through said passageway a rearwardly of the bead or flange 7. The air in leaving the passageway a thus is directed more forwardly than in known devices, and therefore travels a considerable distance laterally outward from the device before it contacts with the ceiling or other wall, as indicated by the arrows Z' in Fig. 1. Moreover, by the time the air finally contacts with the ceiling or other wall it has assumed a direction of flow nearly parallel to the ceiling or other wall and its velocity has become negligible, so that little or no smudging results.

Adjacent to the device, between the ceiling or other wall and the stream of air flowing from the passageway a , there occur gently rolling eddies of air, as indicated by the arrows Z^2 in Figs. 1 and 2. These eddies, however, lack any appreciable velocity and therefore have little or no effect in producing smudging.

As to the flaring members that are disposed inwardly of the flaring member 2 in a device as illustrated in Fig. 1, their front ends may be disposed in a common plane with the front end of the member 2, as illustrated, or the successively smaller of such members may have their front ends disposed successively forwardly of one another or in any other desired manner.

While air in motion tends to cling to and to follow any straight or gradually curved surface with which it contacts, it has little or no tendency to cling to and follow sharp corners. Accordingly, at the junction of the front end of the portion 8 with the rearwardly curved marginal finishing portion 9 of the outermost flaring member 1 there preferably is provided a sharp corner 10. Thus, air in leaving the passageway a at the outer side thereof has little or no tendency to flow rearwardly around the corner 10 and, consequently, is unaffected by the gradually curved, rearwardly directed, marginal finishing portion 9 of the member 1. At the same time, the finishing portion 9 is directed rather sharply rearwardly from the corner 10 to further insure against air leaving the outer portion of the passageway a being attracted rearwardly by the same.

It has been found in practice that a suitable and practical curve for the portion 8 of the member 1 is a curve such that a tangent 11 thereto (Fig. 2) where it meets the small curve of the corner 10, is disposed at an angle of approximately sixty degrees to the plane of the front end of the member 1. It has been found, too, that

while this angle may be considerably greater than sixty degrees, it cannot be materially less than sixty degrees. It has also been found that while the rearwardly curved, marginal finishing portion 9 of the member 1 is of little functional importance in the improved device, best results are obtained if a straight line 12 drawn between the ends of the arc of this portion is disposed at an angle of not less and preferably greater than thirty degrees to the plane of the front end of the member 1, as thereby space is afforded to permit the free secondary air motion or eddy currents indicated by the arrows Z^2 .

Of course, the rearwardly directed marginal finishing portion 9 might be eliminated and the device might be mounted with the front end of the curved portion 8 of the outermost flaring member 1 either flush, or substantially flush, with a ceiling or other wall, and even in that case little or no smudging would result. The portion 9 is preferred, however, not only because it imparts an attractive finish to the outer portion of the device, but because it acts to space the front end of the portion 8 forwardly from the ceiling or other wall and thereby assists in insuring that air flowing from the passageway a will travel well outwardly from the device before it contacts with the ceiling or other wall, and that ample space will be provided to accommodate the eddy currents Z^2 so that said currents may move gently and will have little or no smudging effect.

Figures 1 and 2 represent an improved original constructional form for devices of the instant type. Frequently, however, it is desirable to convert a known device of the instant type into a device having the non-smudging characteristics of a device as illustrated in Figs. 1 and 2. In this connection and in accordance with the present invention, Figure 3 of the drawings illustrates that there may be attached to the outermost flaring member 1 of a device of the known instant type, a ring 11 of such cross sectional size and shape as to provide a wall 8^a which defines the outer side of the outer end portion of the passageway a and which not only is disposed at a lesser angle to the longitudinal axis of the device than the rear portion of said flaring member 1, but extends a suitable distance forwardly of the front end of the flaring member 2 so as to be in intercepting relationship to air deflected laterally outward by the usual bead or flange 7^a at the front end of said member 2. Thus, supplied air flowing through the passageway a first is deflected by the bead or flange 7^a laterally outward across the front end portion of said passageway against the wall 8^a, as indicated by the arrows y , whereby aspiration is prevented, and by said wall 8^a then is directed forwardly, as indicated by the arrows z , so that upon leaving said passageway it flows forwardly in a path at a considerably lesser angle to the axis of the device than would be the case in the absence of the ring 11. As a result, the air travels a considerable distance forwardly and laterally outward from the device, as indicated by the arrows z' , before it contacts with the ceiling or other wall 12. Moreover, by the time the air finally contacts with the ceiling or other wall 12 it has assumed a direction of flow nearly parallel to the ceiling or other wall and its velocity has become so reduced that little or no smudging results. In other words, by attaching a ring such as the ring 11 to the flaring member 1 of a known device of the instant type and by disposing said ring in the manner illustrated and described in connection

with Fig. 3, the known device may readily be adapted or converted to operate in the same manner as the device illustrated in Figs. 1 and 2 of the drawings.

As shown in Fig. 3, the ring 11 may be of such cross sectional form as not only to provide the wall 8^a, but also to provide a finishing surface 13 extending from the front end of the wall 8^a to the usual rearwardly curved marginal portion 9^a of the member 1. In this connection the ring 11 may be pressed or otherwise formed from sheet metal or other suitable sheet material to provide the wall 8^a and an outwardly and rearwardly curved flange 14 to embrace the rim or marginal portion of the member 1 and to afford the finishing surface 13, or said ring may be of solid cross section and may be shaped at its inner and front sides to provide the wall 8^a and the finishing surface 13 and may be formed at its rear to snugly interfit with the front end portion of the member 1. In either case a relatively sharp corner 10^a preferably is provided at the junction of the wall 8^a with the finishing surface 13 for the reason heretofore stated in connection with the Figs. 1 and 2 embodiment of the invention.

The wall 8^a may extend parallel to the axis of the device as illustrated in the present instance, or it may extend forwardly and outwardly at any suitable angle relative to the axis of the device and may be straight, as shown, or curved.

As heretofore stated, some prior devices of the type under consideration are characterized by having the forward ends of the successively smaller flaring members stepped successively forwardly of one another. Fig. 4 illustrates a device of this type and means according to one practical embodiment of the invention for converting such a device into a device having smudge eliminating or reducing features.

According to Fig. 4 a ring 11^a of sheet metal or other suitable sheet material, and of open-ended, forwardly flaring form, is disposed inwardly of the flaring member 1 and is riveted or otherwise suitably secured along its rear marginal portion to said member 1 as indicated at 15. This ring 11^a has a lesser amount of flare than the member 1 and provides a wall which defines the outer side of the front end portion of the passageway *a* and which is disposed at a lesser angle to the axis of the device than said member 1. Moreover, an air deflector element 16 such as a ring of rubber of circular cross section, or of any other suitable material of any other suitable cross section, is suitably mounted against the outer side of the member 2 at a point suitably spaced rearwardly from the front end of the ring 11^a so as to deflect supplied air laterally outward across the passageway *a* against said ring 11^a in the same general manner as supplied air is deflected by the bead or flange 7 and 7^a against the wall 8 or 8^a of the Fig. 1 or the Fig. 3 form of the invention. As a result, the converted device illustrated in Fig. 5 has the same general smudge eliminating or reducing mode of operation as set forth in connection with the device illustrated in Fig. 1. Obviously, the ring 11^a may be of solid cross sectional form to fit throughout its length against the flaring member 1 and may be formed so that it affords a wall defining the forward end portion of the passageway *a* disposed at any suitable angle to the axis of the device.

The flaring members of devices of the general type under consideration usually are connected

together by struts as indicated at 17 in Fig. 4, and such struts may advantageously be employed as positioning means for the deflector element 16. In other words, said deflector element may be disposed in the acute angle corners formed by the struts 16 and the member 2.

While each of the Figs. 1 and 3 embodiments of the invention illustrates an outwardly directed bead or flange at the front end of the flaring member 2 for the purpose of deflecting supplied air laterally outward across the front end portion of the passageway *a* against the wall 8 or 8^a as the case may be, such a bead or flange at the front end of the flaring member 2 is by no means essential. On the contrary, a ring such as the ring 16 shown in Fig. 4 or, equivalently, a ring of sheet metal or of any other suitable material and of any suitable cross sectional shape, may be attached in any suitable manner to the flaring member 2 at the outer side at any suitable point along the length thereof to serve the same purpose as the bead or flange 7 or 7^a. In this connection, Fig. 5 of the drawings illustrates a construction which is the same as the Fig. 3 construction, except that a ring 18 of sheet metal or other suitable material is attached to the flaring member 2 at the outer side thereof and at a point spaced rearwardly from the front end of said flaring member to deflect supplied air across the passageway *a* against the wall 8^a, while Fig. 7 of the drawings illustrates a construction which is the same as the Fig. 5 construction except that a ring 16^a similar to the ring 16 of the Fig. 4 construction is employed in lieu of a ring such as the ring 18 of the Fig. 5 construction.

Each of Figs. 3, 5 and 7 illustrates the ring 11 as being formed from sheet material and as being bent to provide not only the wall 8^a, but the outwardly and rearwardly directed portion 13 affording the finishing surface 9^a. However, it is not necessary that the ring 11 include any outwardly and rearwardly directed portion such as the portion 13. Nor is it necessary that said ring 11 extend beyond the front end of the flaring member 1. On the contrary, a ring 19 devoid of any portion such as the portion 13 of the ring 11 may be employed in lieu of said ring 11 and may have its front end disposed either flush with or rearwardly of the front end of the flaring member 1, as indicated in Fig. 6 of the drawings. If, however, the front end of the ring 19 does not extend beyond the front end of the flaring member 1, then it is necessary to dispose the front end of the flaring member 2 rearwardly of the front end of the flaring member 1 if dependence is placed in a bead or flange such as the bead or flange 7 or 7^a at the front end of said flaring member 2 to deflect supplied air across the passageway *a* against the ring 19. If, on the other hand, dependence is placed in a ring attached to the outer side of the flaring member 2 to deflect supplied air across the passageway *a*, then obviously it is immaterial whether the front end of the flaring member 2 is or is not beaded or flanged and whether it is or is not disposed rearwardly of the front end of the ring 11. Moreover, it is obvious that an air deflector ring of any suitable form may be employed at the outer side of the flaring member 2 in lieu of a bead or flange at the front end of said flaring member, not only in association with a ring 11 of any suitable form attached to the flaring member 1, but also in association with a flaring member 1 which itself is formed, as shown in Figs. 1 and 2 for example, to cause supplied air to be delivered for-

wardly from the passageway *a*. In other words, a deflector ring of any suitable type attached at any suitable point to the flaring member 2 at the outer side thereof may be used either in association with a flaring member 1 of the type shown in Figs. 1 and 2 or in association with a ring of any suitable type attached to the flaring member 1.

Each of Figs. 1 to 7 of the drawings illustrates the present invention as embodied in an air outlet device of the type comprising a series of successively smaller, open-ended, hollow, flaring members disposed in spaced apart relationship successively inwardly of one another. Since, however, in an outlet device of this type the invention is, as aforesaid, concerned primarily with the outermost and the next smaller flaring members, it will be understood that the features comprising the invention are not limited to use in association with outlets of the specific form illustrated in Figs. 1 to 7 of the drawings, but are equally applicable to various other outlets of specifically different forms so long as they have equivalents of the flaring members 1 and 2. Moreover, it will be understood that in outlet devices of the type illustrated comprising a series of hollow, flaring members, the features comprising the invention are not necessarily restricted to use in association with the outermost and the next smaller flaring members, but may, if desired, be used in association with any of the flaring members, either for non-smudging or other purposes.

From the foregoing description considered in connection with the accompanying drawings it will be appreciated that the essence of the invention resides in the provision, in an air outlet device of the type which acts to deflect some or all of the supplied air in a straight path forwardly and outwardly, of means whereby the supplied air is prevented from producing aspiration and whereby it is caused to be delivered from the device at a lesser angle to the longitudinal axis of the device than would be the case in the absence of said means, thus to render the device practically non-smudge producing. Moreover, it will be appreciated that while the drawings illustrate only certain specific forms of means for this purpose, said means may take various other specifically different but equivalent forms within the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In an air outlet device, an open-ended, hollow, forwardly flaring member, a second annular, forwardly flaring member within said first mentioned member spaced therefrom to provide between said members an open-ended annular air passageway flaring forwardly and outwardly relative to the longitudinal axis of the device, means for the supply of air to said passageway through the rear open end thereof, and a ring separate from said first mentioned flaring member attached thereto and affording a wall at the front thereof disposed at a lesser angle to the longitudinal axis of the device than the rear portion of said member and in the path of flow of supplied air flowing through said passageway to intercept supplied air flowing through said passageway and to cause it to be delivered from the front of the device at a lesser angle to the longitudinal axis of the device than during its flow through the rear portion of said passageway.

2. An air outlet device as set forth in claim 1 in which the ring includes a portion extending outwardly and rearwardly from the front end of

the air intercepting wall thereof into covering relationship to the front end of the first mentioned flaring member.

3. An air outlet device as set forth in claim 1 in which the ring is disposed entirely rearwardly of the front end of the first mentioned flaring member.

4. An air outlet device as set forth in claim 1 in which the ring extends forwardly beyond the front end of the first mentioned flaring member.

5. In an air outlet device, an open-ended hollow flaring member, a forwardly flaring member within said first mentioned member spaced therefrom to provide between said members an open-ended air passageway flaring forwardly and outwardly relative to the longitudinal axis of the device, means for the supply of air to said passageway through the open rear end thereof, said members being constructed and being spaced apart so that the major portion of supplied air flowing through said passageway may flow in a straight path through the major rear portion thereof forwardly and outwardly relative to the longitudinal axis of the device, a member separate from and attached to said first mentioned flaring member and providing at the front end portion thereof a wall disposed at a lesser angle to the longitudinal axis of the device than the rear portion of said first mentioned member to intercept air flowing through said passageway and to cause it to flow from the front end of said passageway at a lesser angle to the longitudinal axis of the device than during its flow through the rear portion of said passageway, means extending outwardly from said second mentioned member at more nearly a right angle to the longitudinal axis of the device than said second mentioned flaring member and spaced rearwardly relative to said air intercepting wall at the front end of said first mentioned flaring member to deflect the supplied air outwardly across said passageway against said air intercepting wall, a finishing marginal portion for said first mentioned flaring member extending outwardly and rearwardly from the front end of said air intercepting wall, and a sharp corner at the junction of the front end of said air intercepting wall with said finishing marginal portion.

6. In an air outlet device, an open-ended hollow flaring member, a forwardly flaring member within said first mentioned member spaced therefrom to provide between said members an open-ended air passageway flaring forwardly and outwardly relative to the longitudinal axis of the device, means for the supply of air to said passageway through the open rear end thereof, said members being constructed and being spaced apart so that the major portion of supplied air flowing through said passageway may flow in a straight path through the major rear portion thereof forwardly and outwardly relative to the longitudinal axis of the device, said first mentioned flaring member having at the front end thereof a wall portion disposed at a lesser angle to the longitudinal axis of the device than the rear portion thereof to intercept air flowing through said passageway and to cause it to flow from the front end of said passageway at a lesser angle to the longitudinal axis of the device than during its flow through the rear portion of said passageway, means extending outwardly from said second mentioned flaring member to deflect the supplied air outwardly across said passageway against said air intercepting wall portion of said first mentioned member, a finishing marginal portion for said first mentioned member ex-

tending outwardly and rearwardly from the front end of said air intercepting wall portion, and a sharp corner at the junction of said finishing marginal portion with said air intercepting wall portion, said finishing marginal portion beginning directly at said sharp corner to recede rearwardly.

7. An air outlet device as set forth in claim 6 in which the front end portion of the first mentioned flaring member first is extended inwardly relative to the rear portion of said member to provide the air intercepting wall portion and then is extended outwardly and rearwardly to provide the marginal finishing portion.

8. An air outlet device as set forth in claim 6 15

in which the finishing marginal portion is curved outwardly and rearwardly and in which the angle subtended by a straight line drawn between the ends of the arc of curvature thereof and a plane at right angles to the longitudinal axis of the device is not less than thirty degrees.

9. An air outlet device as set forth in claim 6 in which the angle subtended by a plane at right angles to the longitudinal axis of the device and a straight line drawn between the ends of the finishing marginal portion is not less than thirty degrees.

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