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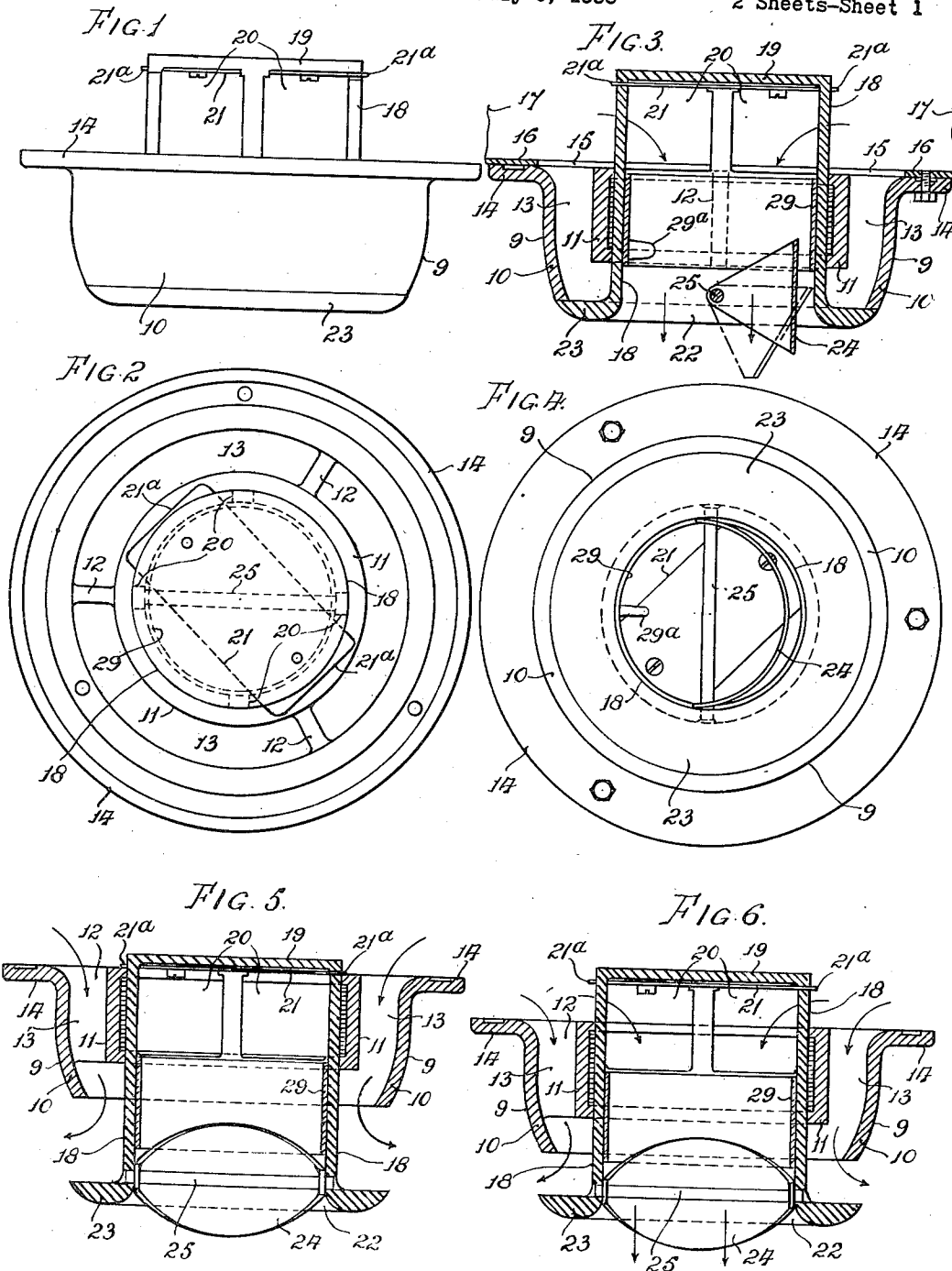
S. HALL ET AL

2,197,614

AIR DIRECTING DEVICE OR NOZZLE FOR USE IN VENTILATING SYSTEMS

Filed July 6, 1938

2 Sheets-Sheet 1



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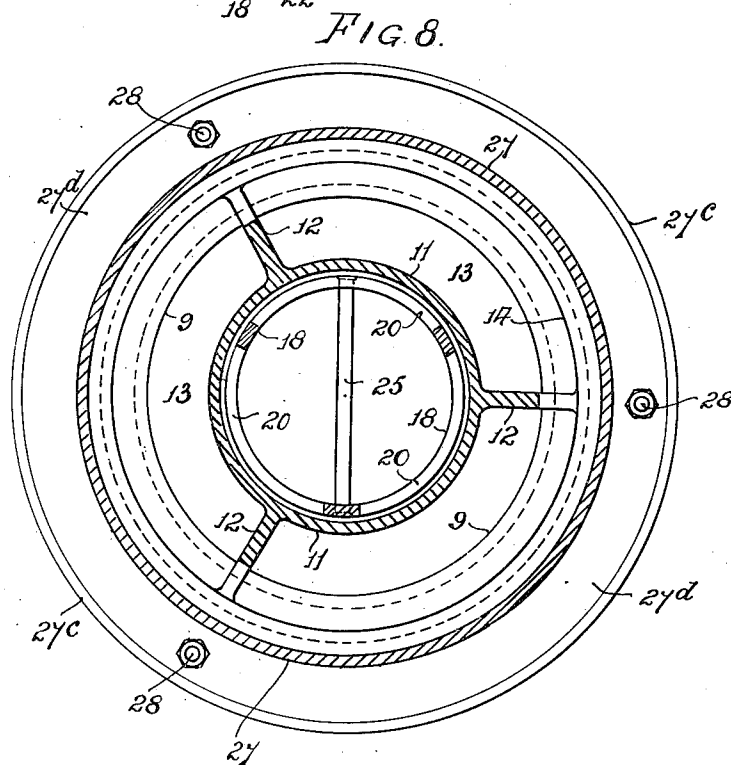
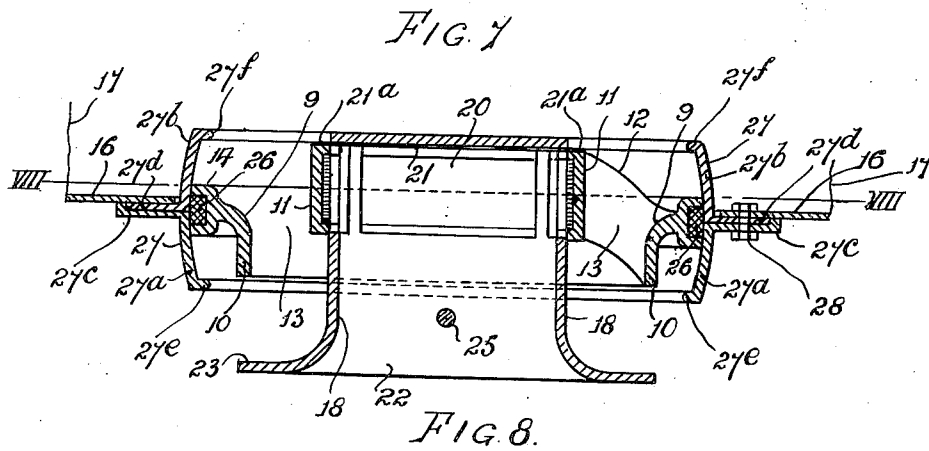
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AIR DIRECTING DEVICE OR NOZZLE FOR USE IN VENTILATING SYSTEMS

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,197,614

AIR DIRECTING DEVICE OR NOZZLE FOR  
USE IN VENTILATING SYSTEMSSydney Hall and Alfred Myers, Ashton-under-  
Lyne, England, assignors to Hall & Kay, Lim-  
ited, Ashton-under-Lyne, EnglandApplication July 6, 1938, Serial No. 217,686  
In Great Britain June 23, 1937

5 Claims. (Cl. 98—40)

This invention has reference to air directing devices or nozzles for use in ventilating systems.

In ventilating systems it is already known to employ an air directing device or nozzle comprising an adjustable member which in one position causes the air to issue into the space or compartment to be ventilated, in the form of a "solid" stream, the direction of which in some cases may be variable, and in another position causes the air to be diffused radially, and in a third position cuts off air.

The main object of the present invention is to provide an air directing device or nozzle by means of which the air can be caused to issue in the form of a "solid" stream, the direction of which may or may not be variable, or in the form of a radial diffusion, or partly in the one form and partly in the other, without, if desired, variation of the quantity of the air issuing from the device or nozzle.

An air directing device or nozzle in accordance with the invention comprises a housing mounted in the wall of an air duct or equivalent to which the air for ventilation is supplied, and provided with a plurality of ports surrounding a tubular member which is adjustably mounted in said housing and provided at its inlet end with inlet ports adapted to be communicated with and cut off from the air duct or equivalent, and at its outlet end with a flared or other external diffusing surface, adapted to co-act with the ports in the housing, the arrangement being such that in one position of the tubular member in the housing, the outlet end of the member closes the ports in the housing and the ports in the inlet end of the member pass into the air duct or equivalent and allow air from the latter to pass into the member from the outlet end of which it issues in the form of a "solid" stream, and in another position of the tubular member in the housing the inlet ports of the member are drawn into the housing and cut off from the air duct or equivalent and the outer end of the member opens the ports in the housing so that air issuing through said ports impinges against the diffusing surface of the member and is diffused radially, while in intermediate positions of the tubular member in the housing air enters the member by way of the ports at its inlet and issues from the member in the form of a "solid" stream, and air also issues from the ports in the housing and is diffused radially by the diffusing surface at the outlet end of the tubular member.

In the accompanying drawings Fig. 1 is an elevation, Fig. 2 is a plan, Fig. 3 is a vertical section, Fig. 4 is an underside plan of Fig. 3, and Figs. 5 and 6 are vertical sections at right angles to Fig. 3 illustrating one embodiment of the invention. Fig. 7 is a vertical section and Fig. 8 is

a plan on the line VIII—VIII in Fig. 7 illustrating another embodiment of the invention. On the drawings and in the following description the reference numerals indicate like parts.

Referring first to Figs. 1 to 6 of the drawings, the device illustrated comprises a housing 9 itself comprising an outer cylindrical portion 10 and an inner cylindrical portion 11 connected to the outer portion 10 by arms 12 which provide a plurality of ports 13 between the two portions. The outer cylindrical portion 10 is formed with an external radial flange 14 by means of which it is secured around an opening 15 in the wall 16 of an air duct 17. In the inner cylindrical portion 11 is slidably mounted a tubular member 18. The inner end 19 of the tubular member 18 is closed and near said end there are formed in the wall of said member ports 20 adapted to establish communication between the air duct 17 and the bore of the member 18 when the latter is pushed inwards and to cut off said communication when the member is drawn outward. The inner end of the tubular member 18 has secured to it a thin plate 21, the ends 21a of which project beyond the member and are adapted when the member is drawn outward to engage the inner end of the inner cylindrical portion 11 to limit the outward movement of the member 18. The outer end 22 of the member 18 is flared and formed with an external flange 23 adapted when said member is pushed inward to seat against the end of the outer cylindrical portion 10 to limit the movement of the member 18 and to also close the exit from the ports 13.

When the tubular member 18 is pushed inward to the maximum extent the flange 23 on its flared outer end 22 seats against the outer end of the outer cylindrical portion 10 of the housing 9 and closes exit from the ports 13 in the housing and the ports 20 in the wall of the tubular member 18 are projected into the air duct 17 as shown in Fig. 3. Air now passes from the duct 17 through the ports 20 into the bore of the member 18 and issues from the outlet end 22 of same in the form of a "solid" stream or jet. When the tubular member 18 is drawn outward to the maximum extent the ports 20 in the wall of the member pass into the inner cylindrical portion 11 of the housing 9 and are cut off from the air duct 17 and at the same time the flange 23 on the flared outer end 22 of the tubular member 18 is moved away from the outer portion 10 of the housing 9 to open the exit from the ports 13 in the latter as shown in Fig. 5. Air now issues from the duct 17 through ports 13 and impinging against the flange 23 on the flared outer end of the tubular member 18 is diffused radially.

In intermediate positions of the tubular member 18 the ports 20 in the latter are partly pro-

jected into the air duct 17 and the flange 23 on the outer end of the member opens the exit from the ports 13, as exemplified in Fig. 6, so that air can pass from the duct 17 by way of the ports 20 into the member and issue therefrom in the form of a "solid" stream, and also by way of the ports 13 and be diffused radially by the flange 23 on the outlet end of the tubular member.

In order that the direction of the "solid" stream of air issuing from the tubular member 18 may be diverted in any direction the member is rotatable in the inner cylindrical portion 11 of the housing 9 and has provided in its outlet end 20 a baffle 24, Figs. 3 and 4, mounted on a transverse pivot 25 and adapted to be thrown over from a normal position shown in full lines, to a position indicated in dotted lines in Fig. 3 in which it directs the air laterally of the axis of the member 18.

In the embodiment of the invention illustrated in Figs. 7 and 8, the flange 14 of the housing 9 instead of being secured to the wall 16 of the air duct 17, is formed with a peripheral groove in which is disposed a packing ring 26, and is mounted in a part spherical mounting 27. The mounting 27 is made in two parts 27a, 27b formed with flanges 27c, 27d secured together and to the wall 16 by bolts 28. The parts 27a, 27b are also formed with internal beads 27e, 27f constituting stops within the limits imposed by which the housing 9 is capable of universal angular adjustment to vary the direction of the air issuing from the tubular member 18. In all other respects the operation of this embodiment of the invention is the same as before described.

In all cases the various parts of the device or nozzle may be so designed that in all adjusted positions of the member 18 the quantity of air admitted through or by the device or nozzle remains constant.

In some cases means may be provided for cutting off the supply of air through or by the device or nozzle. Such means may conveniently take the form of a sleeve valve 29, Figs. 3 and 4, slidably mounted in the tubular member 18 and operable by a finger-piece 29a to close and open the inlet ports 20 of the member. By closing the inlet ports 20 of the tubular member 18 by means of the valve 29 and also closing the ports 13 in the housing 9 by the flange 23 of the flared outer end of the member, the delivery of air can be entirely cut off.

The pivot 25 on which the baffle 24 is mounted, conveniently serves as a means for operating the tubular member 18.

What we claim by our invention and desire to secure by Letters Patent is:

1. An air directing device for use in ventilating systems comprising an outer cylindrical member adapted to be mounted in the wall of an air supply duct, an inner cylindrical member concentrically disposed with respect to the outer cylindrical member, spaced radial arms joining the two cylindrical members and providing air passages between them, and a tubular member slidably disposed in the inner cylindrical member and having its inner end closed and its outer end flanged to seat against the outer end of the outer cylindrical member and having a circumferential series of ports at its inner end, whereby the adjustment of the tubular member controls the passage of air through the annular space between the two cylindrical members and through said ports.

2. An air directing device for use in ventilating systems comprising a spherical mounting adapt-

ed to be connected to an air supply duct, an outer cylindrical members having a complementary spherical part bearing in said mounting for universal movement therein, an inner cylindrical member concentrically disposed with respect to the outer cylindrical member, spaced radial arms joining the two cylindrical members and providing air passages between them, and a tubular member slidably disposed in the inner cylindrical member and having its inner end closed and its outer end flanged to seat against the outer end of the outer cylindrical member and having a circumferential series of ports at its inner end, whereby the adjustment of the tubular member controls the passage of air through the annular space between the two cylindrical members and through said ports.

3. An air directing device for use in ventilating systems comprising an outer cylindrical member adapted to be mounted in the wall of an air supply duct, an inner cylindrical member concentrically disposed with respect to the outer cylindrical member, spaced radial arms joining the two cylindrical members and providing air passages between them, a tubular member slidably disposed in the inner cylindrical member and having its inner end closed and its outer end flanged to seat against the outer end of the outer cylindrical member and having a circumferential series of ports at its inner end, whereby the adjustment of the tubular member controls the passage of air through the annular space between the two cylindrical members and through said ports, and a baffle pivoted on a transverse axis in the tubular member.

4. An air directing device for use in ventilating systems comprising an outer cylindrical member adapted to be mounted in the wall of an air supply duct, an inner cylindrical member concentrically disposed with respect to the outer cylindrical member, spaced radial arms joining the two cylindrical members and providing air passages between them, a tubular member slidably disposed in the inner cylindrical member and having its inner end closed and its outer end flanged to seat against the outer end of the outer cylindrical member and having a circumferential series of ports at its inner end, whereby the adjustment of the tubular member controls the passage of air through the annular space between the two cylindrical members and through said ports, and a sleeve valve in the tubular member in control of the said ports.

5. An air directing device for use in ventilating systems comprising an outer cylindrical member adapted to be mounted in the wall of an air supply duct, an inner cylindrical member concentrically disposed with respect to the outer cylindrical member, spaced radial arms joining the two cylindrical members and providing air passages between them, a tubular member slidably disposed in the inner cylindrical member and having its inner end closed and its outer end flanged to seat against the outer end of the outer cylindrical member and having a circumferential series of ports at its inner end, whereby the adjustment of the tubular member controls the passage of air through the annular space between the two cylindrical members and through said ports, a baffle pivoted on a transverse axis in the tubular member, and a sleeve valve in the tubular member in control of the said ports.