

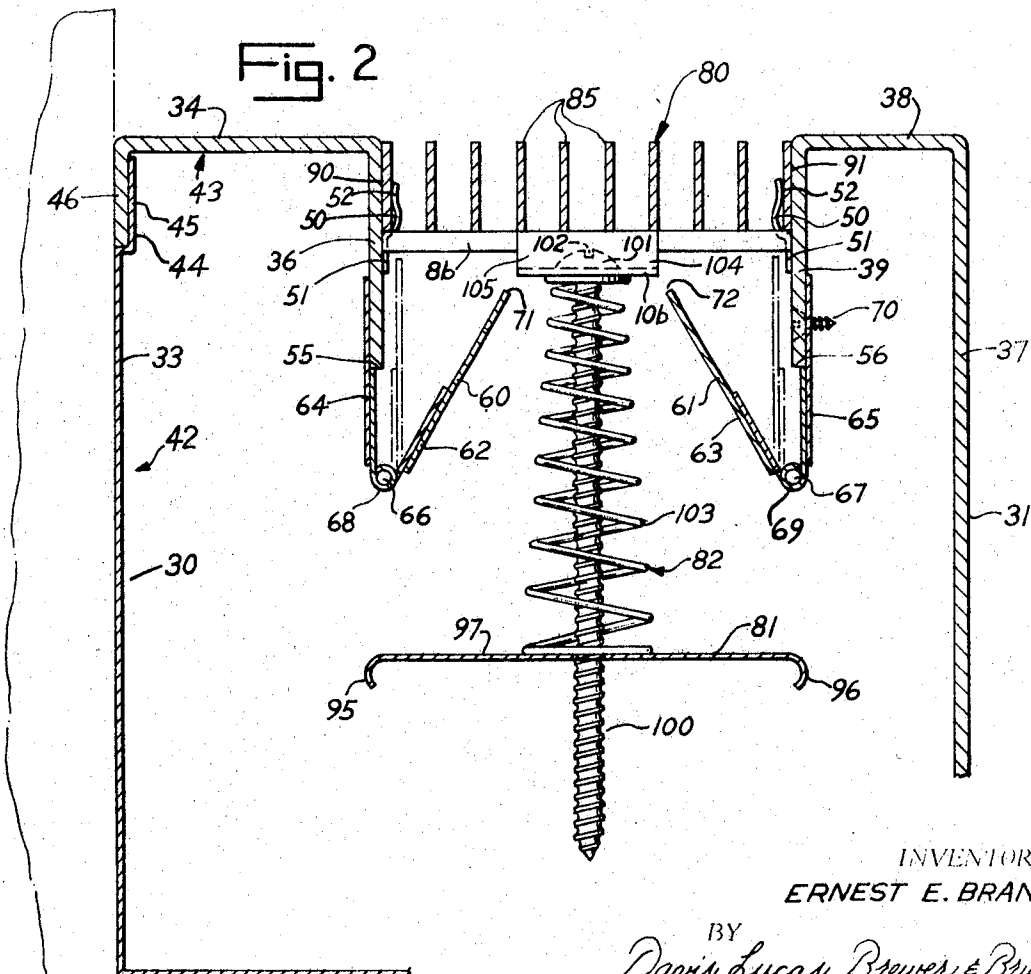
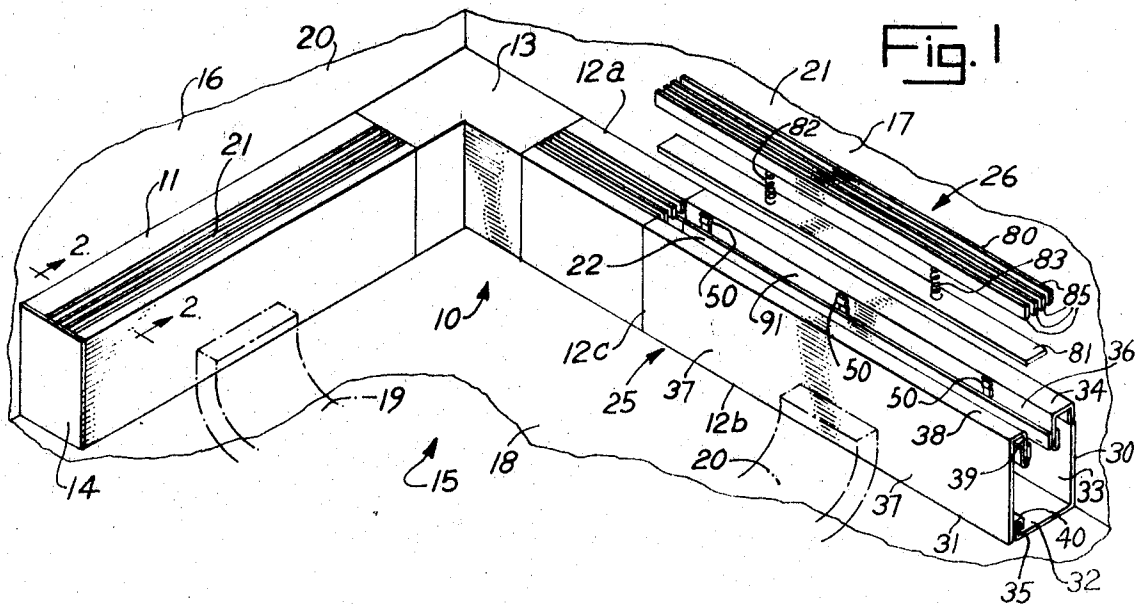
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AIR DISTRIBUTING APPARATUS

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1

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10 Claims

ABSTRACT OF THE DISCLOSURE

An air distributing cabinet formed of cooperating front and back cabinet sections having depending spaced apart flanges along their respective top walls to provide a continuous slot, the back section being selectable from those of different dimensions to determine widths of the cabinet and slot. A grille is fitted between the slot defining depending flanges to direct air flow and to secure portions of the cabinet sections together. A damper extends longitudinally of the cabinet and is supported in juxtaposition with the interior edges of the depending flanges by independent adjusters adjacent the opposite ends of the damper to control the rate and distribution of the air flow through the slot, and an adjustable vane is mounted on each of the depending flanges intermediate the interior edge thereof and the grille to control the velocity and pattern of the air flow at the grille.

BACKGROUND OF THE INVENTION

This invention relates to an elongated baseboard cabinet for conducting a supply of air for discharge along a wall of a room and particularly to an easily assembled cabinet construction for controlling the quantity, velocity and distribution pattern of air discharged therefrom.

Air distributing cabinets of the type to which this invention is directed are generally installed at the floor along the walls of a room, and are provided in lengths and sizes to suit the size and air-conditioning requirements of the room. Air is introduced into the cabinet through a communicating air supply duct connected thereto at the end of the cabinet, or at convenient locations therealong through the floor and into the bottom of the cabinet. Air is discharged from the cabinet through an elongated opening extending along the top of the cabinet, and the flow of air is regulated by an adjustable damper disposed internally of the cabinet. The cabinets are of modular construction utilizing standard lengths which are interconnected at their adjoining ends to form continuous units which may be extended over the full length of a wall, or along selected portions thereof. The modular construction is intended to simplify the ordering and erecting of an air-conditioning system utilizing the air distributing cabinets. Apparatus of the type described is shown in my earlier United States Pat. No. 3,272,109, issued on Sept. 13, 1966.

While the apparatus constructed in accordance with prior art is operable to regulate the quantity of air discharged from the cabinet, no provision is made therein for the regulation of the outlet air velocity throughout the range of regulated air quantity to provide an air discharge pattern and trajectory which will effectively distribute the discharged air throughout the room. Further, the cabinets of the prior art are constructed of a plurality of closely fitting elements which are not interchangeable for use in forming and assembling cabinets of different cross-sectional areas and having different air conducting capacities. As a result, it has been necessary to manufacture and stock numerous closely fitting elements from which individual cabinets are assembled. This procedure has proven to be costly.

2

SUMMARY OF THE INVENTION

My present invention overcomes the problems and shortcomings of the prior art by providing an air distributing cabinet which is simply constructed and assembled from cooperable interchangeable cabinet elements having like depending flanges formed along their respective top portions, and which are releaseably interconnected thereat by an elongated grille; an elongated movable damper is arranged in juxtaposition to and is cooperable with the spaced inner longitudinal edges of the flanges to regulate the quantity of air flowing through the grille, and a pair of elongated vanes which are mounted respectively for swinging movement on the depending flanges toward and away from one another to effect the development of a desired velocity and pattern of the air discharged through the grille.

It is therefore an object of this invention to provide a baseboard air conducting and distributing cabinet which is assembled from elected interchangeable cabinet elements which are firmly interconnected by an associated standard outlet grille.

Another object of this invention is to provide a baseboard air conducting and distributing cabinet having an elongated longitudinal outlet slot defined therein by depending flanges formed on standard front and back cabinet elements, and an elongated grille which is engageable in the slot and retainably interconnects the opposite flanges of the cabinet elements.

This invention further has within its purview the provision of an air conducting and distributing cabinet having an elongated longitudinal outlet slot defined by depending flanges formed on standard front and back elements, and an elongated damper which cooperates with the spaced inner longitudinal edges of the flanges to regulate the flow of air through the slot.

Another object of the invention is to provide a baseboard air conducting and distributing cabinet having an outlet slot defined by depending flanges formed on standard front and back cabinet elements, which flanges are interconnected by a grille, an elongated damper movably supported from said grille and arranged in juxtaposition to the inner edges of the flanges, and including elongated longitudinally extending vane means hingedly attached along the lower portion of each of the depending flanges for effecting regulation of the volume and velocity of air discharge through the grille.

These and other objects and advantages of my present invention will become apparent from the following description and drawings in which:

FIG. 1 is an isometric view in elevation of a plurality of the base board cabinets of this invention installed in the corner of a room, and wherein a portion of one of the cabinets is depicted with parts in an exploded relationship; and

FIG. 2 is an enlarged and fragmentary cross-sectional view of the assembled baseboard cabinet structure shown in FIG. 1.

An exemplary baseboard air distributing structure 10, as shown in FIG. 1, includes three modular baseboard air distributing units 11, 12a and 12b which embody a preferred form of this invention, and has appropriate auxiliary fittings, including a corner unit 13 and an end cap 14. The structure 10 is shown installed in the place normally occupied by a baseboard in a typical room 15 to provide a substantially uniform dissemination of conditioned air along the intersecting walls 16 and 17 from adjacent the floor 18 thereof. Conditioned air is introduced under pressure into the structure 10 at intermediate locations therealong through air supply ducts 19 and 20, and is discharged therefrom through slots 21 and 22 in the tops of the units 11 and 12a and 12b respectively.

The baseboard air distributing units **11**, **12a** and **12b** are alike, except in length, and may be assembled of abutted and adjoined parts of appropriate lengths. For this reason the detailed structure of only one unit **12b**, will be particularly described, and for such description, reference is made to both FIG. 1 and FIG. 2.

Referring first to the exploded view illustrated in FIG. 1, it may be observed that unit **12b** is formed generally by two sub-assemblies, namely, an elongated cabinet **25** and an associated damper-grille unit **26**, each of which will be more fully described herein. The cabinet **25** is made up of a back section **30** and a front section **31**, both of which are formed of suitable sheet material, such as steel, aluminum or one of numerous plastic materials. The back section **30** has a generally J-shaped transverse cross section defined by a bottom portion **32**, back portion **33** and top portion **34**. In addition, an outer marginal segment of the bottom portion **32** extends upwardly to serve as a tongue **35** which receives and interconnects the front section **31** with the back section **30**. The outer margin of the top portion **34** is turned downwardly to form a flange **36** which defines one wall of the slot **22** in the top of the unit **12b**.

The front section **31** includes a front panel portion **37** and a top portion **38**. The margin of the top portion **38** is turned downwardly to form a flange **39** which in the assembly shown, is in spaced and opposed relationship to the other wall of the slot **22**. A continuous retaining clip **40** is attached to the bottom margin of the inner surface of the front panel portion **37** to define a continuous slot which, in the assembly, releasably receives the tongue **35** of the back section **30** to retain the front section **31** in place thereon. The tongue and slot means is one suitable manner of providing a separable and easily assembled connection between the back section **31** and the front section **30**.

It may be noted that in the structure disclosed, the back section **30** is not formed of one continuous sheet, but includes a lower segment **42** and a mating top segment **43** which are releasably interconnected along a longitudinal seam **44** in the back portion **33**. The seam **44** is formed by providing an offset lip **45** in the upper margin of the lower segment **42** to receive a corresponding downwardly turned tongue **46** of the top segment **43**. The overlapping lip **45** defines a groove with respect to wall **21** and into which tongue **46** is slipped to rigidly support and position the top segment **43**. In the described construction of the back section **30**, lower segment **42** may be formed of a lighter weight sheet metal, and like front section **31**, is formed to a standard configuration, while the dimensions of top segment **43** may be varied to define multiple slot widths.

A plurality of like clip members **50** are attached to the flanges **36** and **39** at opposite facing positions spaced longitudinally therealong, although as illustrated at FIG. 1, only the clips **50** attached to the downturned flange **36** are visible. Each of the clips **50** is formed of a resilient material, such as metal, and includes a base portion **51** and an integral upwardly extending tongue **52**. The clips **50** are attached to the downturned flanges **36** and **39** at their base portions **51** by appropriate means, such as, for example, spot-welding. The clips **50** are disposed a common distance below the top portions **34** and **38** of the back and front sections **30** and **31** respectively, and are arranged to grip appropriate outer bars of the damper grille unit **26** to secure it in place in the assembly. The damper grille unit **26** serves as a bridging means for interconnecting the front and back sections **31** and **30** along their spaced apart upper flanges.

Having reference to FIG. 2, as formerly described, the downwardly turned flanges **36** and **39** are spaced apart and define the continuous slot **22** in the top of the cabinet **25** and provide an air passageway therebetween. The downturned flanges **36** and **39** extend into the interior of the cabinet **25** and terminate at inner edges **55** and **56** re-

spectively which are parallel to one another and to the floor portion **32**. It may be appreciated that it is desirable to provide cabinets having different widths of slot openings in order to satisfy air conditioning requirements for different volumes of air per linear increment of the baseboard air distributing units. For example, in an air conditioning system to serve a room having a moderate heating or cooling load, but in which it is desirable to supply air along the entire perimeter of the room, it is desirable to provide a cabinet having a narrow slot. On the other hand, in a room having a heavy heating or cooling load, and in which there is available only a small portion of the room in which to install baseboard air distributing units, a cabinet having a wide slot will be required. The versatile baseboard air distributing units of this invention satisfy this need for a plurality of slot widths by employing standard front sections and a plurality of cooperating back top segments in each of which the downturned flange is spaced a different distance from the back panel portion thereof. Thus, for example, for a cabinet of a given cross-sectional dimension, multiple slot widths can be utilized to satisfy air conditioning requirements in a variety of installations with the disclosed structure, it is only necessary to construct and stock standard front sections, standard lower back segments and multiple back top segments to accommodate multiple grille units. Thus, manufacture is simplified and inventories are kept to a minimum for maintaining a sufficiently wide selection of baseboard units to satisfy diverse air conditioning requirements.

In addition to the variations of grille units afforded by the disclosed structure, a pair of hinged vanes **60** and **61** are provided in the slot **22** to regulatably constrict the air passageway and control air flow velocity between the opposed walls of the flanges **36** and **39**. The vanes **60** and **61** each constitute one blade of a pair of like hinges **62** and **63** respectively, and are of the general nature of the so-called piano hinges. Other blades **64** and **65** of the hinges **62** and **63** respectively are connected to the vanes **60** and **61** by hinge pins **66** and **67** so that the vanes **60** and **61** are swingable relative thereto to adjusted positions. As shown in FIG. 2, the hinges **62** and **63** are arranged with their hinge pins **66** and **67** below and extending along the free edges **55** and **56** of the flanges **36** and **39** respectively, and so that surfaces **68** and **69** of the hinges **62** and **63** form spaced parallel edges which extend the length of the flanges **36** and **39** to define the throat of the slot **22**. The blade **64** of the hinge **62** and the blade **65** of the hinge **63** are fastened to the lower margin of the flanges **36** and **39** respectively by means such as a plurality of sheet metal screws **70**, or by spot-welding. The vanes **60** and **61** being thus disposed, are swingable from position substantially parallel to their associated flanges **36** and **39** to various positions of angularity with respect thereto. Movement of the vanes **60** and **61** away from their associated flanges **36** and **39** operates to move their outer edges **71** and **72** toward one another, thereby effectively to constrict the air passageway through which conditioned air is disseminated from the cabinet **25**.

In the form disclosed, the damper-grille unit **26** comprises an elongated grille **80**, an elongated damper **81** and a pair of adjustable damper supports **82** and **83** which extend laterally of the grille and support the damper for adjustable spacing relative to the surfaces **68** and **69** of the hinged vanes. The grille **80** has a plurality of parallel longitudinally extending baffle strips **85** arranged with their flat faces in opposed and spaced relationship. The baffle strips are supported relative to one another and joined by spaced crossbars **86** to which the baffle strips **85** are attached, as by welding. The grilles, of which grille **80** is representative, are constructed in predetermined standard widths to fit into the hereinbefore described different widths of slots provided by the selectively constructable cabinet disclosed herein. The outer bars **85** of

5

the grille 80 are laterally spaced apart a distance approximating the length of the bridge members 86, and are arranged for surface engagement with the respective inner surfaces 90 and 91 of the flanges 36 and 39 respectively. As previously described the clips 50 are secured to the flanges 36 and 39 at their inner surfaces 90 and 91 at the top portion of the cabinet 25. The outer bars 85 are received by the clips 50 and are pressed against the corresponding flanges 36 and 39 to hold the grilles in place with the upper edges of the bars 85 at the general level of the top portions 34 and 38 of 25.

The bars 85 are effective, as baffles, to direct the air flow of the air discharged through the grille 80.

The damper 81 is an elongated plate having downwardly turned flanges 95 and 96 along its opposite longitudinal margins to provide rigidity and to maintain the upper surface 97 of the damper 81 in a substantially planar condition. The upper surface 97 of the damper 81 has a width slightly greater than the lateral distance between the outer surfaces 68 and 69 of the hinges 62 and 63, so that when the damper 81 is brought into abutting engagement thereagainst, the slot 22 is substantially closed. When the damper 81 is in a position spaced away from the throat of the slot 22, as defined by the outer surfaces 68 and 69, the longitudinally extending openings at either side of the damper 81 between the upper surface 97 thereof and the corresponding adjacent outer surfaces 68 and 69 provide dual passageways for air flow into the slot 22. Varying the vertical extent of these dual openings by movement of the damper 81 toward and away from the throat of the slot 22, serves to change the volume of conditioned air disseminated through the slot 22 from within the cabinet 25. Consistent with the versatile character of the disclosed structure, the damper 81, like the grille 80, is provided in widths which correspond to the various slot widths for which the cabinets are adapted to use.

The adjustable damper supports 82 and 83 are of like construction and only one will be described. As shown at FIG. 2, the adjustable damper support 82 comprises screw 100 of suitable length having a head 101 provided with a screwdriver slot 102 exposed between grille bars 85, a compression spring 103 and a mounting bracket 104. The mounting bracket 104 comprises an angle member having flange portion 105 which is secured, as by welding to an appropriate bridge member 86, and a substantially horizontal portion 106. The screw 100 extends through an opening in the horizontal portion 106 of the mounting bracket 104 with the undersurface of the head bearing thereagainst. One such mounting bracket is attached to a bridge member 86 generally centrally of the grille 80 and adjacent each of its opposite longitudinal ends. The damper 81 is provided with like threaded openings at locations conforming in spacing to those through the two mounting brackets 104 to receive the threaded shank portions of the screw 100. The spring 103 of this embodiment is provided with flattening segments at its opposite longitudinal ends which are arranged to bear respectively against the undersurface of the horizontal portion of the mounting bracket 104 and the upper surface of the damper 81. The springs 103 thus serve to urge the head of each of the screws 100 into bearing engagement with the upper surface of the respective mounting brackets 104, and to maintain this engagement as the damper 81 is moved toward and away from the throat of the air flow slot in response to rotative movement of the screws 100. However, it will be readily appreciated that the threaded interconnection between the grille 80 and the damper 81 may be accomplished by numerous well-known threaded connectors.

The use of adjustable damper supports which are disposed at opposite ends of the damper 81, permits the damper 81 to be canted longitudinally with respect to the throat of the slot 22, while maintaining lateral stability of the damper. It may be noted that the limited length of

6

threaded interconnection between the respective screws 100 and the damper 81 permits a degree of non-perpendicularity therebetween, and that the respective springs 103 will yield sufficiently to accommodate end-to-end slope of the damper relative to the throat. The valving effect of the damper 81 may be varied by screw adjustments of the adjustable damper supports 82 and 83. Compensation can also be made for an air pressure drop along the longitudinal extent of the unit 126 to maintain a relatively uniform or desired discharge of air along the length of the grille 80.

From the foregoing description, taken in conjunction with the accompanying drawings, it may be understood that the baseboard air distributing structure 10 comprises associated sub-assemblies which are modular in character and are arranged for cooperative interengagement and operation. The structural units are readily made to provide for a plurality of slot widths to satisfy different air supply requirements, and are adapted to be preselected and set up at the time of installation to meet specific requirements.

After assembly into a complete structure 10, to which a suitable supply of conditioned air is introduced, the baseboard air distributing unit is readily adjusted to disseminate a desired volume and discharge pattern of conditioned air into the room 11. The volume, distribution and pattern (or trajectory) adjustments are accomplished manually by moving the damper 81 and the vanes 60 and 61 to appropriate positions with the volume being controlled by both the damper and vanes and the trajectory of dissemination controlled principally by the vanes. It may also be understood that the damper 81 serves to regulate not only the total volume of flow of conditioned air, but by being canted longitudinally of the structure, serves to regulate the distribution of the flow with respect to the length of the unit. The vanes 60 and 61 influence the rate and pattern of flow of air therebetween and through the grille.

I claim:

1. Apparatus for the dissemination of conditioned air into a room and comprising in combination: an elongated air-disseminating cabinet having an inlet opening for communication with a conditioned air supply conduit and having a discharge opening for communication with the room in which said apparatus is disposed, said discharge opening in the cabinet being an elongated slot defined by a pair of spaced and opposed flanges which extend into the cabinet along substantially the full length thereof, said flanges being in substantially parallel relationship to one another and defining an air passageway therebetween; elongated bridge means extending substantially the length of said discharge opening and providing an interconnection between said pair of flanges for maintaining the spaced relationship therebetween over the length thereof and having air flow passages therein through which air is disseminated from the cabinet; and first air flow regulating means disposed internally of said cabinet for controlling the volume of air flow through said discharge opening, said first air regulating means comprising an elongated damper member arranged in juxtaposition with inner portions of said flanges, said damper member being movable toward and away from said inner flange portions between a closed position thereagainst in which said damper member closes the passage to the flow of air through said slot and an open position spaced a distance away from said inner flange portions in which the restrictive effect of said damper to the passage of air through said discharge opening is reduced, and adjustable damper supports interconnecting said bridging means and said damper member for supporting and selectively positioning said damper member, said cabinet comprising a back panel part of substantially L-shaped section having one of said pair of flanges at the top thereof, and an associated front panel part having the other of said pair of flanges at the top thereof, and means releasably interconnecting said back and front panel parts along the

7

lower regions thereof, said front panel part being composed of segments of fixed sectional dimensions, and said said back panel part being one selected from a plurality having sectional dimensions selectively related to those of said bridging means to provide different discharge openings providing different air-disseminating capacities.

2. The invention of claim 1, wherein said front panel part is a standard element and said back panel part is one selected to provide different spacing between the flanges thereof, and said bridging means is selected from a plurality of associated bridging means each of which corresponds to one of the said different spacings.

3. The invention of claim 2, wherein said back panel comprises a lower segment and a connectable top segment having said one of said pair of flanges, said top segment being selected from a plurality of top segments having sectional dimensions arranged to provide different spacing between said pair of flanges.

4. The invention of claim 3, wherein said bridging means comprises an elongated grille, said grille being removably secured between said pair of flanges by clip means on said flanges, said grille also having a plurality of like baffle strips extending longitudinally of said cabinet and which are supported in spaced relationship by a plurality of longitudinally spaced crossbars, said clip means slidably gripping outer baffle strips of said grille to secure the grille in place in the cabinet assembly.

5. The invention of claim 4 wherein said adjustable damper is secured to said grille and extends downwardly therefrom between said flanges.

6. Apparatus for the dissemination of conditioned air into a room and comprising in combination: an elongated air-disseminating cabinet having an inlet opening for communication with a conditioned air supply conduit and having a discharge opening for communication with the room in which said apparatus is disposed, said discharge opening in the cabinet being an elongated slot defined by a pair of spaced and opposed flanges which extend into the cabinet along substantially the full length thereof, said flanges being in substantially parallel relationship to one another and defining an air passageway therebetween; elongated bridge means extending substantially the length of said discharge opening and providing an interconnection between said pair of flanges for maintaining the spaced relationship therebetween over the length thereof and having air flow passages therein through which air is disseminated from the cabinet; and first air flow regulating means disposed internally of said cabinet for controlling the volume of air flow through said discharge opening, said first air regulating means comprising an elongated damper member arranged in juxtaposition with inner portions of said flanges, said damper member being movable toward and away from said inner flange portions between a closed position thereagainst in which said damper member closes the passage to the flow of air through said slot and an open position spaced a distance away from said inner flange portions in which the restrictive effect of said damper to the passage of air through said discharge opening is reduced, and adjustable damper supports interconnecting said bridging means and said damper member for supporting and selectively positioning said adjustable damper supports comprising a pair of screws extending into said cabinet and disposed inwardly of the longitudinal ends of said bridge means with heads exposed in said discharge opening, each of said screws having a threaded shank of a length substantially greater than the depth of said

8

flanges, means supporting said screws for rotation at fixed positions relative to said flanges and connecting said damper member to said screws for movement toward and from said flanges in response to rotation of the screws.

7. The invention of claim 6 and further characterized by a compression spring disposed between said means for supporting the screws and said damper member.

8. Apparatus for the dissemination of conditioned air into a room and comprising in combination: an elongated air-disseminating cabinet having an inlet opening for communication with a conditioned air supply conduit and having a discharge opening for communication with the room in which said apparatus is disposed, said discharge opening in the cabinet being an elongated slot defined by a pair of spaced and opposed flanges which extend into the cabinet along substantially the full length thereof, said flanges being in substantially parallel relationship to one another and defining an air passageway therebetween; elongated bridge means extending substantially the length of said discharge opening and providing an interconnection between said pair of flanges for maintaining the spaced relationship therebetween over the length thereof and having air flow passages therein through which air is disseminated from the cabinet; and first air flow regulating means disposed internally of said cabinet for controlling the volume of air flow through said discharge opening, said first air regulating means comprising an elongated damper member arranged in juxtaposition with inner portions of said flanges, said damper member being movable toward and away from said inner flange portions between a closed position thereagainst in which said damper member closes the passage to the flow of air through said slot and an open position spaced a distance away from said inner flange portions in which the restrictive effect of said damper to the passage of air through said discharge opening is reduced, and adjustable damper supports interconnecting said bridging means and said damper member for supporting and selectively positioning said damper member, second air regulating means interiorly of said air passageway for adjusting the velocity and pattern of the air emitted through said discharge opening, said second air regulating means comprising movable vane means between said flanges for constricting the width of said air passageway.

9. The invention of claim 8 wherein said vane means is attached to one of said pair of flanges adjacent the inner edge thereof by hinge means and movable between positions of angularity with respect to said flanges.

10. The invention of claim 9 wherein there is provided a second vane means which is hingedly attached to the other of said pair of flanges.

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U.S. Cl. X.R.

98—40

Disclaimer

3,515,052.—*Ernest E. Brandes*, Madison, Wis. AIR DISTRIBUTING APPARATUS. Patent dated June 2, 1970. Disclaimer filed Oct. 13, 1971, by the inventor.

Hereby enters this disclaimer to claims 1 to 10 of said patent.
[*Official Gazette December 21, 1971.*]