April 2, 1963 E. E. BRANDES 3,083,632

HEAT DISPERSING STRUCTURE

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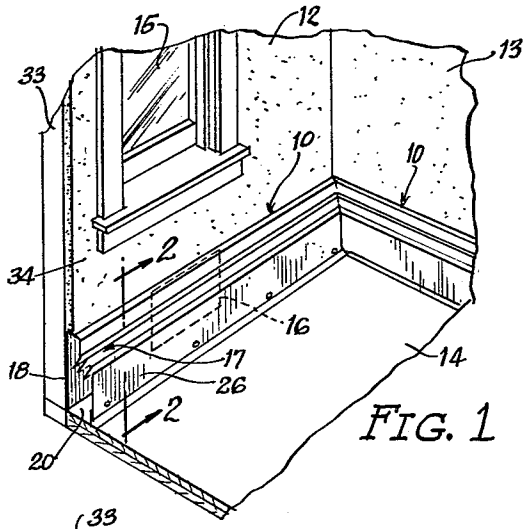


FIG. 1

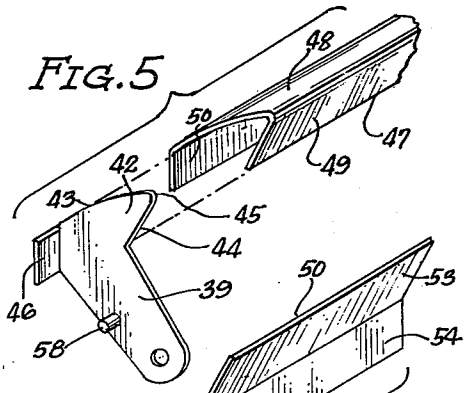


FIG. 5

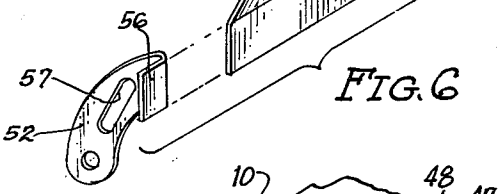


FIG. 6

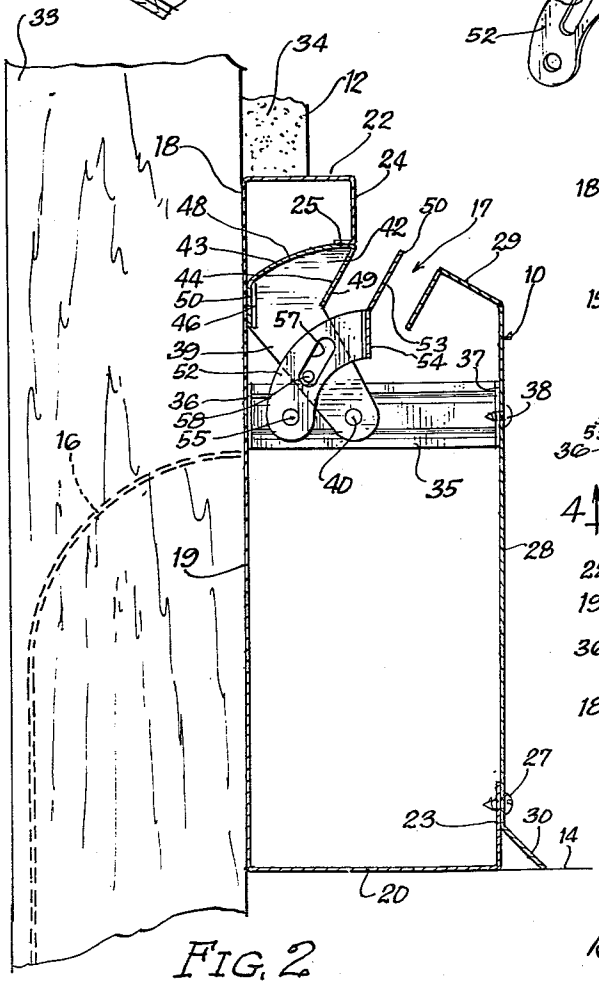


FIG. 2

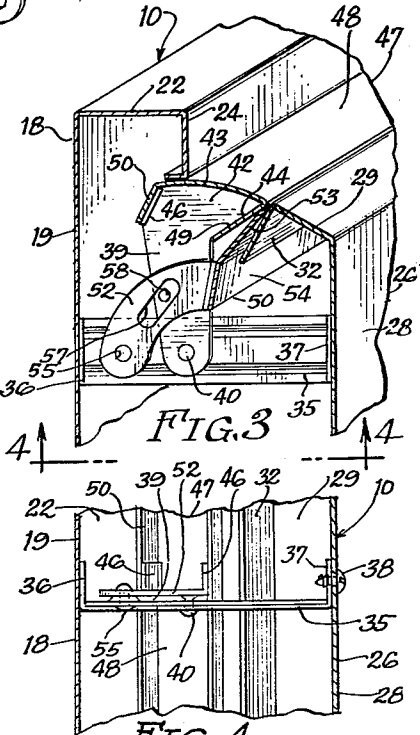


FIG. 3

FIG. 4

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HEAT DISPERSING STRUCTURE

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This invention relates to a heat dispersing structure, and more particularly to such a structure adapted to the distribution and dissemination of conditioned air from a position along the bases of walls of a room.

One of the objects of this invention is to provide a heat dispersing structure adapted to mounting at the base of a wall of a room for effecting dissemination of air fed thereto through a conduit and which heat dispersing structure not only embodies movable means for adjusting the size of the opening through which air is discharged therefrom, but also has air directing surfaces which are movable relative to one another as the movable means is adjusted to provide effective control of the direction of the discharge of air from the structure.

Another object of my invention is to provide a heat dispersing structure having an air discharge opening extending longitudinally of the top portion of the structure, which discharge opening is defined on opposite sides by substantially flat air directing surfaces, one of which is movable toward and from the other for regulating the air flow space between the surfaces, and there being an additional movable vane between the surfaces further serving to direct the flow of air from the structure.

My invention also has within its purview the provision of a heat dispersing structure embodying a movable element for varying the width of an air discharge passage through which air is disseminated from the structure and also a movable air directing vane extending along the passage with means providing a connection between the movable element and movable vane for effecting movements of the vane to positions related to those of the movable element.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings in which similar characters of reference indicate similar parts throughout the several views.

FIG. 1 is a fragmentary perspective view of the interior of a room in which a preferred embodiment of this invention is illustrated;

FIG. 2 is an end section view drawn to a larger scale than FIG. 1 and showing internal structure of my preferred heat dispersing unit, the view being taken substantially as indicated by a line 2—2 and accompanying arrows in FIG. 1;

FIG. 3 is a fragmentary perspective view with parts shown in section and wherein movable elements of the structure are in different positions than those shown in FIG. 2;

FIG. 4 is a fragmentary bottom sectional view taken substantially as indicated by a line 4—4 and accompanying arrows in FIG. 3; and

FIGS. 5 and 6 are exploded views which each show elements of movable parts of the heat dispersing structure illustrated in FIGS. 2 and 3.

As illustrated in FIG. 1, a heat dispersing structure 10 which comprises the subject matter of this invention and an exemplary embodiment of which is shown in detail herein for illustrative purposes is adapted to mounting along the base portions of walls, such as 12 and 13 and rests against a floor 14 of the room. The wall 12 of the illustrated building is an outside wall including a window 15, while the wall 13 may be an inside wall of the building. Ordinarily the even and uniform heating of a room requires the dispersion of different amounts of heat along outside and inside walls, and often it is desirable to increase the heat dispersion in the vicinity of a window.

Thus, it is desirable that a heat dispersing structure of the type herein disclosed shall be adjustable to effect the desired and required amount of heat dispersion along various portions of walls and along both inside and outside walls of a building. For optimum comfort within a room, it is also desirable that the air dispersed from a structure such as that herein illustrated shall be directed upwardly and outwardly into a room with some velocity. At selected positions along the heat dispersing structure 10, conditioned air is supplied thereto by conduits 16, from which supply conduits, the heat dispersing structure carries the conditioned air along its length and effects its dispersion through a heat dispersing slot 17.

Considering the heat dispersing structure in greater detail, in the illustrative form depicted in FIGS. 2 to 6 inclusive, it includes a back part 18 which, in the present instance, embodies a back wall portion 19, a bottom portion 20 and a top flange portion 22, which portions, in the illustrated embodiment, are integrally formed from a single strip of sheet metal of a desired length. The bottom portion 20 extends forwardly from the back wall portion 19 in substantially right angular relationship thereto, and the top flange portion 22 extends forwardly from the back wall portion at the top thereof and in opposed relationship to the bottom. In the illustrated structure, a front flange 23 extends upwardly at the front of the bottom portion 20 and is integrally formed thereon. Also, the top flange portion 22 has thereon a downwardly projecting flange 24, along the bottom of which there is integrally formed a narrow rearwardly projecting flange 25.

A front part 26 is secured to the front flange 23 on the bottom portion 20 of the back part 18 by fastening means such as sheet metal screws 27 and includes a front wall portion 28, at the top of which there is an upwardly and rearwardly projecting flange 29, and at the bottom of which there is an outwardly and downwardly projecting flange 30. Integrally formed with the top flange 29 on the front wall portion there is a second flange 32 which extends downwardly and into the heat dispersing structure to provide a generally flat air guiding surface which extends upwardly and forwardly with respect to the heat dispersing structure along the front side of the heat dispersing slot 17. The flange 30 at the bottom of the front wall portion extends downwardly and outwardly for engagement wtih the floor 14 to facilitate cleaning along the front of the structure.

The back part 18 of the heat dispersing structure is adapted to be secured to the wall structure of a building in which it is utilized, such as to studs 33, as well as to the floor 14. When thus mounted, either plaster 34 or a dry wall panel may abut the upper surface of the top flange portion 22 on the back wall 18.

Internally of the heat dispersing structure 10 and at spaced positions longitudinally of the structure, brace members 35 are secured to the back wall portion 19 of the back part, preferably somewhat above the mid-portion thereof, as by having a flange 36 spot welded to the back wall portion, and extend forwardly from the back wall portion to serve as supports for the upper portion of the front wall portion 28. In the illustrated structure, the front wall portion is secured to a flange 37 on each of the brace members 35 by fastening means such as sheet metal screws 38. Each of the brace members 35 has an arm 39 secured thereto for rotational swinging movement by fastening means, such as a rivet 40, and extends upwardly from the brace member. As herein depicted, an integral projection is provided at the upper end of each of the arms 39 and extends forwardly therefrom. An upper end surface or edge 43 on each of the arms 39 is arcuately curved and is concentric to the axis of the rivet 40 about which the arm is adapted to swing. Also, a forward edge 44

on the projection 42 of each arm is substantially straight and adjoins the arcuate surface 43 through a curve 45 of short radius, so that the relatively straight edge 44 and arcuate edge 43 are disposed in substantially acute angular relationship to one another. At the upper rear portions of the arms 39, integral tabs 46 are provided at positions opposite the projections 42 and project in substantially right angular relationship from one of the side surfaces of the arms.

A formed sheet metal strip 47 has a sectional shape providing an arcuately curved portion 48, a substantially flat front flange portion 49 and a substantially flat rear flange portion 50, the inner surfaces of which fit over the ends of the arms 39 with the front flange 49 engaging the edges 44 of the arms, the arcuately curved surface 48 engaging the arcuately curved end edges of the arms and the flat rear flange engaging the rear surfaces of the tabs 46 on the arms. The rear flange 50 on the formed sheet metal strip 47 is secured to the tab 46 on each of the arms by means such as spot welding, so that when thus held in place with the curved surface portion and front flange gripping the edges 43 and 44 of the projecting portions of the arms, the formed sheet metal strip is supported for swinging movement with the arms and extends longitudinally of the back part 18 of the structure. As shown in FIGS. 2 and 3, the outer arcuately curved surface of the formed sheet metal strip engages the surface of the rearwardly projecting flange 25 on the back part 18 to form a closed joint between the back part 18 and the formed sheet metal strip 47 along the full length of the structure and regardless of the position to which the arms 39 are swung relative to the support 35. In the structure illustrated, the flange 49 on the formed sheet metal strip 47 and the flange 32 on the front part 26 are in substantially parallel and opposed relationship to one another when rear flange 50 of the formed sheet metal strip engages the inner surface of the back wall portion 19 of the structure, thereby to define the full width of the heat dispersing slot 17 when it is fully open and to provide upwardly and forwardly sloping surfaces on opposite sides of the heat dispersing slot to serve as guides for the flow of air outwardly from the structure through the slot. Also, when fully open, the front flange 49 on the formed sheet metal strip desirably extends to substantially flush relationship to the flange 24 on the back part 18. As shown in FIG. 3, the arms 39 are swingable to positions in which the formed sheet metal strip 47 contacts the flange 32 on the front part and in which the arcuately curved surface 48 of the strip is in generally flush relationship to the outer surface of the flange 29 on the front part.

To provide additional air guiding and directing surfaces between the flanges 32 and 49 on opposite sides of the heat dispersing slot, when desired, a formed sheet metal vane 50 is supported by arms 52 from the base members 35 for movements to various positions between the flanges 32 and 49. The vane 50 is a strip-type member having a section providing portions 53 and 54 in obtuse angular relationship to one another. In the form disclosed, each of the arms 52 is a sheet metal element having curved edges extending from end to end. The lower end of each of the arms 52 is mounted for swinging movement on the brace member 35 by fastening means such as a rivet 55 spaced rearwardly of the structure from the rivets which support the arms 39. The arms 39 and 52 have adjacent surfaces which cross one another, and at their upper ends, the arms 52 are provided with angularly disposed flanges 56 to which the portion 54 of the vane 50 is secured, as by spot welding. When thus supported from the arms 52, the portion 53 of the vane extends upwardly between the flanges 32 and 49 with its opposite surfaces in substantially opposed relationship to those flanges.

In order to effect movements of the portion 53 of the vane which keep it in the mid-region of the slot 17 between the flanges 32 and 49 as the width of the slot is varied by movements of the formed sheet metal strip 47 and its supporting arms 39, arms 52 have elongated slots 57 therein through which pins secured to and projecting from the surfaces of the adjacent arms 39 extend. As the arms 39 swing toward and from the flange 32 on the front part 26, the pins 58 on the arms 39 move along the slots 57 in the arms 52 to effect movements of the arms 52 which correspond to those of the arms 39, as a result of the cam action of the pins against the side surfaces of the slots through which they extend. In the disclosed structure, the portion 53 of the vane 50 is kept in the mid-region of the slot 17 as the overall slot width is adjusted, thereby to provide additional air guiding surfaces between the flanges 32 and 49 on the front and rear parts respectively. By comparing the positions of the parts in FIGS. 2 and 3, it may be observed that the portion 53 of the vane 50 is between and in substantially parallel relationship to the surfaces of the flanges 32 and 49 when the slot 17 is fully open, while angularity develops to narrow the heat dispersing slot more near the exterior than at the interior thereof when the heat dispersing slot approaches its closed position. This affords some nozzle action as the heat dispersing slot approaches its closed position.

From the foregoing description and by reference to the accompanying drawings, it may be observed that I have provided a heat dispersing structure in which a heat dispersing slot at the top of the structure is readily adjustable in width along the structure and which incorporates relatively movable flat surfaces which guide and direct the flow of air from the heat dispersing structure in an upward and outward direction from the structure whether the heat dispersing slot is wide open or adjusted to a narrower width by movements of the movable slot adjusting parts.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A heat dispersing structure for mounting along the base of a wall and comprising, in combination, a back part integrally formed of sheet metal and including a back wall and a bottom in substantially right angular relationship to one another, said bottom having an upwardly projecting flange along the front edge thereof in spaced and opposed relationship to the back wall, said back wall having flange means extending forwardly at the top thereof in spaced and opposed relationship to the bottom, a front part secured to said upwardly projecting flange on the bottom and including a front panel portion having flange means at the top thereof extending toward the back wall and presenting an air directing surface in spaced and opposed relationship to the flange means on the back part, brace means secured to and extending between the upper portions of the back wall and the front panel portion at positions spaced longitudinally of the parts, arms each having one end movably secured to one of said brace means for swinging movements toward and from the front and back parts and extending upwardly from the brace means, said arms having edge surfaces at positions remote from said brace means and one of which is adjacent said flange means on the back wall and the other of which surfaces is in opposed relationship to said air directing surface on the flange means of the front panel portion, a formed sheet metal strip mounted against said edge surfaces and secured to said arms and extending longitudinally of the structure to provide means movable with the arms for varying the width of the space between the flange means on the front panel and back wall and also providing an air directing surface, and additional means movably mounted on said brace means and providing a movable air directing baffle between said air directing surfaces.

2. A heat dispersing structure as defined in claim 1, and wherein said additional means comprises additional arms each having one end movably secured to one of said brace means in spaced relationship to the first mentioned arms and extending upwardly from the brace means, said

additional arms having means thereon providing surfaces disposed between said air directing surfaces, and a metal strip secured to the last mentioned means and extending longitudinally of the structure to provide air directing surfaces between those aforementioned.

3. A heat dispersing structure as defined in claim 2, and further characterized by means providing a moving connection between the first mentioned and additional arms on said brace means for effecting related movements thereof.

4. A heat dispersing structure comprising, in combination, front, bottom and back wall portions and top flange portions made of sheet metal and adjoined together to define a conduit of selected length and predetermined sectional shape having a heat dispersing slot extending longitudinally thereof between said top flange portions, support means within said conduit below said heat dispersing slot, a plurality of arms mounted on said support means in separated and aligned relationship longitudinally of the conduit, said arms being mounted for swinging movements laterally of said heat dispersing slot, strip means secured to said arms and extending longitudinally of said heat dispersing slot and movable with said arms for varying the effective width of the heat dispersing slot, and additional arms movably mounted on said support means in spaced and aligned relationship to one another longitudinally of the heat dispersing structure, and an air directing vane secured to said additional arms and movable therewith in said heat dispersing slot and relative to said strip means.

5. In a heat dispersing structure, the combination comprising parts having surfaces in spaced and generally parallel relationship to one another and defining therebetween a heat dispersing slot through which air is disseminated from the structure, support means secured within the structure at spaced positions longitudinally of said slot, arms mounted on said support means at aligned positions longitudinally of the slot and each having an end portion movable laterally of the slot, a formed sheet metal element having curved and flat surfaces extending longitudinally of the slot in angular relationship to one another and secured to said end portions of the arms with the curved surface adjacent the slot defining surface of one of said parts and said flat surface in opposed relationship

to the slot defining surface of the other of said parts, said formed sheet metal element being movable with said arms to change the effective width of the slot, additional arms movably mounted on the support means adjacent the first mentioned arms and in aligned relationship to one another longitudinally of the heat dispersing slot, an air guiding vane secured to said additional arms and extending longitudinally of the heat dispersing slot in opposed relationship to said flat surface of the formed sheet metal element, and said first mentioned and additional arms being movable relative to one another laterally of the heat dispersing slot to space the vane in the lateral mid-region of the slot.

6. In a heat dispersing structure, the combination comprising parts having surfaces defining a heat dispersing slot extending longitudinally of the structure, one of said surfaces being stationary and generally flat and disposed to guide air flowing from the structure, means providing a second generally flat surface in opposed relationship to that aforementioned and a support with which said second surface is movable toward and from the stationary surface to vary the effective width of the heat dispersing slot, means providing an air guiding vane between the stationary and movable surfaces and a support for said vane movable to positions between the stationary and movable surfaces, and means providing a moving connection between the first and second mentioned means for varying the spacing between said air guiding vane and said stationary surface in relation to the position of said second generally flat surface.

7. A heat dispersing structure as defined in claim 4, and further characterized by cam means providing a moving connection between the first mentioned arms and said additional arms.

8. In a heat dispersing structure as defined in claim 5, the combination being further characterized by cam means providing a movable connection between the first mentioned and additional arms for effecting correlated movements thereof.

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