

June 22, 1965

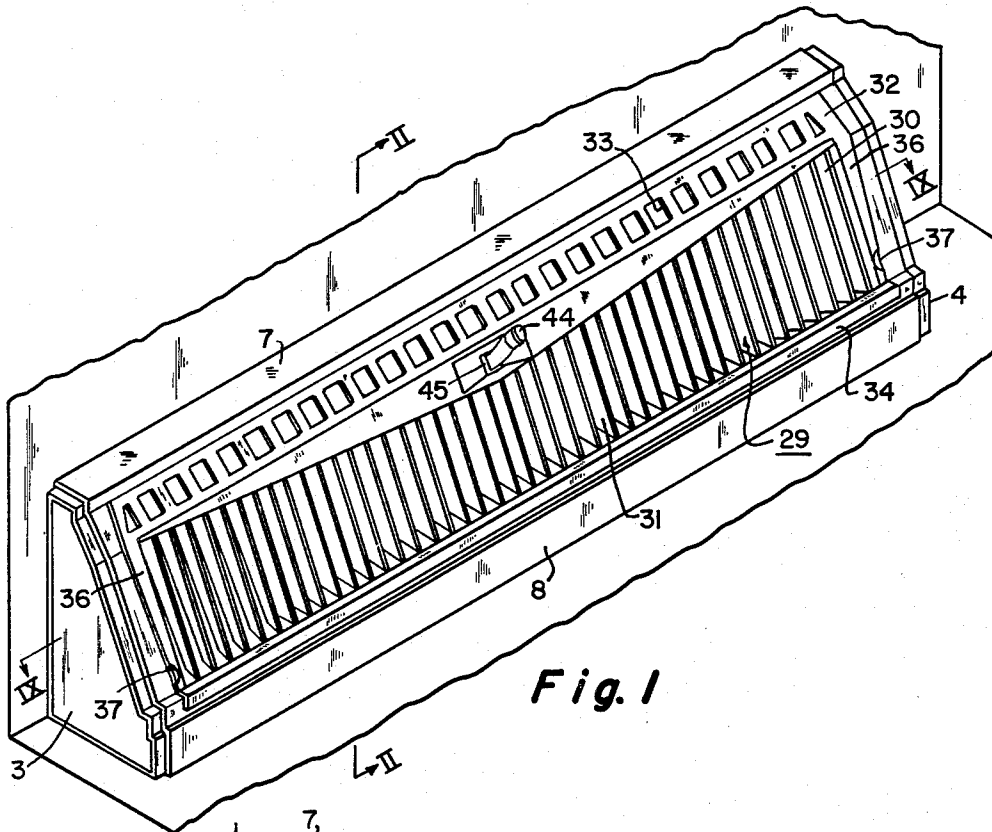
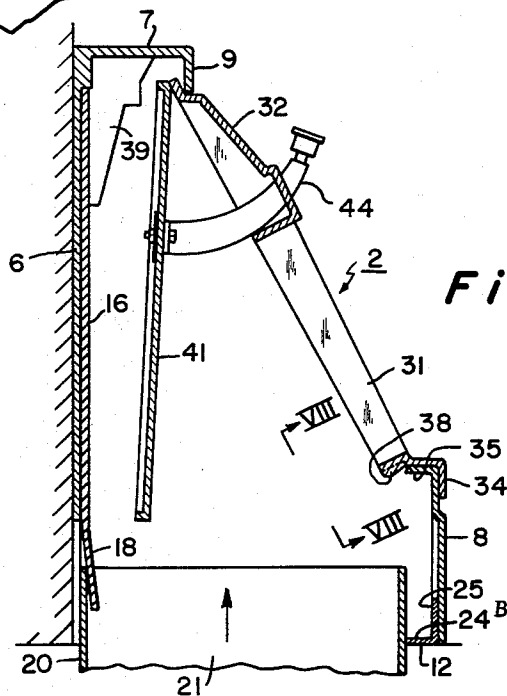
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3,190,209

REGISTER FOR DELIVERY OF AIR

Filed March 12, 1963

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

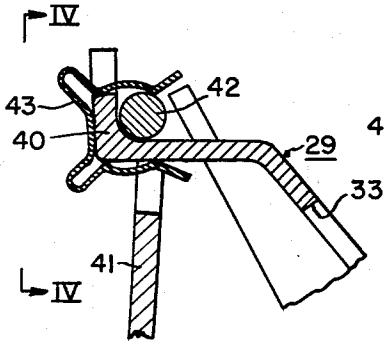


Fig. 3

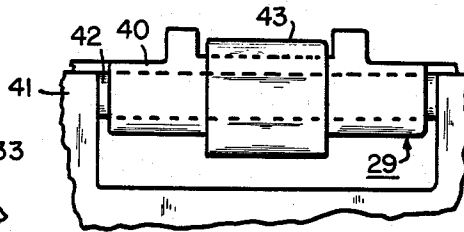


Fig. 4

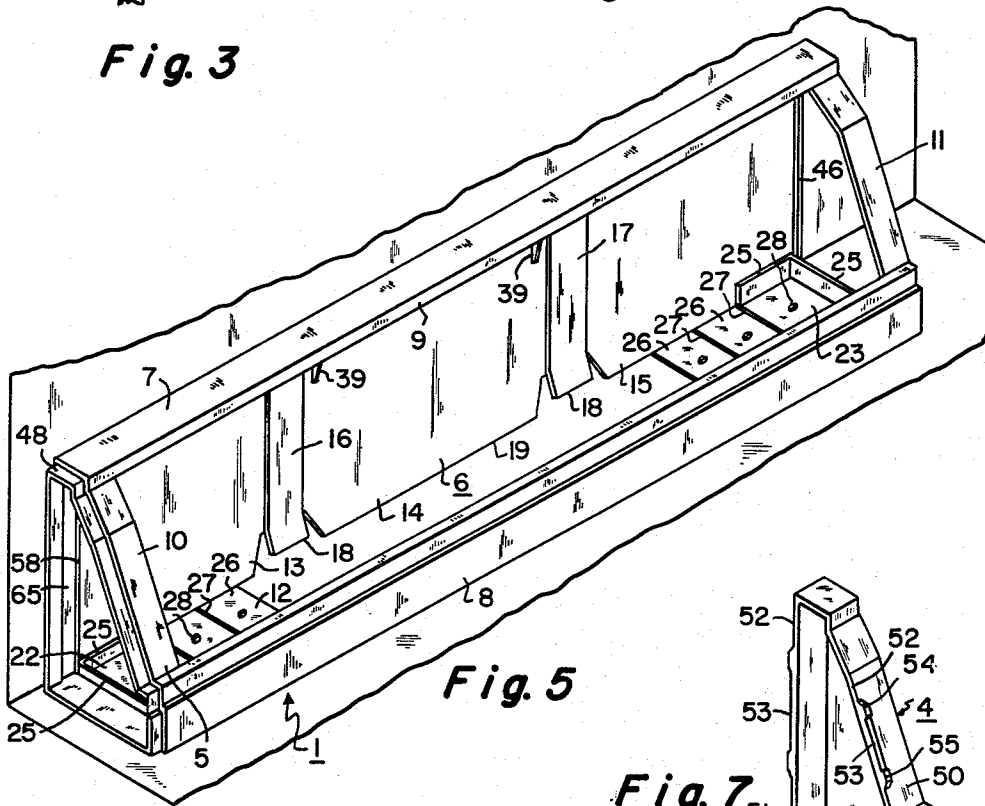


Fig. 5

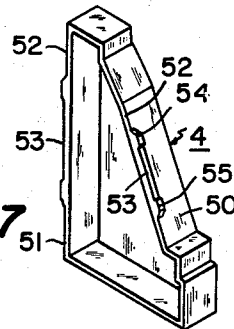


Fig. 7

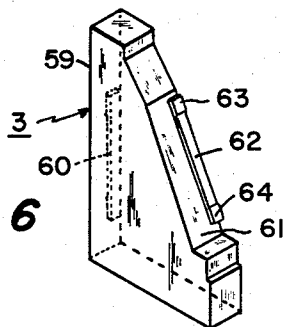


Fig. 6

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3 Sheets-Sheet 3

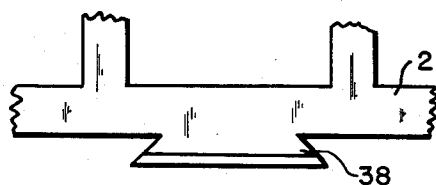


Fig. 8

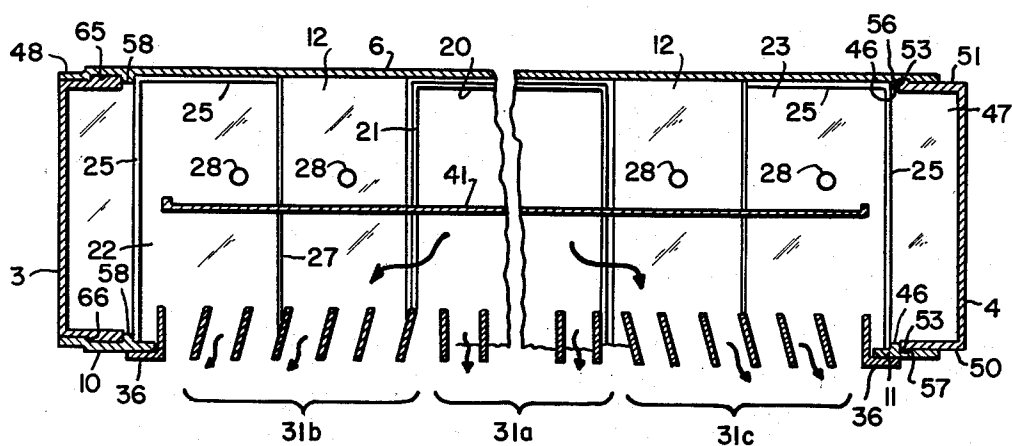


Fig. 9

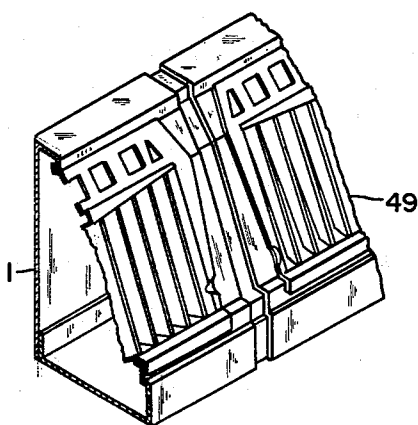


Fig. 10

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3,190,209

REGISTER FOR DELIVERY OF AIR

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2 Claims. (Cl. 98—106)

This invention relates to a register which delivers warm, cooled or fresh air into a room, hall, auditorium, or the like, and particularly to a register which is adapted for placement at the base or baseboard of a room and which is made from a good impact strength plastic material.

Conventionally, registers comprise a housing formed by side or end and rear walls and a grille which comprises a substantial part if not all of the front side of the housing. Generally, the grille is affixed to the housing which has an opening in its bottom and/or rear wall to effect a connection with an opening of a duct which conveys air thereto. This air delivered into the interior of the housing then exits into the room through openings in the grille.

Heretofore, the registers in use have had certain shortcomings which include difficulty in cleaning because of inability to easily separate the grille from its housing and to remove dirt from the housing once the grille has been taken out.

A second shortcoming has been no provision for easily adding one register to another for accommodation of at least two spaced apart ducts or for a particular installation and/or space problem. My invention provides a register which is easy to clean, has ability to deliver air in more than one direction, is easily adaptable to different sizes of air ducts and has provision for simple and easy combination with other similar registers to accommodate installation and space problems. Specifically, my register comprises a housing adapted for connection to an opening of an air duct and detachably mounting a grille in a position where it forms a front side of the register. The grille provides an attachment for a damper member such that interiorly of the housing the damper member is movable to regulate amount of air exiting from the register. Connected to the damper is a means such as a lever for moving it to a given position for control of air flow from the register.

The grille includes substantially vertically disposed vanes some of which are located in vertical planes which intersect perpendicularly a longitudinal axis of the housing. Other of the vanes are located in substantially vertical planes which intersect the longitudinal axis at acute angles. Those vanes disposed in the vertical planes which intersect perpendicularly the longitudinal axis are at a central part of the grille and a first portion of those vanes located in the planes which intersect the axis at acute angles are at one end part of the grille and extend angularly from the one end towards a central part of the housing. A second portion of those vanes located in the vertical planes which intersect the axis at acute angles are at the other end part of the grille and extend angularly from the other end towards the central part of the housing.

The grille also includes openings which are disposed in a plane positioned substantially parallel to a longitudinal axis of the housing and extending angularly towards the top of the register. The housing includes walls which define at one end a first opening and at the other end a second opening and which form at one end a receptacle shaped to engageably receive a projection formed by the walls at the other end. The projection and receptacle are so shaped that a detachable junction can be effected with an end of a second housing to provide a register having at least two sections disposed in tandem. When the regis-

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ter is not connected to a second one, a first end cover shaped to fit into and engage at least a portion of the walls which define the receptacle closes one end of the housing. This first end cover and/or the receptacle have means for providing a detachable connection with one another. For the other end of the housing, there is a second end cover formed to detachably engage the projection.

The housing has a bottom and a rear wall at least one of which includes severable sections to accommodate a connection of the register with a given size of air duct.

In the accompanying drawings, I have shown a preferred embodiment of my invention in which:

FIGURE 1 is a perspective view of my register;

FIGURE 2 is an enlarged section view along the line II—II of FIGURE 1;

FIGURE 3 is a section view at a connection of a grille of the register and a damper plate;

FIGURE 4 is a view along the line IV—IV of FIGURE 3;

FIGURE 5 is a perspective view similar to FIGURE 1 with the grille and end covers removed;

FIGURE 6 is a perspective view of a left-hand end cover of the register of FIGURE 1;

FIGURE 7 is a perspective view of a right-hand end cover of the register of FIGURE 1;

FIGURE 8 is a section view along the line VIII—VIII of FIGURE 2 showing a snap fit structure for the grille and housing of the register of FIGURE 1;

FIGURE 9 is a section view along the line IX—IX of FIGURE 1; and

FIGURE 10 is a partial perspective view showing the register of FIGURE 1 joined to a second register in an end-to-end relationship.

My register can be made from various materials such as sheet metal or plastics and particularly those plastics which are suitable for use in the injection molding processes. Some of the properties desired in the plastics are rigidity, stiffness at temperatures at least 140° F., strength, good impact resistance, creep resistance, chemical resistance, abuse resistance, and ability to be cemented, glued, lacquered, and painted. Among the plastics which are found to be satisfactory are polypropylene, high density polyethylene, nylon, polytetrafluoroethylene, styrene, styrene-acrylonitrile, styrene-acrylonitrile-butadiene and polycarbonates.

Referring to FIGURES 1-7 inclusive, my register comprises a housing 1 (FIGURE 5) which detachably mounts a grille and pivotable damper combination 2 (FIGURE 2) and left-end and right-end covers 3 and 4, respectively (FIGURES 1, 6 and 7). Thus, for easy cleaning, the grille and damper combination, as well as both end covers, are quickly removable from the housing so that they, as well as the housing, can be readily washed.

When made from plastics by an injection molding process, the housing (FIGURE 5) comprises a frame 5 having integral therewith a rear wall 6, a top panel 7, a front foot section 8 and a down-turned front side strip 9 connected to the top portion of the ends of the frame by two bands 10 and 11 which incline upwardly from the front side towards the rear wall. Glued, cemented or snap interlocked to the frame is a bottom plate 12.

As shown in FIGURES 2 and 5, the rear wall has first, second and third panels 13, 14 and 15 and two vertical strips 16 and 17, one of which separates the first and second panels and the other separates the second and third panels. The bottom portion 18 of each strip is severed from its adjacent panel and terminates short of the bottom edge 19 of the panels. Each of the panels is cut away along its lower portion adjacent the bottom portion 18 of each strip so that the bottom portion 18 functions as tabs and fits over a side 20 of an end of an air duct 21 (FIGURE 2) extending into the housing. As shown, this

air duct opens interiorly into the housing for delivery of warmed, cooled or fresh air to the register.

The bottom plate 12 (FIGURES 2, 5 and 9) comprises two horizontal end sections 22 and 23 connected by a narrow horizontal strip 24 running along the front side of the bottom plate 12. Integral with the end sections 22 and 23 and the strip 24 is a low vertical band 25 which runs peripherally the length of the strip, the length of the front side of both sections, the width of the two end panels, and then along their rear sides to form a peripheral ledge. When the bottom plate is made by injection molding, the end panels, strip and band are all integral so that the bottom panel can be readily cemented, glued or otherwise affixed to the frame.

Intermediate the two end sections 22 and 23 is a plurality of severable horizontal tabs 26 separated from their end section, from each other, and from the strip by V-shaped grooves 27 which permit easy separation of selected ones from the bottom plate. These tabs impart quick and easy adaptability of the bottom plate to different size air ducts and, as shown in FIGURE 5, some tabs have been removed to accommodate the duct 21. Each end panel and each tab have a bore 28 therethrough for accommodating a screw or bolt which attaches the housing to a floor in a room.

Of course, the rear wall may be similarly provided with severable tabs to render it adaptable to different size ducts which are located in a side wall as distinguished from the floor of a room.

The grille 29 of the combination 2 has a lower section 30 which includes a plurality of vertically spaced apart vanes 31 and an upper section 32 which includes a plurality of spaced apart windows 33 integral therewith. This lower-section has a right angle foot 34 integral therewith and extending lengthwise of the grille. The foot 34 is shaped to engage and seat against the top of the front foot section 8 whose top comprises a right angle ledge 35. At each end of the grille is a flange 36 which fits over and engages an edge portion of the bands 10 and 11. On each flange is a finger grip 37 for easy separation of the grille from the housing. Spaced along the inside of the right angle foot are small projecting lips 38 (FIGURE 8) shaped to provide a snap fit of the grille upon the housing and disposed to extend diagonally inwardly from the inner end of the ledge 35 of the front foot section 8.

Affixed to the rear wall 12 interiorly of the housing are two spaced apart brackets 39 which impart rigidity thereto.

The windows 33 in the upper section 32 of the grille 29 lie in a plane which is parallel to a longitudinal axis of the housing and which incline from the upper part of the lower section 30 towards the top panel 7 of the housing. Such a disposition of the windows directs air exiting therethrough upwardly relative to that air which flows out between the vanes 31.

The vanes comprise three groups, the first 31a (FIGURE 9) of which is in the central part of the grille and which lies in vertical planes positioned to intersect perpendicularly a longitudinal axis of the housing. Accordingly, this first group directs air substantially directly forward and upwardly a small amount since the grille fits against the upwardly inclined bands 10 and 11.

The vanes of the second group 31b are at the left end part of the grille viewing FIGURES 1 and 9 and are in vertical planes which intersect the longitudinal axis at acute angles and which extend angularly from the left end part towards a central part of the housing.

The vanes of group 31c are at the right end of the housing and lie in vertical planes which intersect the longitudinal axis at acute angles and which extend angularly from the right end of the housing towards a central portion. Thus, the combination of the three groups of vanes and the windows disperses air from the register in four different directions and thereby increases the rate of warming, cooling or ventilating a room.

At the top of the grille and integral therewith are four spaced apart saddles 40, two of which have been referred to, which pivotally mount a damper 41 by seating four trunnion pins 42 integral with the damper along its top side. A spring clamp 43 engages each trunnion pin 42 and its saddle 40 to provide a friction pivotal mounting of the damper upon the grille. This friction mounting permits the damper to be moved to a given position interiorly of the housing and there maintained for regulation of amount of air exiting out through the vanes and windows. The force of the spring clamp upon the trunnion and its saddle assures retention of the damper in the given position. These spring clamps are easily attached to and detached from the grille and thus provide a detachable mounting for the combination of the damper and the grille.

Connected to the damper at one side is a push-pull lever 44 (FIGURES 1 and 2) which projects out through an opening 45 in the grille to provide easy positioning of the damper within the housing.

At the right end of the housing and indented interiorly therefrom is a first stop rib 46 which is perpendicular to a longitudinal axis of the housing and extends peripherally along the rear wall 6, across the top plate 7, and along the band 11 and inside wall of the front foot section 8. This first stop rib, in combination with the inside walls of the housing, excluding the bottom plate 12, forms a receptacle 47 shaped to receive and engage a projection, such as projection 48, at the left end of the housing to effect an end-to-end connection of one register to a second one 49, as shown in FIGURE 10.

FIGURE 5 shows the projection 48 at the left end of the register as formed integrally with the housing and as being an extension of the left end of the housing and of the bottom plate 12. The projection has the peripheral shape of a cross section of the housing and, except for the bottom plate portion, is indented an amount equal to the thickness of the peripheral wall of the housing. Accordingly, it fits into and peripherally engages the first stop rib 46 and interior walls of a receptacle, such as receptacle 47, at an end of the second register 49 to form two arranged in tandem (FIGURE 10).

When the right end of the register is not joined to a second one, the right end cover 4 is detachably mounted in the receptacle 47 (FIGURES 5, 7 and 9). This right end cover is a half shell which has a peripheral contour similar to the periphery of the receptacle 47 and sufficiently smaller so that the cover fits into the receptacle and extends from the right end of the housing an amount substantially equal to the extension of the projection 48 from the left end of the housing. On its front and rear sides 50 and 51, respectively, and along a portion of the inside edges 52 of each is a low raised land 53 which has two spaced apart extensions 54 and 55. The lands and extensions engage two corresponding slots 56 and 57 on the inside of the rear wall and the inside of the band, respectively, to provide a snap fit of the cover within the housing.

To close the left end of the housing, I use the left end cover 3 and a half shell which fits inside the projection 48 and extends into engagement with a second stop rib 58 of the frame (FIGURES 5, 6 and 9). The contour of this cover 3 is that of the periphery of the projection and, accordingly, engages same substantially around its interior periphery. On the rear side 59 of the cover is a low raised land 60 and on the front side 61 another low raised land 62, each running along a portion of its respective side. Each land has two spaced apart extensions 63 and 64 (shown only re land 62) and the lands and extensions, in combination with grooves 65 of the housing, provide a snap fit for the cover. These grooves of the housing are formed by the inside edge 66 of the projection 48 and the stop rib 58. The end covers 3 and 4 form end walls of the housing and in some register sections one or both such covers are affixed to the housing

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and the bands 10 and/or 11 then form an inwardly extending flange of these end walls. Also, the stop ribs 46 and 58 can be considered end walls with an opening therethrough and with the bands 10 and 11 forming the inwardly extending flanges thereof.

My invention has a number of features which render it advantageous and attractive. In the first place, the detachable grille, damper and end covers permit easy and fast cleaning.

In the second place, a number of register sections can be readily connected end-to-end without loss of attractiveness and without modification to any section.

In the third place, the register has ability to deliver air in four different directions.

In the fourth place, when made from plastics, there is no rust problem.

In the fifth place, the register is easily adaptable to different sizes of air ducts.

In the sixth place, my invention embodies a combination of two or more of the above-identified features into one register.

While I have shown and described a preferred embodiment of my invention, it is understood that it may be otherwise embodied within the scope of the following claims.

I claim:

1. An air register section comprising

- (a) a housing formed of top, back, front, inclined front and end walls,
- (b) said inclined front wall being a removable grille mounted in an opening between said top, front and end walls,
- (c) said front and end walls having inwardly extending flanges along the front side of said housing,
- (d) said top wall having a depending flange along the front side of said housing, said flanges of said front, end and side walls defining said opening,
- (e) said grille having outwardly extending flanges along its outer edges, the side and lower flanges of said grille resting on said side and lower flanges of said opening and the upper flange of the said grille extending under said depending top flange,

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(f) the flanges of said grille having projecting lips which provide a snap fit of the grille to said flanges of said opening,

(g) a damper,

(h) means pivotally and detachably mounting said damper upon said grille interiorly of said housing and permitting movement of said damper to regulate amount of air exiting from said register,

(i) said means including detachable spring members which engage a portion of pivot members of said damper and a portion of said grille to form said detachable mounting of said damper.

2. The register section of claim 1 wherein one of said end walls has an opening therethrough, said top, back and front walls each having an outwardly extending inset flange to form a projection of complementary peripheral configuration to said end of said housing so that the other end of a like housing may be received thereby to form a register comprising two sections arranged in tandem, said other end of said second mentioned housing including an opening therethrough, the top, back and front walls of said other end of said last mentioned housing having outwardly extending flanges forming a projection of complementary peripheral configuration and disposed to receive therein said inset flanges of said first mentioned housing.

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