June 6, 1944. A. P. LIVAR 2,350,514

AIR DEFLECTOR FOR AIR DUCTS

Filed Oct. 30, 1942

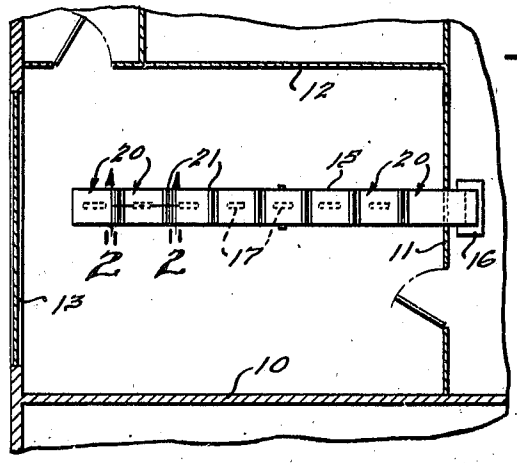


Fig. 1.

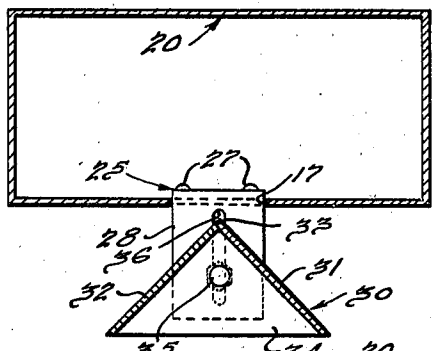


Fig. 3.

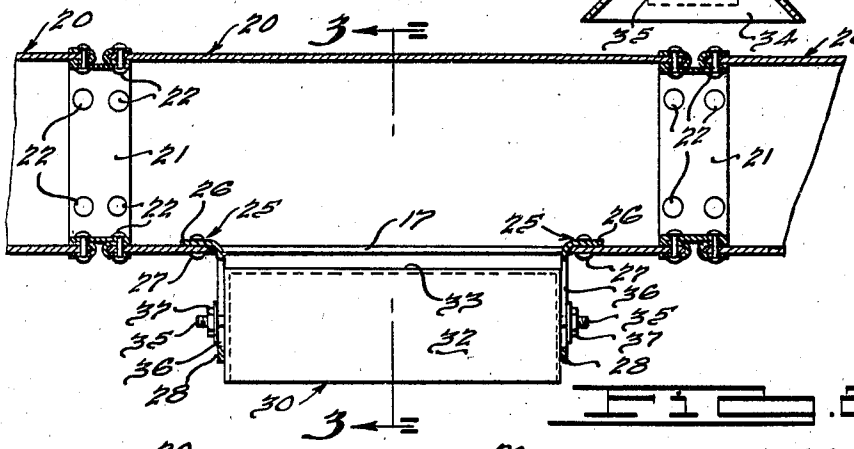


Fig. 2.

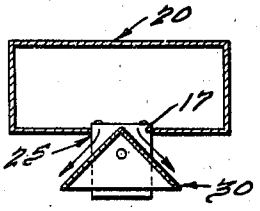


Fig. 4.

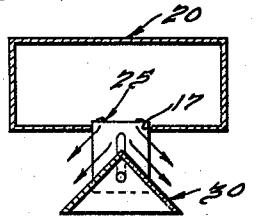


Fig. 5.

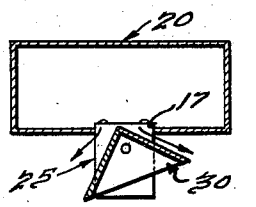


Fig. 6.

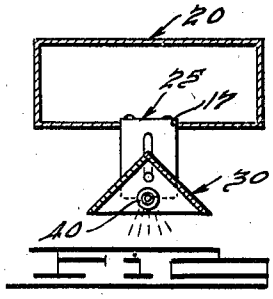


Fig. 7.

INVENTOR
ALLEN P. LIVAR
BY
Harness, Lind, Cate & Harris
ATTORNEY

Patented June 6, 1944 2,350,514

UNITED STATES PATENT OFFICE

2,350,514

AIR DEFLECTOR FOR AIR DUCTS

Allen P. Livar, Dayton, Ohio, assignor to Chrysler Corporation, Detroit, Mich., a corporation of Delaware

Application October 30, 1942, Serial No. 463,871

3 Claims. (Cl. 98—40)

My present invention relates to air distribution systems and specifically comprises means for distributing air from an outlet opening in a trunk duct, or the like. The invention is of particular utility in connection with overhead ducts, but it is to be appreciated that the term "overhead" as used in this specification is used for providing a reference plane for the purpose of defining the relative position of parts of the invention, the invention having utility in connection with a duct which may extend along the side wall or intermediate portions of a room with openings for projecting air horizontally or vertically upward from the duct.

A particular object of the invention is to provide an air distributor for a duct formed of so-called substitute materials, such as plaster board, compressed fiber board, asbestos board, plywood, and the like, although it may be readily associated with the common metal duct.

A further object of the invention is to provide an air distributor which is formed of few, simply manufactured parts, and which may be purchased and installed at little expense of time, labor, and money.

A further object of the present invention is to provide an air deflector which may be adjustably positioned to control the volume of air issuing from an opening in a duct, and which may be adjustably positioned to project more air toward one side of the duct than toward the other.

These and other objects and advantages will be readily apparent to those skilled in the art after a study of the following specification taken in connection with the accompanying drawing wherein like numerals refer to like parts throughout.

In the drawing,

Fig. 1 is a top plan view of a room having a duct, with the present invention added thereto, suspended from the ceiling of the room;

Fig. 2 is a longitudinal central section through a portion of the duct, taken substantially along line 2—2 of Fig. 1;

Fig. 3 is a vertical section, taken substantially along line 3—3 of Fig. 2;

Fig. 4 is a diagrammatic view on a reduced scale, similar to Fig. 3, showing one position of the distributor;

Fig. 5 is a similar view showing the distributor in another position;

Fig. 6 is a similar view showing the distributor in a third position; and

Fig. 7 is a similar view of a modification of the invention showing further utility therefor.

In Fig. 1 a room having side walls 10, 11, 12 and 13 is provided with an overhead duct 15 extending from an air conditioning unit 16 or other source of air to be distributed throughout the room. Since the duct 15 is in an overhead position the present invention is applied by providing a plurality of central longitudinal slots 17 in the lower wall of the duct, but it is to be appreciated that if the duct 15 were positioned along a side wall of the room the slots 17 might be positioned in the vertical wall of the duct facing the room; hence the relative positions hereinafter described are so given as to define the invention and not to limit its position of use.

Since the invention is of particular utility in connection with ducts made of board-like materials, I have illustrated the duct as comprising a plurality of rectangular sections 20 formed by holding flat boards in connecting collars 21 by means of rivets 22 or the like, the collars being so fashioned as to provide means for fastening the sections 20 in end-to-end relationship. Selected ones of the sections 20 are provided with the longitudinal central slots 17 in the lower wall of the sections, through which air may be projected into the room.

In order to control the amount, velocity and direction of projection of the air emerging from each slot 17 I provide a pair of hanger members 25, one at each end of the slot 17, the members comprising horizontal legs 26 adapted to project into the duct and rest upon the lower wall of the duct adjacent the ends of the slot, being held in such position by fastening means such as rivets 27. The hanger members also comprise vertical legs 28 extending downwardly from the ends of the slot. An air deflector 30 is adjustably positioned between the hanger legs 28, the deflector preferably comprising a sheet of material bent to provide laterally sloping sides 31 and 32 extending from an upper ridge 33. If board-like material is used the sides 31 and 32 may comprise separate boards meeting to form a ridge 33. The ends of the sides 31 and 32 are joined by end plates 34 from which project supporting pivot pins 35 located in a plane substantially bisecting the angle between the sloping sides. The pins 35 project through openings 36 in the vertical legs 28 and are provided with threads whereby nuts 37 may clamp the end plates 34 against the legs 28. The openings 36 are preferably in the shape of vertical slots extending throughout most of the length of the legs 28 whereby the deflector may be adjustably positioned vertically of the legs to decrease or increase the air gaps between the

edges of the slot 17 and the sides of the deflector, such increase or decrease at the same time reversely affecting the velocity of the air emerging from the air gaps so provided.

As seen in Figs. 4 and 5 the deflector may be adjusted vertically to provide equally sized slots at each side so that an equal volume of air may be projected to each side of the duct, the vertical adjustment providing variance in amount and velocity of air projected from the various slots so that the distribution system may be balanced to cause the air to be projected uniformly throughout the room.

As seen in Fig. 6 the distributor may be canted so that the plane bisecting the sloping sides is at an angle with respect to the vertical plane through the slot 17, thus providing means whereby air may be spilled substantially vertically downward at controlled velocity and in controlled quantities, or air may be projected substantially horizontally to reach a far corner. The adjustment may be such as to cause all of the air to drop substantially vertically downward by closing one side of the slot entirely. It may be seen that by providing a plurality of deflectors throughout the length of the duct and by adjusting the position of each of the deflectors, the entire area may be uniformly supplied with air.

If desired, the deflector may serve a double purpose by fashioning the member to form the reflector for a source of light, such as the fluorescent tube 40 extending longitudinally of the deflector between the two sides thereof as seen in Fig. 7.

Having illustrated and described the preferred embodiment of my present invention, it should be apparent to those skilled in the art that the same permits of various modifications in detail and arrangement. All such modifications as come within the scope of the following claims are to be considered a part of my invention.

I claim:

1. An air distribution system comprising an overhead duct having a longitudinally extending slot through its lower wall, a vertical plate extending from the lower wall of said duct at each end of said slot, an opening through each of said plates substantially in a vertical plane through the longitudinal centerline of said slot, an air deflector comprising a pair of sloping sides of substantially the same length as said slot and extending downwardly from a central ridge, means to support said air deflector beneath said slot comprising a pair of longitudinally extending pins adapted to pass through said openings and projecting from the ends of said air deflector in a plane substantially bisecting the angle formed by said sloping sides, the arrangement being such that the plane bisecting said sloping sides may be canted with respect to the vertical whereby to cause more air to be deflected toward one side of the duct than toward the other, and means to hold said deflector in canted positions.

2. An air distribution system comprising an overhead duct having a longitudinally extending slot through its lower wall, a vertical plate extending from the lower wall of said duct at each end of said slot, an opening through each of said plates substantially in a vertical plane through the longitudinal centerline of said slot, an air deflector comprising a pair of sloping sides of substantially the same length as said slot and extending downwardly from a central ridge, means to support said air deflector beneath said slot comprising a pair of longitudinally extending pins adapted to pass through said openings and projecting from the ends of said air deflector in a plane substantially bisecting the angle formed by said sloping sides, said openings being of considerable extent vertically of said plates whereby said sloping sides may be adjustably spaced from the longitudinal edges of said slot, the arrangement being such that the plane bisecting said sloping sides may be canted with respect to the vertical whereby to cause more air to be deflected toward one side of the duct than toward the other, and means to hold said deflector in canted and vertically adjusted positions.

3. In an air distribution system, an overhead duct formed with a longitudinally extending slot in the lower wall thereof, a hanger depending from the duct at each end of the slot, and an air deflector adjustably supported between said hangers, said deflector comprising a member having an angular cross section and downwardly and outwardly sloping sides converging in a ridge adapted to be positioned substantially parallel to the longitudinal axis of the slot, said sides being of such width as measured from the ridge to the lower edges thereof as to underlie the longitudinal edges of said slot, connecting means between each end of the deflector and the hanger adjacent thereto comprising an elongated opening formed in one of said adjacent parts and a cooperating pin on the other, whereby the deflector may be adjusted both vertically and angularly with respect to the slot, the angle between said sides being such with respect to their width and the length of said elongated openings that the deflector may be selectively positioned to divide air flowing through the slot uniformly and angularly on each side of the duct, substantially vertically downwardly on one side and substantially horizontal on the opposite side, and to close the opening between the duct and deflector on one side of the slot.

ALLEN P. LIVAR.