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AIR CONDITIONING AND SOUND DEADENING CEILING INSTALLATION

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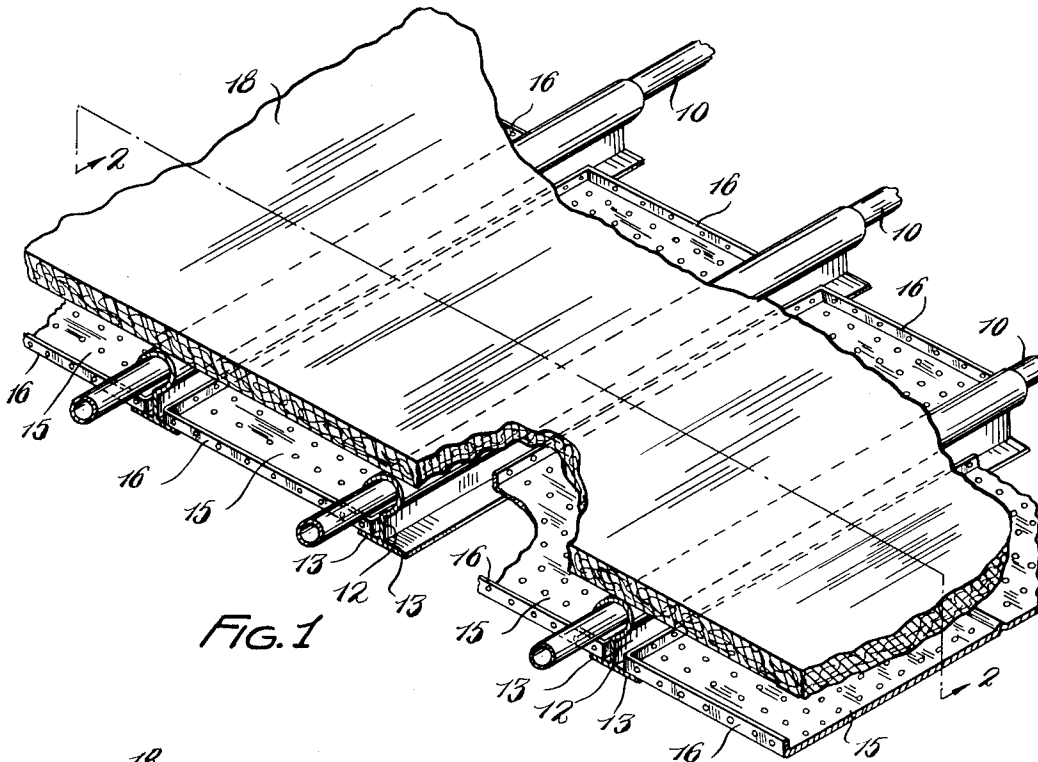


FIG. 1

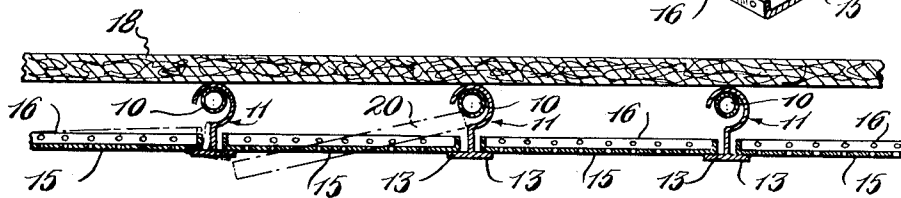


FIG. 2

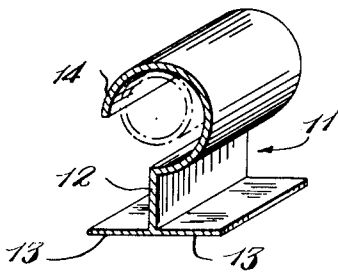


FIG. 3

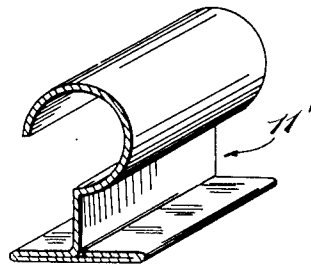


FIG. 4

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AIR CONDITIONING AND SOUND DEADENING CEILING INSTALLATION

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1 Claim. (Cl. 257—124)

This invention relates to improvements in air conditioning and sound deadening ceiling installations, especially mountings for air conditioning ceiling units. In equipment of this nature it is known to employ at the ceiling a series of small diameter pipes, spaced apart uniform distances, through which pipes a heating or cooling fluid may be circulated. Perforated sheet metal pans, preferably aluminum on account of its light weight and good heat conductivity are hung from these pipes in such manner as to conceal the pipes and form a substantially continuous ceiling surface. Good heat transmitting contact between the pipes and pans is provided by the suspending means. In this manner the pans provide large heat exchange surfaces that are effective for either heating or cooling the air in a room. Over the assembly of pipes and pans there is placed sound deadening and heat insulating material in slab or blanket form.

One of the objects of the present invention is the provision of improved means for supporting pans of the character stated which shall be effective for transmitting heat in either direction between the pipes and the pans.

Another object is the provision of supporting means which shall permit the use of pans of simple construction, that is pans devoid of special structural features that are difficult and expensive to build.

A further object is the provision of pan supporting hangers or rails that may be hung upon the spaced pipes without fastenings of any kind and which embody longitudinally extending flanges upon which the pans rest.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawing, in which

Fig. 1 is a fragmentary perspective view of an assembly of ceiling units, with portions broken away to more clearly illustrate the invention.

Fig. 2 is a cross-sectional view taken substantially on the line 2—2 of Fig. 1, and

Figs. 3 and 4 are perspective views, partly in cross-section, of supporting hangers or rails which may be employed in connection with the invention.

In Fig. 1 which represents a small portion of sound deadening and air conditioning equipment for the ceiling of a room, a series of evenly spaced parallel horizontal pipes are shown at 10. These pipes are made of aluminum preferably because of its high heat conductivity, its resistance to corrosion and its light weight. They are of small bore and preferably are about one-half inch in outer diameter. They are supported in some suitable manner near the ceiling of a room and are connected with a fluid circulating system which may be employed for heating purposes during the winter and for cooling purposes in the summer. They are spaced apart evenly at a distance preferably of the order of twelve inches.

Upon each pipe 10 there is mounted an elongated hanger or rail designated generally by the reference character 11. These hangers or rails come in eight foot, ten

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foot and twelve foot lengths and may be abutted end to end in cases where they are not long enough to span the distance between opposite walls of a room. They are formed of metal having good heat conducting qualities, preferably aluminum. Each rail has a vertical web 12, oppositely extending base flanges 13 and a hook portion 14 projecting upwardly from the web 12. Preferably the hook portion is arcuate in cross section as herein illustrated, and the opening in the hook is wide enough to clear a pipe 10 in order that the rail may be hung upon the pipe by a diagonally downward motion. The hook portion may be other than arcuate in cross section, but it should comprise a curved portion directly above the web that can engage the top of the pipe and enable the rail to assume a vertical position due to gravity, the center of gravity of the rail being substantially in the plane of web 12, or to adjust itself to a very small degree if the load on the opposite flanges 13 is not perfectly balanced.

In Fig. 3 I have shown a rail formed as an extrusion product, while that illustrated in Fig. 4 at 11' is rolled from sheet metal. Either one is quite suitable so far as its functioning in the present invention is concerned.

Sheet metal pans 15, preferably having a multitude of perforations as shown, rest upon facing flanges of two adjacent rails 11. These pans may be of a width somewhat less than the spacing of pipes 10 but greater than the spacing of the adjacent edges of the bottom flanges on adjacent rails 11. Their length may be whatever is convenient, that shown being approximately twice the width. They have upstanding border flanges 16 all around their perimeter. At their lateral edges the pans rest on the facing flanges 13 of adjacent rails. They are sufficiently narrower than the spacing of pipes 10 to enable them to be set in place by the procedure indicated in broken lines 20 in Fig. 2.

The flanges 13 are wide enough to provide considerable bearing surface for engagement with the pans, and this is important in respect to the air conditioning function of the apparatus, as it is necessary that good heat conductivity be maintained in order that heat may be transferred from pipes 10 to pans 15 in the winter months and that similar conductivity be maintained in the summer months for transmitting heat absorbed by the metal pans from the atmosphere and carried through flanges 13, web 12, and hook portion 14 of the rails into the pipes 10 and the cooling fluid then flowing through them.

The pans at each side of the room beyond the last pipe 10 may be supported at one side on a flange 13 and at the other side on a strip of molding fastened to the side wall, molding being used also at the ends of the room to conceal the joints between the pans and the walls. The flanges 13 in addition to their pan supporting functions constitute decorative strips which close the lateral joints between pans and contribute to the general appearance of the ceiling assembly. If any pan should be damaged it may be removed and replaced readily without disturbing other pans.

As shown in Fig. 2, a blanket or slab 18 which is formed of material that is sound deadening and also heat insulating is placed over the pipes 10 and hangers or rails 11 after the latter are hung on the pipes. The installation thus possesses good acoustical as well as air conditioning characteristics.

Having thus described my invention, I claim:

A series of parallel horizontal metal pipes at the ceiling of a room through which heating or cooling fluid may be circulated, a metallic rail depending from each of said pipes, each of said rails having a vertical web and base flanges extending laterally on each side of the web, each rail comprising an integral open arcuate hook portion above its web hung over and contacting the correspond-

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ing pipe, and a plurality of metal pans supported upon the facing side flanges of adjacent rails, each of said hook portions conforming in cross section to an arc of a circle of greater diameter than the diameter of the pipe on which it hangs, and the center of gravity of the supported rail lying substantially in said web, whereby fluid at a temperature other than room temperature when circulated through said pipes transfers heat to or from said pans because of the contact between the pipes and the rails and between the base flanges of the rails and the pans, and whereby a rail may be tilted upon its pipe to permit a pan to be removed and a new one to be installed.

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