

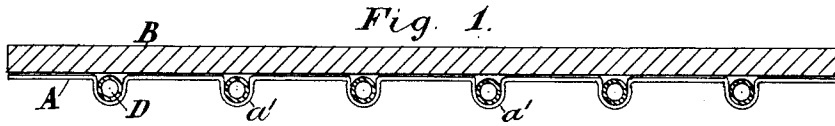
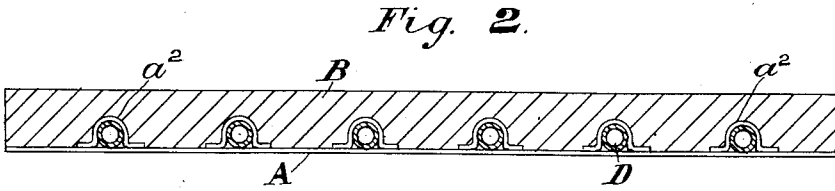
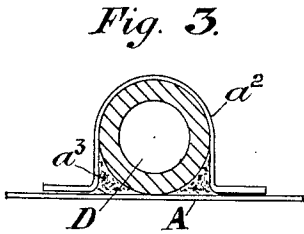
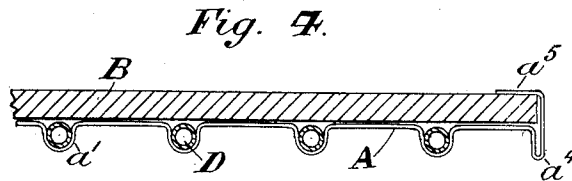
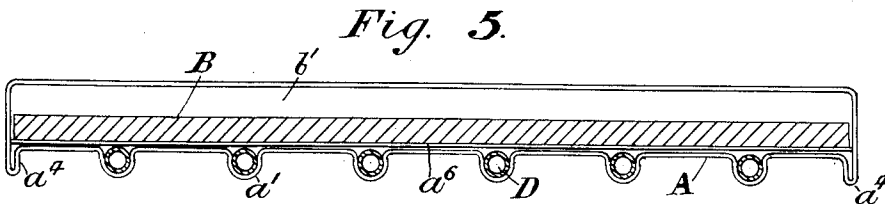
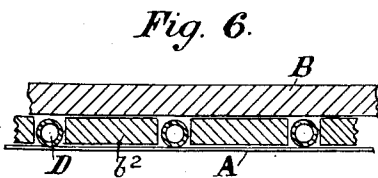
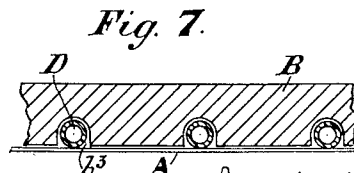
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HEATING AND COOLING OF BUILDINGS

Filed Jan. 19, 1928



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UNITED STATES PATENT OFFICE

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HEATING AND COOLING OF BUILDINGS

Application filed January 19, 1928, Serial No. 247,995, and in Great Britain January 29, 1927.

This invention refers to the heating or cooling of the walls, floors or ceilings of a building by the circulation or passage of a heating or cooling fluid or other heating medium through a system of pipes covered by a material which diffuses the heat, such heat being transmitted to the material in which the pipes are carried or supported and from the surface of which material said heat radiates, and has special reference to that system known as panel heating. The object of the invention is to devise new means for carrying or supporting the pipes through which the heating medium circulates or passes, and also to obtain a better diffusion of the heat over the material in which the said pipes are carried or supported from the surface of which material said heat radiates.

According to this invention the pipes through which the heating medium circulates or passes are carried or supported by a frame or casing made of sheet metal, asbestos, or other suitable material. Grooves or channels are formed in the surface of the frame or casing for the pipes to rest in, the number of such grooves or channels being determined according to the number of pipes used in the system, which pipes are then covered with slabs of cork or other insulating material.

Outwardly projecting flanges are preferably formed on the edges of the frame or casing, running parallel with the grooves or channels, to promote radiation and hinder convection and thereby ensure the fullest extent of radiation of heat from the surface of said frame or casing, and if desired such flanges may be formed so as to project inwardly to cover and embrace the pipes or tubes and insulating material. Or the frame or casing may be made to entirely enclose the pipes and insulating material and an air space may be formed between the insulating material and the frame or casing.

In some cases instead of forming grooves or channels in the frame or casing to receive the pipes or tubes, we may form the frame or casing upon or against which the pipes

rest with a flat surface, and, if desired, enclose each pipe in a groove or channel made from a separate piece of metal or other material, and the space between the pipes and the enclosing channels may be filled in with a composition which when set will bind or cement the parts together.

When high temperature fluids are used as a heating medium we may employ a spreader or spreaders, made of metal or a non-conducting material, interposed between the pipes and the slabs with which they are covered.

The invention is illustrated on the accompanying drawings.

Fig. 1 is a sectional view showing the pipes through which the heating or cooling medium circulates laid in grooves or channels made in the frame or casing by which they are carried or supported.

Fig. 2 is a similar view to Fig. 1 showing each pipe enclosed in a groove or channel made separately from the frame or casing, the frame or casing being formed with a flat surface.

Fig. 3 is an enlarged broken sectional view showing how the parts, in the method shown by Fig. 2, may be cemented together by filling in the enclosing channels with a composition.

Fig. 4 is a broken sectional view showing how outwardly and inwardly projecting flanges may be formed on the edges of the frame or casing to hinder convection and ensure the fullest extent of radiation of heat from the surface of such frame or casing.

Fig. 5 is a sectional view showing the frame or casing which supports the pipes entirely enclosing said pipes and insulating material, an air space being formed between the insulating material and the frame or casing.

Fig. 6 is a broken sectional view showing the frame or casing with a flat surface and a block or blocks of insulating material interposed between each pipe.

Fig. 7 is a broken sectional view showing the frame or casing with a flat surface, the insulating material being formed with

grooves or channels to fit over or onto the pipes.

A represents the frame or casing of any suitable area, a' the grooves or channels formed in said frame or casing, B the insulating material, and D the pipes through which the heating or cooling fluid circulates.

In the construction shown by Fig. 1 grooves or channels a' are formed in the surface of the casing A, in which grooves the pipes D rest, said pipes D being covered with slabs of cork or other insulating material B; whereas in the construction shown by Fig. 2 the frame or casing A is formed with a flat surface and the pipes D, which rest upon this flat surface, are each enclosed in a groove or channel a'' made from a separate piece of metal or other material. If desired the space between the pipes and the enclosing channel may be filled with a composition a'' which when set binds or cements the parts together, as clearly shown by Fig. 3.

At Fig. 4 we have shown the frame or casing A formed with outwardly projecting flanges a^4 on the edges. These flanges are provided to radiate heat therefrom and hinder convection of heat around the edges of the slab B so as to ensure the fullest extent of radiation of heat from the surface of the frame or casing A. Inwardly projecting flanges a^5 may also be provided for the same purpose, and these flanges a^5 may embrace the pipes D and insulating material B as clearly shown. Or the flanges may be made independently from the frame or casing A.

In some cases we may form the frame or casing A to entirely enclose the pipes D and insulating material B, and an air space b' may be formed between the insulating material B and the frame or casing A. A spreader or spreaders a^6 made of metal or non-conducting material may be interposed between the pipes D and the slabs B with which they are covered, as clearly shown by Fig. 5.

At Fig. 6 we have shown the frame or casing A with a flat surface, the pipes D being laid upon such surface and a block or blocks of insulating material b^2 interposed between each pipe D, and the insulating material B above.

In the example shown by Fig. 7 the frame or casing A is also formed with a flat surface upon which the pipes D rest. In this case we have shown the insulating material B formed with grooves or channels b^3 which fit over or onto the pipes D.

In each embodiment of the invention the pipes are disconnected from the insulating slab so as to be freely removed therefrom when or after the casing or covering is removed from the slab, and as shown in Figs.

2 and 3 the pipes may be attached to the casing or covering to be removed therewith from the slab. The insulating slab, metal sheet and pipes between them constitute a unit, being assembled as such, and being readily built into the wall, ceiling or floor of a room.

What we claim as our invention and wish to secure by Letters Patent is:—

1. A heating or cooling panel of the kind described comprising a slab of insulating material, a sheet of heat conducting material extending across same, and pipes for the flow of fluid therein confined between said sheet and slab and contacting with said sheet, said slab, sheet and pipes constituting a unit adapted to be built in the wall, floor or ceiling of a room.

2. A heating or cooling panel of the character described comprising a slab of insulating material, a sheet of conducting material extending across same, and pipes for the flow of fluid therein confined between said sheet and slab and contacting with said sheet, said slab and sheet being in contact and one of them having grooves in which the pipes are located, said slab, sheet and pipes constituting a unit adapted to be built in the wall, floor or ceiling of a room.

3. A heating or cooling panel of the character described comprising a slab of insulating material, a sheet of conducting material extending across same, and pipes for the flow of fluid therein confined between said sheet and slab and contacting with said sheet, said slab and sheet being in contact and the sheet being bent to form grooves receiving the pipes.

In testimony whereof we have signed our names to this specification.

JOSEPH LESLIE MUSGRAVE.
EDGAR HERRING.