Feb. 25, 1941. R. AMOROSI 2,233,190

INSULATING BOARD

Filed Nov. 7, 1938

Fig. 1

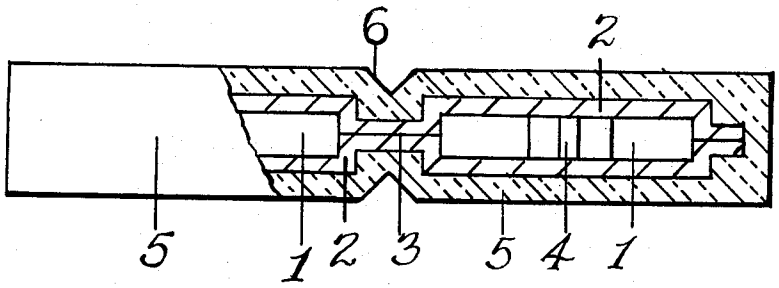
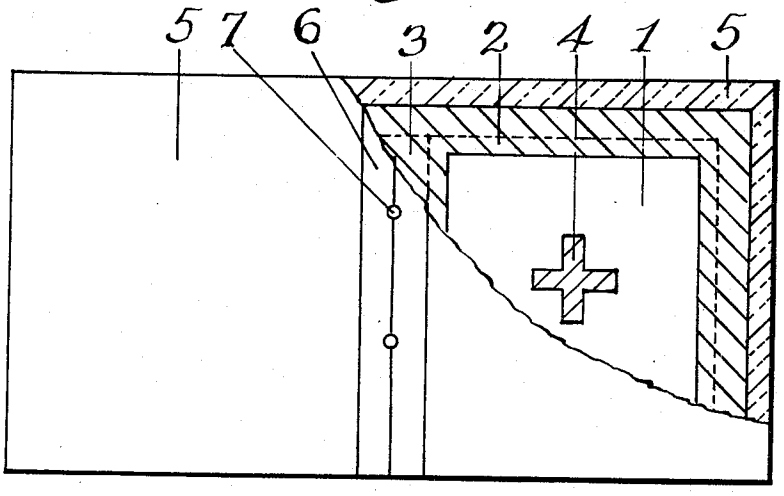


Fig. 2



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INVENTOR.

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INSULATING BOARD

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7 Claims. (Cl. 20—4)

This invention relates to vacuum cell insulation boards adapted for use in building construction roofs of automobiles, heating, air-conditioning and refrigerating structures.

The object of the present inventon is to provide an improved insulation means, of the type indicated, in board or slab form that can be easily handled and cut into sections for installation with the greatest economy of space and material.

The objects of the invention are accomplished by means of a construction as illustrated in the accompanying drawing, wherein:

Fig. 1 is an end view of the insulating board partly in section.

Fig. 2 is a plan or face view of the board partly in section.

In the form shown in the drawing my improved insulating board comprises a hollow metal inner structure formed of itself, to provide a plurality of enclosed hermetically-sealed cells or chambers 1 which constitute separate individual spaces having no connection with each other. The inner structure, which comprises walls 2, is made of any suitable, substantially-rigid material such as sheet metal and is formed by providing pan-like wall members having upstanding edges and marginal flanges projecting outwardly therefrom, together with flat-surfaced, upstanding transverse ribs; which pan members are then set face to face with the flanges and ribs abutting each other, the abutting flanges and flat-surfaced ribs being joined to one another by any suitable means such as welding, whereby air-tight seams or joints 3 are formed. Thus, the flanges seal the hollow inner structure at its margins and the abutting ribs divide the interior of the inner structure into a plurality of air-tight cells, the side walls of the inner structure between the flanges and the ribs being spaced from each other by the upstanding edges and the ribs to provide the cell cavities.

In the form shown, the inner structure of my improved insulating board is further reinforced by spacing members 4 disposed in substantially the center of each cell or space 1 and extending between the side walls 2. These spacing members 4 serve to prevent crushing or collapsing of the side walls under atmospheric pressure or mechanical force, and are held in place by any suitable means such as by welding.

After the inner structure is formed the inner cell or chamber may be exhausted in any suitable manner, several of which are known in the art, thus removing dead air and providing a vacuum through which heat cannot travel by conduction, and increasing the insulating efficiency of the board as a whole.

As shown, the inner structure of my improved board is wholly covered on its outside by a suitable fibrous insulating covering 5 which is glued or otherwise secured to the outside of the side walls 2. This fibrous material covering serves to provide a more readily handled board and to protect the inner structure from damage and further serves to minimize heat transfer by conduction or convection from the outer wall surfaces of the inner structure. Also, the fibrous covering material provides a means for causing plaster to readily adhere to the outer surface of the insulating board or block, the fibrous covering being preferably of a somewhat soft, rough or porous nature on its outer surface so that plaster when applied to the covering will strongly adhere to the same.

In order to provide means for indicating the seams or joints; that is, the location of the flanges and the abutting ribs of the inner structure of my improved board, the outer fibrous covering 5 is provided with cutting grooves 6 which, as shown in the drawing, extend along the center line of the abutting ribs. Thus, should it be desired to cut the improved board into smaller sections, the grooves 6 will serve as a cutting guide so that the cutting operation will not break into or open any of the vacuum chambers or cells 1. Also, preformed holes 7 are drilled through the board at intervals along the grooves 6 for nailing purposes so that the boards may be fastened in place without any of the fastening nails puncturing the cells 1.

It will now be seen that my improved insulation board comprises a readily divisible board of block containing self-formed chambers or cells which provide the principal means for resisting and preventing the transfer of heat through the board, the particular advantages of the construction being that the board or panel may be cut into sections without destroying the insulating function of any of the cells. Other advantages will be found in that the nature of the improved construction will permit the board to be made in either curved or flat forms to conform to whatever surface against which the board is to be used as an insulating medium.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims:

1. An insulating board comprising a hollow air-tight inner shell having opposite transversely-extending and inwardly-projecting flat surfaced ribs arranged to abut each other, said ribs being mutually joined and hermetically sealed against their abutting flat surfaces to divide said inner shell into individually sealed sections, and a fibrous plaster-adhering outer covering secured upon and completely enclosing said inner shell.

2. An insulating board comprising a hollow air-tight metal inner shell having opposite transversely-extending and inwardly-projecting flat surfaced ribs arranged to abut each other, said ribs being mutually joined and hermetically sealed against their abutting flat surfaces to divide said inner shell into individually sealed sections, and a fibrous plaster-adhering outer covering secured upon and completely enclosing said inner shell.

3. An insulating board comprising a hollow air-tight inner shell having opposite medially-disposed transversely-extending and inwardly-projecting flat surfaced ribs arranged to abut each other, said ribs being mutually joined and hermetically sealed against their abutting flat surfaces to divide said inner shell into individually sealed sections, and a fibrous plaster-adhering outer covering secured upon and completely enclosing said inner shell.

4. An insulating board comprising a substantially rigid hollow air-tight inner shell having opposite transversely extending and inwardly-projecting flat surfaced ribs arranged to abut each other, said ribs being mutually joined and hermetically sealed along their abutting flat surfaces to divide said inner shell into individually-sealed sections, and an outer covering of matted fibrous material secured upon and completely enclosing said inner shell.

5. An insulating board comprising a hollow air-tight inner shell having opposite transversely-extending and inwardly-projecting flat surfaced ribs arranged to abut each other, said ribs being mutually joined and hermetically sealed against their abutting flat surfaces to divide said inner shell into individually-sealed sections, and a plaster-adhering outer covering of heat insulating material secured upon and completely enclosing said inner shell, said outer covering having means on the outer surface thereof and extending medially along the abutting flat-surfaced ribs of the said inner shell to indicate the position of said ribs.

6. An insulating board comprising a hollow air-tight inner shell formed of marginally flanged pan-like members set face to face with the flanges in mutual abutment, said pan-like members having transversely-extending and inwardly-projecting flat-surfaced ribs arranged to abut each other when said pan members are set face to face, and said ribs and said flanges being mutually joined and hermetically sealed along their abutting flat surfaces to divide said inner shell into individually-sealed cells, and an outer covering of relatively soft fibrous insulating material secured upon and completely enclosing said inner shell.

7. An insulating board comprising a stiff substantially rigid hollow air-tight unitary inner core arranged to provide a plurality of spaced non-communicating cells disposed side by side in the plane of the said board, said cells being each hermetically sealed, and a plaster-adhering outer cover of fibrous heat insulating material secured fast upon all surfaces of and completely enclosing said hollow inner core, all arranged to form a unitary flat surfaced board-like structure.

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