Sept. 23, 1958 E. R. AMUNDSON 2,852,933

INSULATED HOLLOW BLOCK WALL

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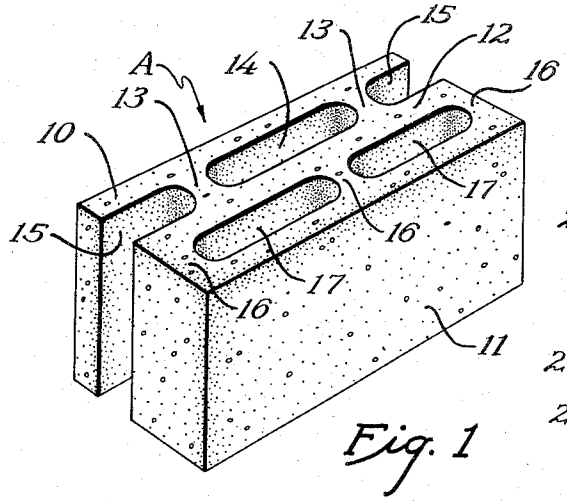


Fig. 1

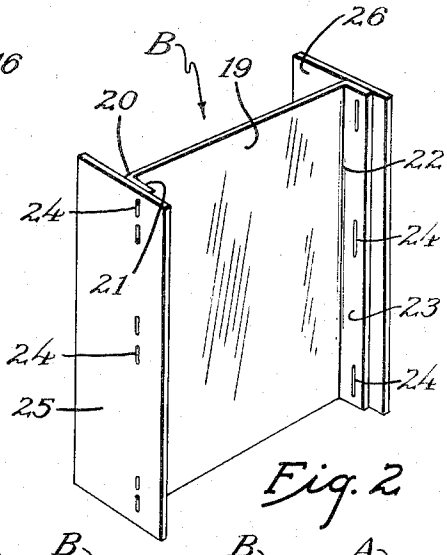


Fig. 2

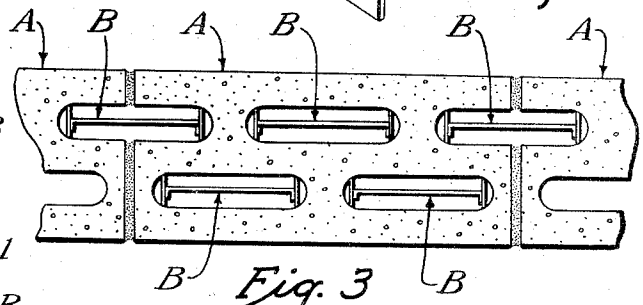


Fig. 3

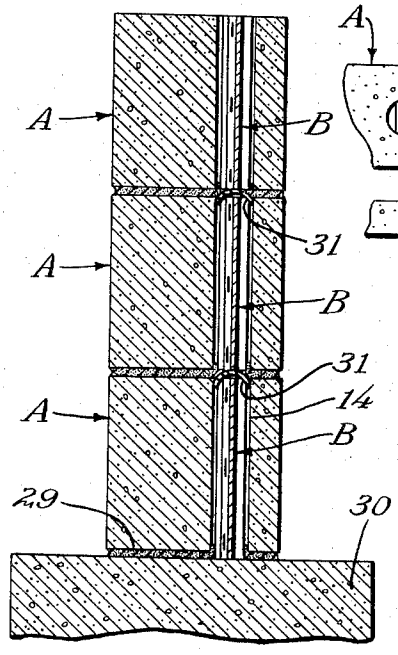


Fig. 4

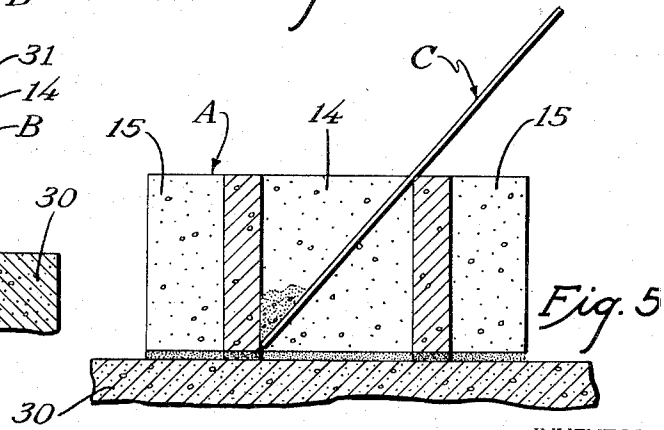


Fig. 5

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INSULATED HOLLOW BLOCK WALL

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5 Claims. (Cl. 72—41)

My invention relates to an improvement in concrete block wall construction and deals particularly with a type of wall in which the air spaces within the wall are insulated.

Many attempts have been made to produce concrete block walls which are relatively non-conductive of heat. In certain of these instances, slabs or blocks have been secured in spaced relationship by connecting elements. While walls constructed of these slabs do not conduct heat as well as ordinary concrete block walls, the air space between the inner and outer slabs does not provide the most effective insulation. It is to improve the thermal qualities of such a wall that the present invention is particularly designed.

A feature of the present invention lies in the provision of a wall having inner and outer layers of material connected together by suitable connecting means. A panel of aluminum or similar heat reflective sheet is supported between the walls in spaced relation thereto. This sheet has the ability of reflecting heat which tends to pass through the wall, thus considerably increasing the thermal efficiency of the wall.

A feature of the present invention lies in the manner in which the aluminum foil or similar material is protected from the walls. The lime usually present in concrete blocks and similar building blocks tends to have a deleterious effect upon the aluminum foil. It is therefore desirable to prevent contact between the concrete and the foil. My structure is so arranged as to prevent actual contact between the foil and the concrete of the blocks.

An added feature of the present invention lies in the provision of a simple insulating panel, preferably formed of aluminum foil laminated to water-proof paper board, or other suitable material. The foil is preferably laminated to both sides of the base. Means are provided for spacing the foil from the block so that actual contact between the concrete and the foil will not occur.

An added feature of the present invention lies in the provision of an insulating panel having a pair of spacing members connected to opposite ends thereof. These spacing members are designed to hold the foil laminated material in spaced relation to the concrete of the building blocks, thus preventing injury to the foil.

Another feature of the present invention lies in the provision of a concrete block which is so shaped as to provide overlapping apertures longitudinally of the block. The foil acts to reflect heat rays back in the general direction from which they come. By providing a block with overlapping apertures in spaced relation and by placing heat reflective panels in these apertures so that the reflectvie panels also overlap, the insulation is substantially continuous throughout the length of the block. Furthermore, by providing staggered overlapping apertures in the block, the heat conductivity through the block is also decreased.

An added feature of the present invention lies in the provision of a means for spacing the heat reflective panels of one block from the panels of another block of a different tier of blocks, thereby providing a series of sealed air spaces in the blocks which are for the most part, separate from one another.

These and other objects and novel features of my

invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a perspective view of a building block in which my heat insulating panels are used.

Figure 2 is a perspective view of a heat reflective panel of the type used in conjunction with the blocks shown in Figure 1.

Figure 3 is a top plan view of a block of the type shown in Figure 1 having the heat reflective panels supported therein.

Figure 4 is a vertical section through a series of superimposed blocks showing the manner in which the panels of one tier of blocks is separated from the panels of the next adjacent tier.

Figure 5 is a sectional view through a block showing diagrammatically the manner in which excess mortar may be scraped from the block aperture so as to prevent actual contact with the insulating panel.

The concrete block which I prefer to employ in my construction is indicated in general by the letter A. The block A is shown as having an outer panel **10**, an inner panel **11**, and an intermediate panel **12**. These panels are arranged in spaced parallel relation. The block is reversible in practice and the panel **11** may serve as the outer panel, while the panel **10** serves as the inner panel.

The panel **10** is separated from the intermediate panel **12** by connecting webs **13** which space the two panels apart and which form an intermediate aperture **14** and a pair of aligned partial apertures **15**. The apertures **15** of adjacent blocks form a single continuous elongated aperture of the same size as aperture **14** when the blocks are placed end to end.

The central panel **12** is separated from the panel **11** by connecting webs **16**. These webs **16** divide the space between the panels into spaced elongated apertures **17**. It will be noted that the connecting webs **13** are offset from the webs **16** so that the apertures **14** and **15** overlap the apertures **17**. Thus there is no continuous connection directly through the block from the panel **10** to the panel **11** and heat must be conducted in a zigzag path in order to pass through the block, thus elongating the travel distance.

In Figure 2 of the drawings I disclose a heat insulating panel which is indicated in general by the letter B. The panels B are designed for insertion in the apertures **14**, **15** and **17** as will be later described in detail. The insulating panel B includes a panel or web **19**, which is preferably formed of aluminum foil or similar metal foil laminated to both sides of an intermediate web of paper board or the like. The paper board is preferably moisture resistant so as not to be injured by a certain amount of moisture absorption. The foil coating on both sides of the panel **19** acts to reflect heat in either direction from the panel.

The panel **19** is foldably connected at **20** to an end flange **21**. The central panel **19** is similarly foldably connected along a fold line **22** to an end flange **23**. The flanges **21** and **23** are stitched or otherwise secured as indicated at **24** to a pair of spaced supports **25** and **26**. The supports **25** and **26** may be formed of moisture resistant paper board or other suitable material and may fold flat with relation to the central panel **19** when the insulating panel is not in use. In actual use the end supports **25** and **26** are folded into substantially parallel relation and extend at substantially right angles to the plane of the center panel **19**.

In Figure 3 of the drawings I disclose in general the manner in which the insulation panels B are inserted into the concrete blocks A. It will be noted that the center portion **19** of the panels B is slightly shorter than the total length of the apertures **14**, **15** and **17** so that the

supports 25 and 26 bridge across the rounded ends of these apertures. It will also be noted that the edges of the strips 25 and 26 contact the walls of the apertures so as to hold the foil laminated center portion 19 as well as the end flanges 21 and 23 in spaced relation to the walls of the apertures. Thus there is no actual contact between the foil and the concrete of the blocks so that the foil will not be injured through contact.

Figure 4 of the drawings illustrates more completely the manner in which the insulation panels B are supported in superimposed tiers of blocks A. In building a wall of the blocks A, a layer of mortar 29 is placed upon the footing 30 and the lowermost tier of blocks is placed in end to end relation on the mortar. When the lowermost tier of blocks is in place a tool C of the type illustrated in Figure 5 of the drawings is used to remove superfluous mortar from the footing 30 at the base of the apertures 14, 15 and 17. The tool C comprises an elongated strip of band iron or other suitable material which is designed to scrape the mortar from the surface of the footing and to permit its removal by tilting the tool in the manner illustrated in Figure 5, and elevating the lower end together with the mortar resting upon the surface of the tool. This permits the panel B to rest directly upon the footing 30 between the walls of the apertures in which they are positioned.

After the panels B have been inserted in all of the various apertures cap strips 31 are placed above each of the insulating panels as best illustrated in Figure 4. The cap strips 31 are formed of moisture resistant paper board or other suitable material and are slightly wider than the apertures in which they are placed. As a result the cap strips are curved slightly as they are inserted so that the sides of the cap strip engage the walls of the aperture and form a closure for each opening. These cap strips 31 also protect the foil from engagement with the concrete of the blocks.

One such cap strip 31 may, if desired, be placed beneath the aperture of each block in the lowermost tier of blocks to prevent contact of the foil with the footing when the footing is formed of concrete containing lime, or other ingredients, having a deleterious effect on the foil.

After the cap strips 31 of the lowermost tier are in place, mortar is spread upon the upper surfaces of these blocks and the next tier of blocks A is laid. The second tier of blocks is usually staggered relative to the first layer as is common practice to provide a wall of maximum strength. When the blocks of the second tier are in place the tool C is used to scrape excess mortar from the top of the cap strip 31 of the first layer of blocks and an insulating panel B is inserted in each aperture of the blocks of the second tier.

This same procedure is followed with the blocks of each tier. It will be noted that as a result the cells in each block are individually sealed and thus provide more effective insulation. From an observation of Figure 3 of the drawings it will be obvious that the insulation panels B are arranged in overlapping relation so that heat rays cannot pass directly through the block without striking an insulation panel B. These panels tend to reflect such heat rays, thereby limiting the transfer of heat through the block.

It will also be noted that heat which is conducted through the block must travel in a ziz-zag path in order to pass from one wall surface to the opposite wall surface, thereby increasing the effectiveness of the block from a heat transfer standpoint.

In accordance with the patent statutes, I have described the principles of construction and operation of my concrete block wall construction, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. In combination a concrete building block of substantially standard size and material formed with a plurality of overlapping oval apertures having smoothly-rounded end walls without grooves therein and extending in spaced staggered relationship longitudinally of the block, said apertures having inserted therein self-sustaining flexible laminated insulating panels, having a central heat reflective section on each side thereof longitudinally bridging the block aperture supported by protective end sections freely compressed against the normally smoothly-rounded curvature of the oval ends of said aperture, and said end sections being unattached to the walls of said aperture and insulating the said heat reflective central section from contact with the concrete of the building block.

2. The structure of claim 1, including in combination flexible cap strips overlying a plurality of said self-retaining flexible insulating panels and closing each of said apertures containing said panels.

3. The structure of claim 1, wherein said central section is a thin flexible laminated self-supporting aluminum foil material and the protective end sections are connected by fold lines to said central section to provide frictional anchoring flanges for supporting said central section without auxiliary fastening attachments.

4. In combination a reversible concrete block of standard size and material formed with a plurality of overlapping apertures in staggered spaced relationship longitudinally of the block, said apertures having independently inserted therein self-sustaining thin laminated self-supporting flexible metal foil panels having a central section and end sections longitudinally bridging the apertures and supported therein in spaced relationship to the concrete walls of said apertures by the end sections thereof in compressed frictional engagement against opposite faces of said aperture walls, and closure caps overlying said thin flexible metal foil panels and closing the ends of the apertures in said reversible concrete blocks.

5. An insulated concrete block wall formed of substantially standard size reversible concrete blocks laid with mortar in independent staggered tiers comprising in combination at least one tier of concrete blocks having a plurality of apertures with overlapping ends in staggered spaced relationship extending longitudinally of the tier, a plurality of independently mounted thin laminated metal foil self-sustaining flexible heat reflective insulating panels substantially centered within said apertures and spaced from the walls thereof by flexible ends frictionally engaging against opposite walls of said apertures, closure caps in said apertures overlying said panels, and another independent tier secured in staggered relationship to said first tier and provided with a plurality of similar apertures, a further similar set of a plurality of independently mounted thin self-sustaining flexible heat reflective insulating panels mounted in said similar apertures in spaced and staggered relationship with overlapping ends relative to said panels in said one tier, and aditional closure caps in said similar apertures overlying said further similar set of panels and in relatively staggered relationship to the said closure caps in said one tier.

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