Aug. 15, 1950 J. B. PURINTON 2,518,640

INSULATED BUILDING BLOCK

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FIG. 1.

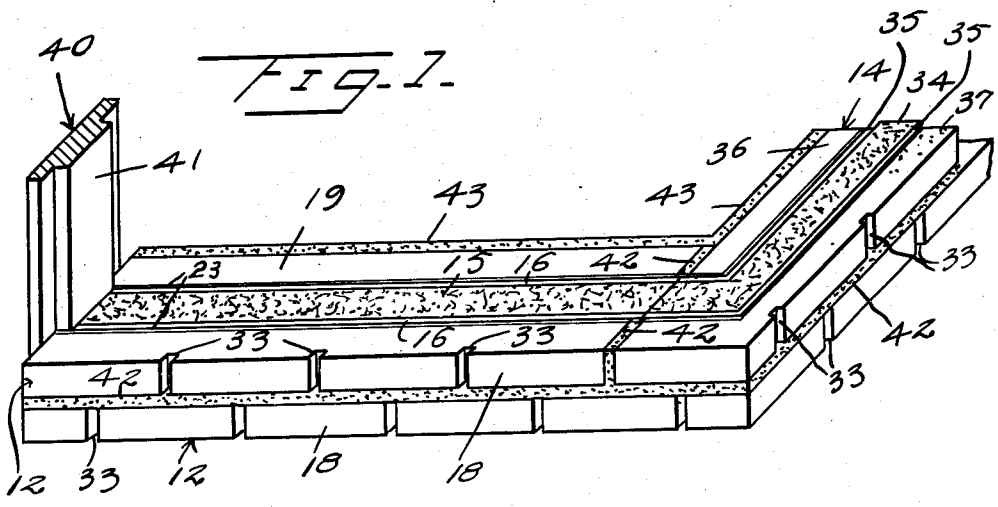


FIG. 3.

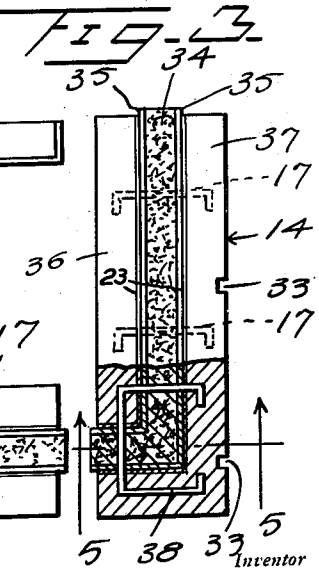


FIG. 4.

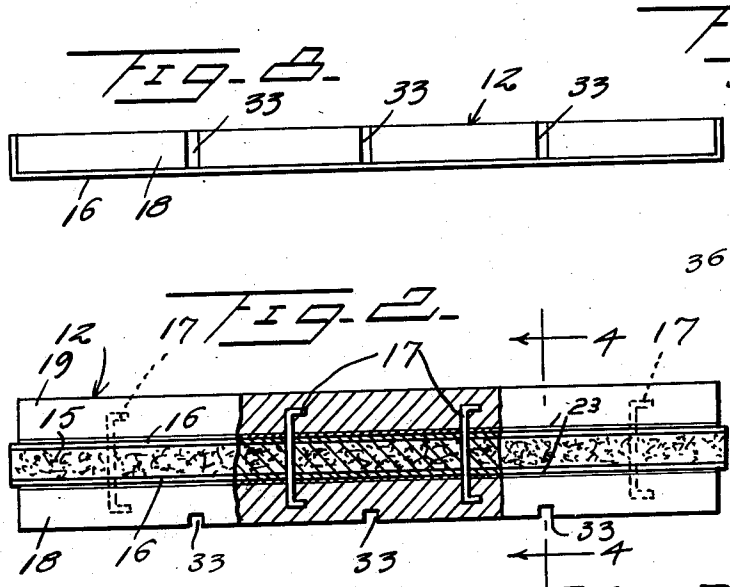
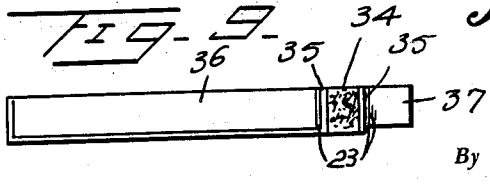


FIG. 2.

FIG. 5.



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FIG. 4

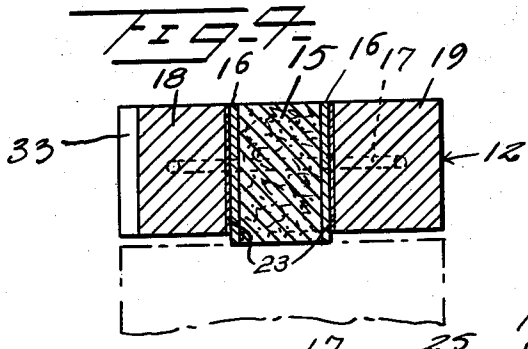


FIG. 5

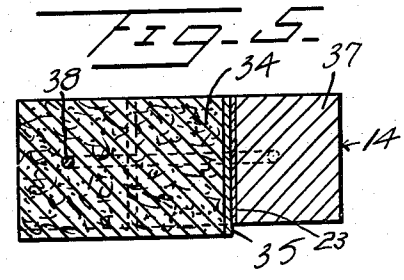


FIG. 6

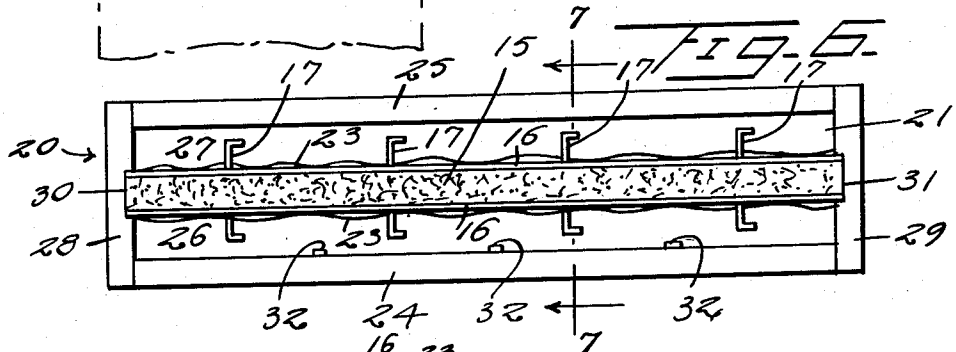


FIG. 7

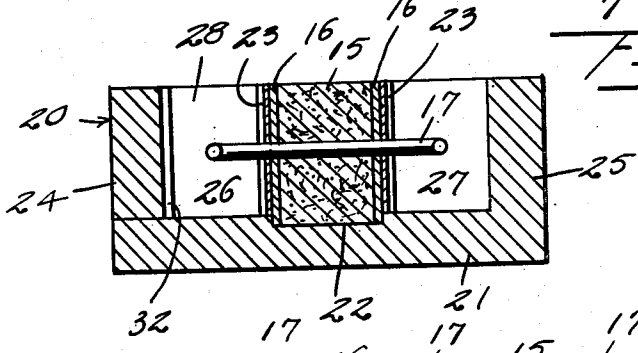
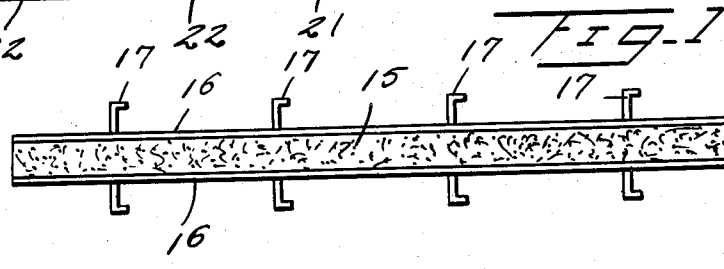


FIG. 10



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INSULATED BUILDING BLOCK

John B. Purinton, Cumberland, Md.

Application January 11, 1946, Serial No. 640,514

3 Claims. (Cl. 72—44)

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This invention relates generally to composite insulation units suitable for use in building walls and partitions, refrigeration and frozen storage units and structures, heat processing rooms, sound regulating rooms, and the like. More specifically, the present invention is directed to insulated building blocks and wall constructions formed therefrom.

It is generally known that concrete, brick and the like building materials have low insulation values and that heat and moisture will pass through solid portions of cored blocks where the outer and inner walls conjoin with webs, particularly in corners of walls where provisions have not been made for a continuous and protected insulation filler.

Frequently, for the purpose of insulating masonry walls, the insulation material is blown into the open cells after the wall is completed, or the insulation material is placed loosely in the open cores as the blocks are laid on the wall or openly fitted between the webs and through the cores thereof.

It is also usually the custom to attach wood furring strips to the blocks on the inner side of masonry walls to receive the plaster which thus forms the innermost or finished wall.

In accordance with the arrangement of the present invention, a composite insulated building block or unit is provided with a central mat or mattress of a suitable insulating material such, for example, as mineral wool which is planked or blanketed on each side with a vapor barrier formed of a thin flexible sheet of metal, cellophane or moisture-proof building paper. Blocks of cement or plastic materials are molded or otherwise formed adjacent the vapor barriers and the composite unit secured together by means of lateral tie-bars or tie-arms which extend through the mat and barriers and are anchored to the blocks by being molded therein. The outer or weather face of the unit is indented or otherwise formed according to a predetermined pattern during the molding process to simulate a plurality of bricks or cast stones with mortared joints or pointing therebetween.

The unit or block thus constructed may also readily be formed in right angular or other bends due to the flexible character of the components thereof and the ease with which molds may be provided to form the cement or plastic block components associated with the bent mat and barriers in such case.

In some cases it is desirable to provide a thin sheet of permeable paper loosely laid against, adjoining and paralleling the outer vapor barrier sheet in order to permit moisture to collect in the small free space between the plastic or cement block and the paper wherein expansion due to freezing will be taken up by the flexible vapor barrier and the mat and thereby avoid damage to the block. The paper, for such purpose, should be adapted to freely pass moisture while at the same time being adapted to prevent green cement from adhering to the vapor barrier sheet.

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It is a broad object of the present invention, therefore, to provide a new and improved composite insulated building block which may be used to form a wall construction having a uniform thickness and continuous length of insulation material around the corners and throughout the length thereof.

Another object is to provide an insulated building block for use in forming a wall construction which is vapor-sealed in its entirety by reason of overlapping of adjacent insulation mats and vapor-barriers upon assembly of the blocks.

Another object is to provide an insulated building block which will not be damaged due to expansion upon freezing of accumulated moisture within the block.

A further object is to provide an insulated block to which plaster may be applied directly.

A still further object is to provide a composite insulated block which may be constructed of conventional building materials, which will be relatively light in weight, economical to manufacture, and susceptible of multi-various architectural facial designs.

An additional object is to provide a composite insulated unit which may have a wide field of application for architectural, acoustical, and other industrial purposes and in which the thickness of the insulation mat may be varied readily to provide the desired heat or sound transfer or exchange values.

Still other objects, features and advantages of the present invention are those inherent in the novel construction, combination and arrangement of the parts as will become clearly apparent from the following detailed description of a preferred embodiment of the invention, reference being had to the accompanying drawings wherein:

Figure 1 is a perspective view illustrating the manner in which the several blocks, constructed according to the preferred embodiment of the

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invention, may be laid to form a wall having a door or window frame fitted therein.

Figures 2 and 3 are plan views, partly in section, illustrating the construction of straight and corner blocks, respectively.

Figures 4 and 5 are sectional views as seen along the lines 4—4 and 5—5 of Figures 2 and 3, respectively.

Figure 6 is a plan view of a mold for a straight block and illustrating the manner of mounting the mat, vapor barriers and paper therein.

Figure 7 is a section taken along the line 7—7 of Figure 6.

Figure 8 is a view in elevation of a straight block as viewed on the outer side thereof.

Figure 9 is a view in elevation of a corner block as viewed on the inner side thereof; and

Figure 10 is a plan view of the sub-assembly including the mat, vapor barriers, and anchoring arms.

Referring now to the drawings wherein like characters of reference refer to like parts throughout the several views, it will be seen that each composite insulated block or unit generally designated 12 for the straight type comprises an elongated rectangular mat 15 of fibrous mineral wool or like insulating material which is flanked and held intact by thin flexible vapor-proof sheets or barriers 16 of metal or other material suitable for the purpose. Metal arms 17 having L-shaped ends are passed through the mat and vapor-proof barriers and are extended laterally to each side thereof, the L-shaped ends of arms 17 being employed to anchor the arms in the cement or plastic blocks 18 and 19 molded adjacent to the vapor-proof barriers.

The numeral 20 generally designates a mold which is suitable for forming the straight blocks 12. The mold comprises a bottom board 21 having a longitudinal groove 22 formed therein to receive mat 15 and barrier plates 16 disposed adjacent thereto. A sheet of permeable paper 23 is placed adjacent each barrier plate 16 to prevent adhesion between the vapor barriers and the cement or plastic blocks during the molding process. The mat and vapor barriers divide the mold between the two sides 24 and 25 thereof into two compartments 26 and 27 into which arms 17 project. Thus, when end boards 28 and 29 are in place on the mold and the compartments are filled with cement or plastic, the inner and outer blocks 19 and 18 are formed therein after hardening of the molded material and the several components are held together as a unit by the arms 17 which become molded in the blocks.

The portion of the mat and its associated vapor barrier portions which lie within groove 22 of the mold, and also those portions which lie within similar grooves 30 and 31 formed in end boards 28 and 29 respectively, project from the finished block by an amount corresponding substantially to the amount of mortar employed between adjacent blocks when forming a wall. Thus, a complete and continuous insulation and vapor barrier is provided from block to block throughout the entire height and breadth of the wall.

Cleats 32 are provided on side boards 24 to form indents 33 in the finished outer block 18, the indents being formed for the purpose of receiving mortar thereinto, thereby to simulate the pointing in joints between bricks.

It will be readily understood that by making slight changes in mold 20 that a mold may be provided adapted to form therein the corner block generally designated 14. Block 14 may be

generally similar to block 12 except that the mat 34 and vapor barrier 35 thereof are bent at right angles near one end of the block so as to project outwardly of the inner molded block 36 adjacent the end thereof, the outer molded block 37 being L-shaped on the end thereof adjacent to the bend in the mat and the vapor barriers. A substantially C-shaped anchoring arm 38 preferably is employed in the corner of block 14 to insure adequate strength at that point, arms 17 otherwise being employed throughout the length of block 14 which in other respects also is similar to straight block 12.

Blocks 12 and 14 are preferably molded to a size that one man can handle and are laid in the wall similarly to the manner in which the usual concrete blocks are laid, the manner of assembly of a wall being illustrated in Figure 1. A frame 40 of a window or door is shown fitted into the blocks, the tongue portion 41 of the frame conveniently occupying the space otherwise fitted by the mat 15 and its associated vapor barriers 16. Mortar 42 is applied between adjacent blocks and is also applied (not shown) in the indents 33 to simulate pointing between adjacent simulated bricks. Plaster 43 is applied directly to the inner faces of the blocks.

From the foregoing it should now be apparent that a building block has been provided which is well adapted to fulfill the aforestated objects of the invention. Moreover, it will be understood that, while but a single embodiment of the invention has been described in particularity, changes and modifications thereof may be resorted to without departing from the spirit and scope of the invention as defined by the appended claims.

What I claim is:

1. A composite insulated building block of the character disclosed comprising, in combination, a rectangular mat of insulation material, a pair of thin flexible vapor barrier sheets formed of moisture-proof material and disposed adjacent to said mat on opposite sides thereof coextensive therewith, a pair of thin sheets of moisture permeable material respectively disposed adjacent the outer surfaces of said vapor barrier sheets, a pair of facing members respectively molded adjacent to the outer surfaces of said pair of moisture permeable sheets, and a plurality of anchoring members projected laterally through said mat, vapor barrier sheets, and moisture permeable sheets and having end portions respectively embedded in said facing members for permanently binding the mat, vapor barrier sheets, moisture permeable sheets, and facing members together as a unit.

2. An insulated wall structure of the character disclosed comprising, in combination, a plurality of pairs of molded inner and outer facing members respectively mortared together to form continuous inner and outer walls, a plurality of rectangular mats of insulation interposed respectively between each pair of said inner and outer facing members and in abutting relation with respect to each other thereby to form a continuous insulation mat between said inner and outer walls, a plurality of pairs of thin flexible vapor barrier sheets individual to said plurality of mats and respectively disposed adjacent opposite sides thereof and coextensive therewith thereby to form continuous inner and outer vapor barriers for said continuous mat, a plurality of pairs of thin sheets of moisture permeable material individual to said pairs of inner and outer facing members

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and disposed adjacent the inner surfaces thereof, and a plurality of anchoring arm members for each pair of said inner and outer facing members and having their ends embedded respectively therein thereby to bind each pair of inner and outer facing members and the mat, vapor barrier sheets, and moisture permeable sheets individual thereto together as a permanent unit.

3. A composite insulated building corner block of the character disclosed having an angle portion and comprising, in combination, a rectangular mat of insulation material, a pair of thin flexible vapor barrier sheets formed of moisture-proof material and disposed adjacent to said mat on opposite sides thereof and coextensive therewith, said mat and vapor barrier sheets being bent as a unit at an angle to form said angle portion of said corner block, a pair of thin sheets of moisture permeable material respectively disposed adjacent the outer surfaces of said vapor barrier sheets, a pair of facing members respectively molded adjacent to the outer surfaces of said moisture permeable sheets, and a plurality of C-shaped anchoring arms projected laterally through said mat, vapor barrier sheets, and moisture permeable sheets and having end portions

respectively embedded in said facing members, one of said C-shaped arms having portions thereof respectively projected laterally through the legs forming said angle portion thereby to strengthen the corner block in the angle portion thereof.

JOHN B. PURINTON.

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