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V. A. BARNHART

2,199,946

BUILDING UNIT

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Fig. 1.

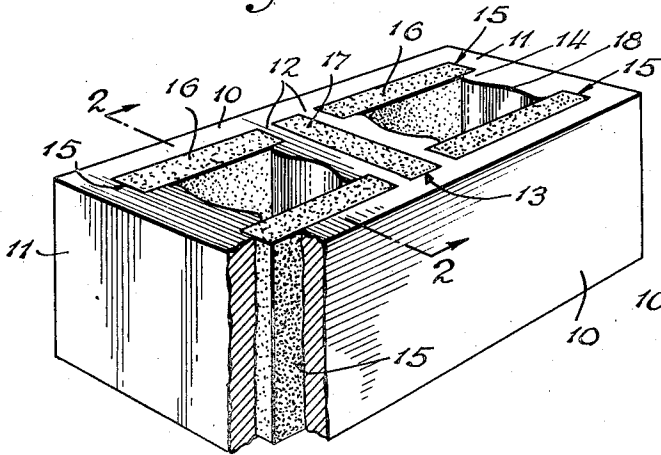


Fig. 2.

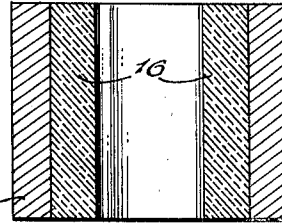


Fig. 3.

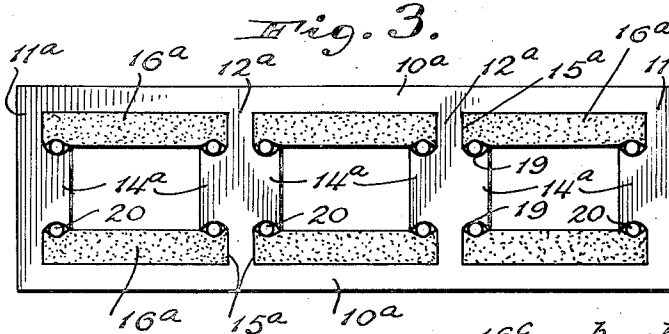


Fig. 4.

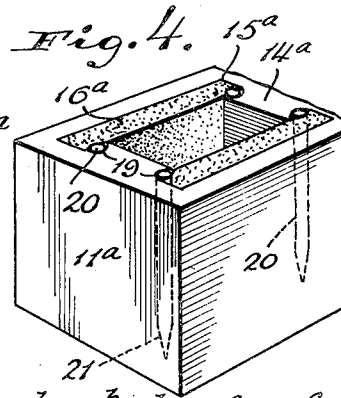


Fig. 5.

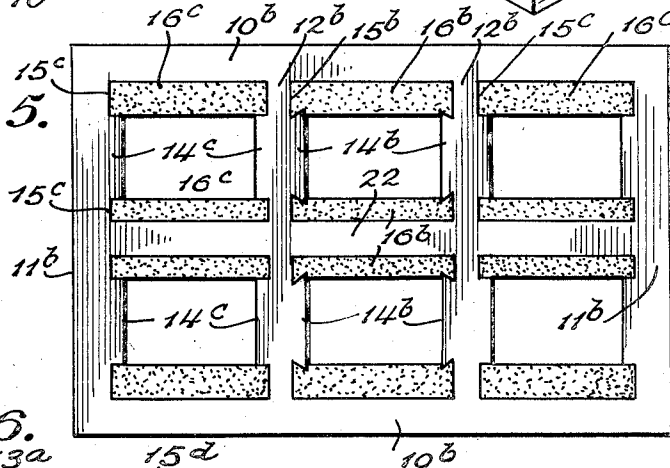
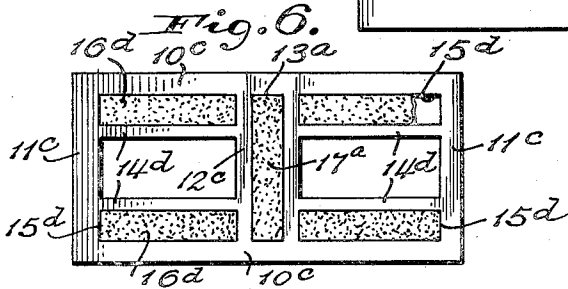


Fig. 6.



INVENTOR
VERN A. BARNHART
BY
John Archambault
ATTORNEY

UNITED STATES PATENT OFFICE

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BUILDING UNIT

Vern A. Barnhart, Chester, N. J.

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10 Claims. (Cl. 72-41)

My invention relates to building units of the so-called hollow tile type and more particularly to burned-clay building units of a hard, vitreous nature. While properly burned-clay units are highly resistant to fire, include highly impervious surfaces, and present other material advantages, said units at the same time include disadvantages such as little absorption and consequent inability to properly grip the associated mortar, and lack of insulating properties against sound, heat and cold, which reduce the utility thereof to a considerable extent.

The object of my invention is to provide building units and more particularly impervious clay building units constructed in a novel manner to insure efficient insulation against heat, cold and sound, and to afford mortar beds of suitable absorption to provide efficient bonding.

Other more specific objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawing which illustrates examples of the invention without defining its limits, Fig. 1 is a perspective view, partly broken away, of one form of the novel unit; Fig. 2 is a sectional view thereof on the line 2-2 of Fig. 1; Fig. 3 is a plan view of another form of the novel unit; Fig. 4 is a fragmentary perspective view thereof; Fig. 5 is a plan view of a further form of the novel unit, and Fig. 6 is a plan view of still another form of the novel unit.

In describing the novel building unit, it will be assumed that the shell or body thereof is constructed of a material which, in the finished condition of the block, is inherently deficient in absorption properties and which likewise is inherently deficient in temperature and sound insulating properties; that is to say, the shell or body of the unit may be constructed of vitrified clay which, in the finished condition of the unit, is hard and dense and does not develop an efficient grip upon the associated mortar when incorporated in a masonry structure such as a wall or the like, and in addition does not rate very highly in the matter of providing insulation against heat, cold and sound. Such building units provide finished faces which enable said units to be used to form the exposed faces of walls or the like, either interior or exterior, and which are highly impervious to the action of the elements. It will be understood, however, that the above explanation is not intended to define the limits of the invention and that the novel features are capable of being embodied in other types of building units which in such case are improved thereby.

In its simplest form, the building unit comprises a hollow open body or shell of conventional rectangular form consisting of parallel side or longitudinal walls 10 and transverse end walls

11; as shown in Fig. 1, the shell or body includes an internal transverse wall 12 which divides said body or shell interiorly into open ended cells located adjacent to each other as illustrated. In the specific form shown, the transverse wall 12 is provided with an open ended recess 13 extending through said unit to the opposite faces thereof.

In the type of unit for which the novel features are particularly adapted, the shell or body in its finished condition is inherently deficient in absorption properties and furthermore, because of the thinness of its walls, does not include efficient mortar gripping surfaces; in addition, units of the indicated class do not provide efficient insulation against sound, heat and cold.

To overcome the above-mentioned deficiencies, the novel building unit in all of its forms, is provided with sections of absorbent material which not only supplement the width of the end faces of the walls of the unit to provide adequate mortar beds, but also impart to said units the desired qualities of insulation against sound, heat and cold; any suitable materials capable of being molded or otherwise fabricated to provide elements capable of being handled, may be used in the production of the aforesaid sections. In other words, the sections of material in their final form not only absorb moisture but are further absorbent in the sense that they possess insulating properties as above set forth. In practice, the sections may correspond to those materials commercially known for instance as Thermax, Insulite, or Celotex.

To provide the desired novel construction in a simple and economical manner, the unit in all of its forms is formed interiorly of the body with a plurality of members projecting in spaced parallel relation to predetermined inner faces of said unit to form recesses in which the aforesaid sections of absorbent material are slidably accommodated in surface engagement with said inner faces and preferably so as to terminate flush with the end faces of the walls of said unit.

In the unit illustrated in Figs. 1 and 2, the aforesaid members comprise ribs 14 which project from the inner faces of the transverse walls 11 and 12; the arrangement is such that the ribs 14 extend in directions toward each other in opposed pairs and to form recesses 15 contiguous to the inner faces of the opposed longitudinal walls 10 of said unit. In some forms of the unit, the recesses 15 may be located along the inner face of only one of the longitudinal walls 10, although the construction illustrated in Fig. 1 represents the preferred arrangement in this respect. The recesses 15 of the form being described are dimensioned and located to receive the opposite end portions of preformed sections 16 of absorbent material, the latter being dimensioned to fit between the bottom walls of op-

posed recesses 15 and of a transverse thickness to snugly fit the recesses 15 themselves. In the preferred construction, the recesses 15 extend entirely through the body of the unit and terminate flush with the end faces of the walls thereof as shown in Fig. 2; it will, of course, be understood that if desired the recesses 15 in this respect may be otherwise arranged. The frictional fit of the opposite ends of the sections 16 in the recesses 15 alone may be relied upon to maintain said sections 16 in place, or additional means may be provided for this purpose as will appear more fully hereinafter. In the building unit shown in Fig. 1, an additional section of absorbent material 17, similar to the sections 16, may be inserted into the recess 13 and in such case is dimensioned so that said section 17 terminates flush with the opposite end faces of the transverse wall 12 and so as to snugly fit said recess 13. As shown in Fig. 1, the inner surfaces of the ribs 14 are preferably concave as indicated at 18 to provide the open ended interior cells of the unit with at least a partially curved shape in cross-section. When the units of this type are utilized in practice, the aforesaid cells provide flues or conduits useful for many purposes as will be apparent.

The unit shown in Figs. 3 and 4, in addition to the longitudinal side walls 10^a and the transverse end walls 11^a, includes a plurality of intermediate transverse walls 12^a whereby the body of the unit is divided interiorly into a plurality of open ended cells located adjacent to each other as shown. Ribs 14^a project from the transverse walls 11^a and 12^a in directions toward each other and have their side edges concaved as shown at 19. The ribs 14^a are so arranged as to form recesses 15^a corresponding to the previously mentioned recesses 15 and likewise extending in contiguous relation to the inner faces of the opposite side walls 10^a. Sections 16^a of absorbent material are located in surface engagement with the inner faces of the longitudinal side walls 10^a and have their opposite ends positioned in the recesses 15^a in the same way as described with respect to Fig. 1. The sections 16^a of absorbent material terminate flush with the end faces of the respective walls of the unit and preferably extend entirely through the body of said unit, the recesses 15^a being arranged and dimensioned to secure this result. The form of unit now being described includes means for securing the sections 16^a of absorbent material in the recesses 15^a which means is illustrated in the form of pins 20. The latter extend along the concaved side edges 19 of the ribs 14^a and between said edges and the adjacent surfaces of the sections 16^a of absorbent material; the pins 20 are arranged to depress or indent the surfaces of the sections 16^a of absorbent material and serve thereby to firmly fix the ends of said sections 16^a against unintentional removal from the recesses 15^a. To facilitate the introduction of the pins 20, these pins may be pointed at one end as shown at 21 in Fig. 4.

The unit illustrated in Fig. 5, in addition to the longitudinal side walls 10^b and transverse end walls 11^b, includes an internal longitudinal wall 22 and a plurality of intermediate transverse walls 12^b whereby the body of the unit is divided into two parallel series of open ended cells as shown. The intermediate transverse walls 12^b are provided on one face with dove-tailed ribs 14^b dimensioned and located to form recesses 15^b in opposed relation to each other and contiguous

to the inner faces of the longitudinal side walls 10^b and the internal longitudinal wall 22. Ribs 14^c project from the opposite faces of the transverse walls 12^b and from the inner faces of the transverse end walls 11^b and form recesses 15^c in contiguous relation to the inside faces of the longitudinal side walls 10^b and the longitudinal internal wall 22. Sections 16^b lie in surface engagement with the inner faces of the longitudinal side walls 10^b and the faces of the internal longitudinal wall 22 and have their opposite ends inserted in the recesses 15^b as in the previous forms; because of the dove-tailed form of the ribs 14^b, the said ends of the sections 16^b are indented and securely held against unintentional removal from the recesses 15^b. Similar sections 16^c of absorbent material lie in surface engagement with the inner faces of the longitudinal side walls 10^b and the opposite faces of the longitudinal internal wall 22 with their opposite ends located in the recesses 15^c. The sections 16^b and 16^c are preferably arranged and dimensioned to extend entirely through the body of the unit and so as to terminate in substantially flush relation with the end faces of the walls of said unit.

In the unit illustrated in Fig. 6, ribs or members 14^d extend from the inner faces of the transverse end walls 11^c to the opposed faces of the transverse interior wall 12^c in parallel spaced relation to the inner faces of the longitudinal side walls 10^c. With this construction recesses 15^d which preferably extend through the body of the unit are formed in contiguous relation to the longitudinal side walls 10^c and serve to accommodate sections 16^d of absorbent material as in the forms previously described and for the same purpose. The internal transverse wall 12^c may be provided with a recess 13^a corresponding to the recess 13 of Fig. 1 and likewise accommodating a section 17^a of absorbent material.

In all of the forms of the building unit illustrated and described, the preformed sections of absorbent material may be readily inserted into the associated recesses and when in place not only provide the unit with the desired insulating properties, but also serve to supplement the transverse width of the end faces of the walls of said units to provide adequate mortar beds. With the novel constructions shown and described, the walls of said unit may be reduced to a minimum thickness, for instance, as small as one-quarter inch, and by the addition of the sections of absorbent material such as 16, provide efficient mortar beds for securing adequate bonding with the mortar and for also providing the desired inherent insulation in the unit. The tightness of the bond provided between units by the mortar bonding insulating material exemplified by the sections such as 16, will eliminate the fine hair cracks now prevalent in most clay walls between mortar and impervious units, which cracks when present permit considerable heat and cold transmission through said units and also enable sound to pass therethrough.

If desired, the novel units may include a cleavage plane in the center as exemplified by the recesses 13 and 13^a in which sections of absorbent material may also be inserted as shown and described. The sections of absorbent material such as 16 may be inserted into the associated recesses at the particular job on which the novel units are being used to thereby enable the units to be shipped without the absorbent sections whereby the cost of transportation may be reduced, particularly when said units are shipped

to foreign countries; in most cases, however, the sections of absorbent material are added to the units at the place of manufacture.

While the novel features set forth hereinbefore are particularly adapted for use in connection with vitreous building units, said features may be efficiently utilized in connection with building units of other types and in such case will add to the efficiency and improve the construction thereof in approximately the same way as hereinbefore described.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. A building unit comprising a continuous integral shell forming a hollow open ended body, a preformed section of insulating material having one face located in free surface engagement with an inner face of said shell, and means integral with said shell projecting interiorly from a wall thereof in free surface engagement with the opposite face of said section of insulating material to fix the same in said shell

2. A building unit comprising a continuous integral shell inherently deficient in absorption properties and forming a hollow open ended body having walls the end faces of which are too narrow to provide efficient mortar gripping surfaces, preformed sections of absorbent material each having one face located in free surface engagement with an inner face of said shell and terminating substantially flush with said end faces of said walls to supplement the width thereof and thereby provide efficient mortar gripping surfaces, and ribs integral with said shell projecting interiorly from predetermined walls thereof in free surface engagement with the opposite faces of said sections of absorbent material to fix the same in said shell.

3. A building unit comprising a continuous integral shell forming a hollow open ended body, preformed sections of absorbent material having faces located in free surface engagement with predetermined inner faces of said shell, and a plurality of ribs integral with said shell projecting interiorly therefrom in free surface engagement with opposite faces of said sections of absorbent material to fix the same in said shell.

4. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, ribs integral with said shell projecting from the inner faces of the transverse walls of said body to form opposed recesses contiguous to an inner face of a longitudinal wall of said body, and a section of absorbent material having one face in surface engagement with said inner face of said longitudinal wall and having its opposite ends located in said recesses with the intermediate portion of the opposite face of said section of absorbent material exposed to the interior of said shell.

5. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, ribs integral with said shell projecting toward each other in co-operating pairs from the inner faces of opposite transverse walls of said body to form opposed open ended recesses open toward each other contiguous to the inner faces of opposite longitudinal walls of said body, and sections of absorbent material having faces in surface engagement with said

inner faces of said longitudinal walls and having their opposite ends located in said recesses with the intermediate portions of the opposite faces of said sections of absorbent material exposed to the interior of said shell.

6. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, ribs integral with said shell projecting toward each other in co-operating pairs from the inner faces of opposite transverse walls of said body in directions toward each other to form open ended recesses open toward each other contiguous to the inner faces of opposite longitudinal walls of said body, the inner surfaces of said ribs being concave, and sections of absorbent material having faces in surface engagement with said inner faces of the longitudinal walls and having their opposite ends located in said recesses with the intermediate portions of the opposite faces of said sections of absorbent material exposed to the interior of said shell.

7. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, ribs integral with said shell projecting from opposite transverse walls of said body to form opposed open ended recesses contiguous to the inner face of at least one longitudinal wall of said body and open toward each other, a section of absorbent material having a face in surface engagement with said inner face and having its opposite ends located in said recesses with the intermediate portion of the opposite face of said section of absorbent material exposed to the interior of said shell, and means co-operating with said ribs for securing said sections of material in said recesses.

8. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, ribs integral with said shell having concave side edges and projecting from opposite transverse walls of said body to form opposed open ended recesses contiguous to the inner faces of opposite longitudinal walls of said body and open toward each other, sections of absorbent material having faces in surface engagement with said inner faces and having their opposite ends located in said recesses with the intermediate portions of the opposite faces of said sections of absorbent material exposed to the interior of said shell, and pins extending along the concave side edges of said ribs for securing said sections of material in said recesses.

9. A building unit comprising a continuous integral shell forming a hollow open ended body of rectangular form, sections of absorbent material having faces in surface engagement with the inner faces of predetermined longitudinal walls of said shell, and dovetail ribs integral with said shell projecting interiorly from predetermined transverse walls of said shell over the opposite faces of said sections of absorbent material and embedded therein to fix said sections in said shell.

10. A building unit comprising a hollow open ended body of rectangular form, ribs extending between transverse walls of said body in spaced parallel relation to the longitudinal walls thereof to form open ended recesses open toward each other in opposed relation, and preformed sections of absorbent material inserted bodily into said recesses in surface engagement with said longitudinal walls.

VERN A. BARNHART.