July 12, 1938. V. A. BARNHART 2,123,225

BUILDING DEVICE

Filed Feb. 17, 1937 2 Sheets-Sheet 1

Fig. 1.

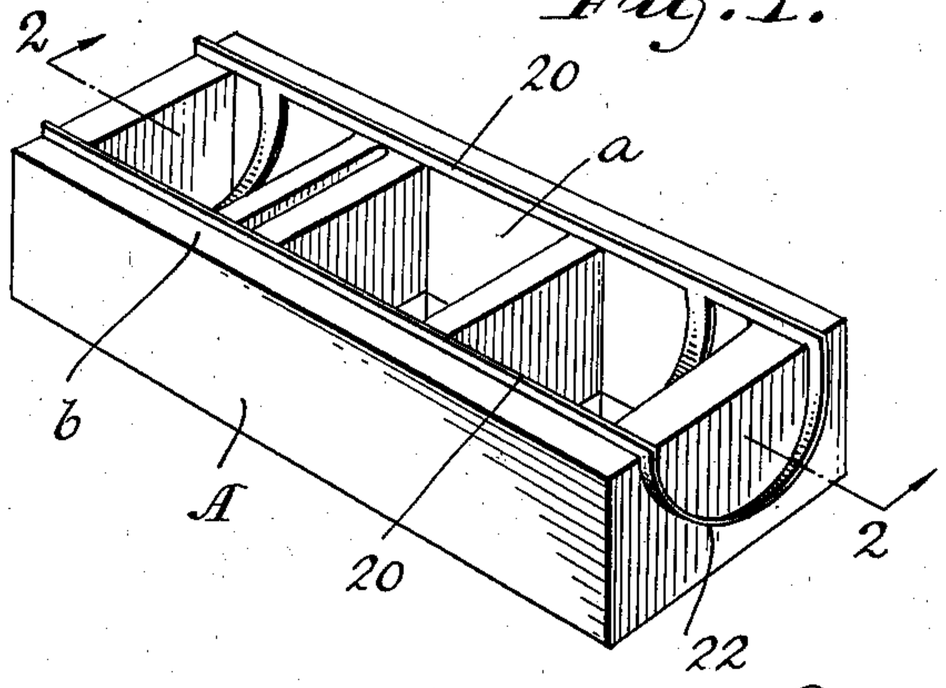


Fig. 5.

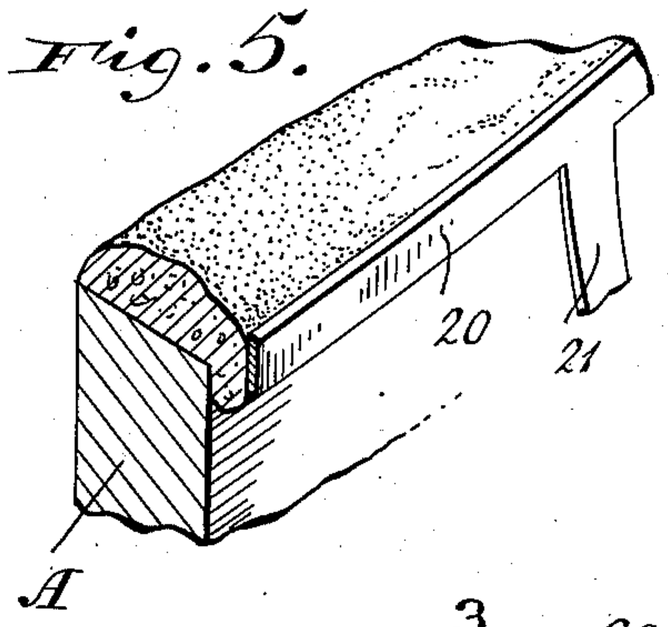


Fig. 2.

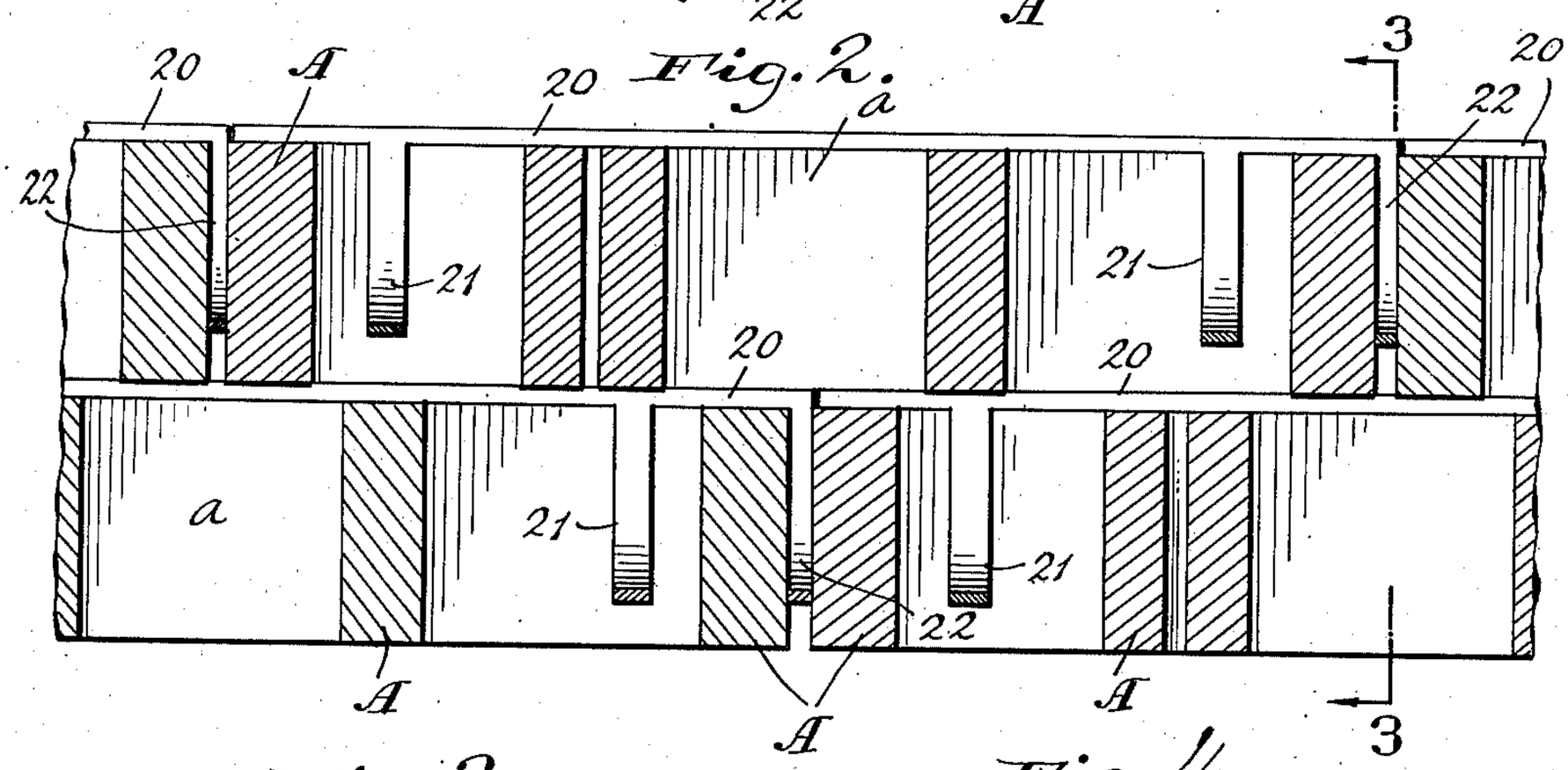


Fig. 3.

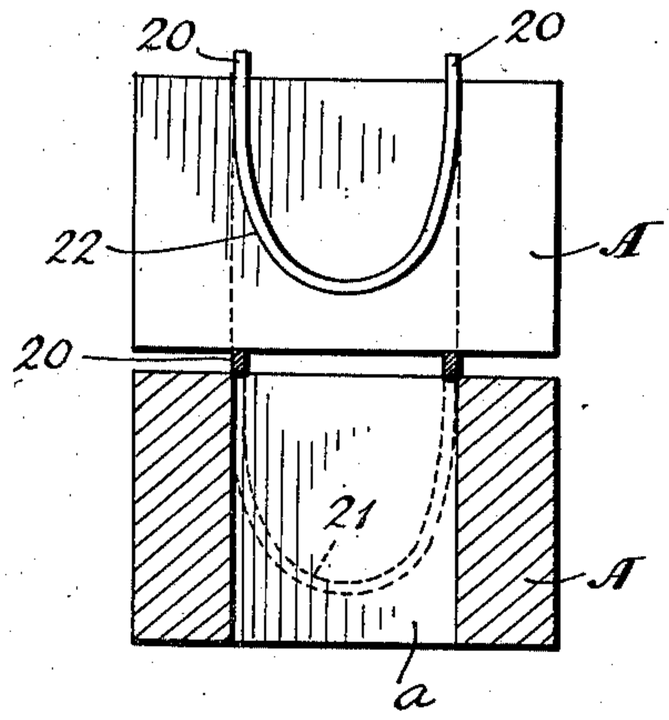
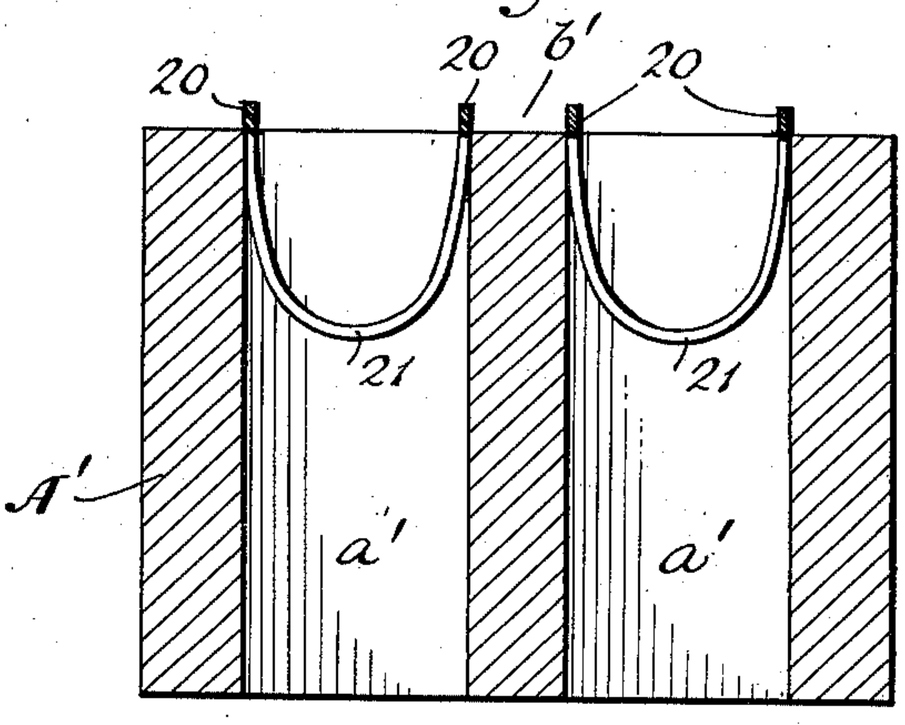


Fig. 4.



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July 12, 1938. V. A. BARNHART 2,123,225

BUILDING DEVICE

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Fig. 6.

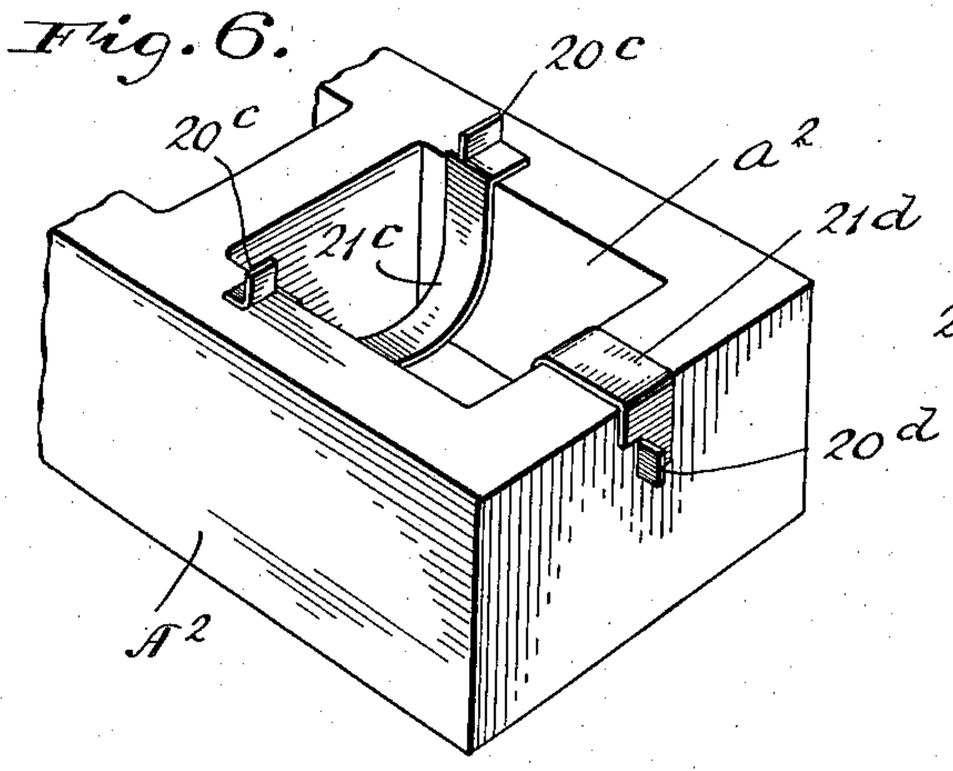


Fig. 14.

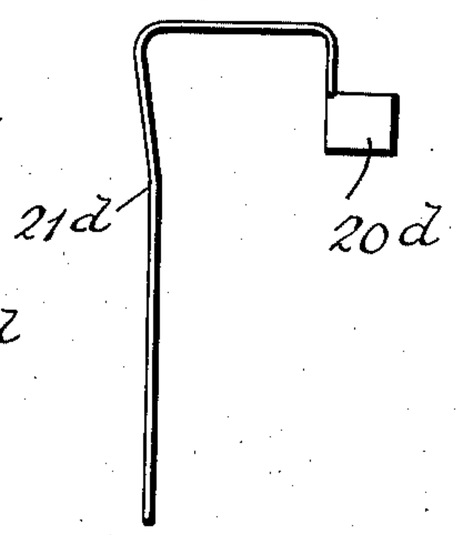
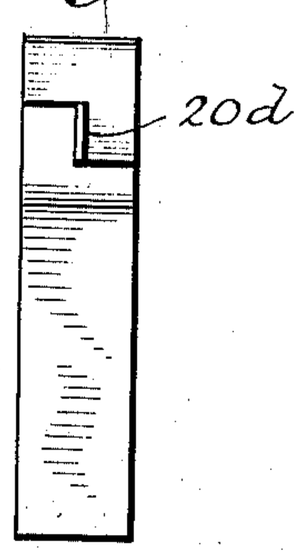


Fig. 15.



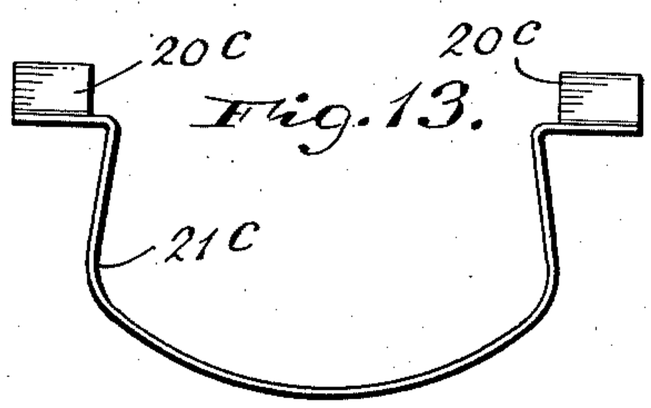


Fig. 13.

Fig. 7.

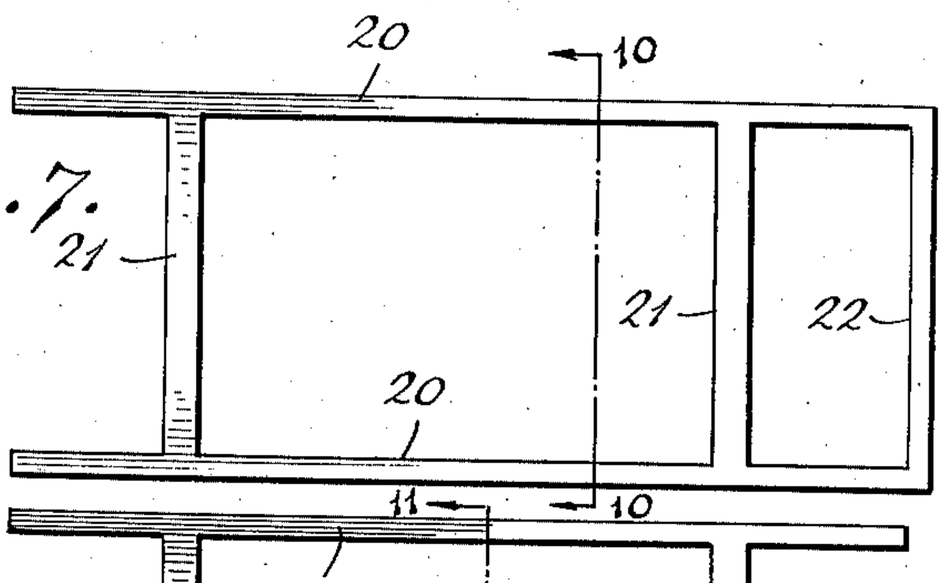


Fig. 8.

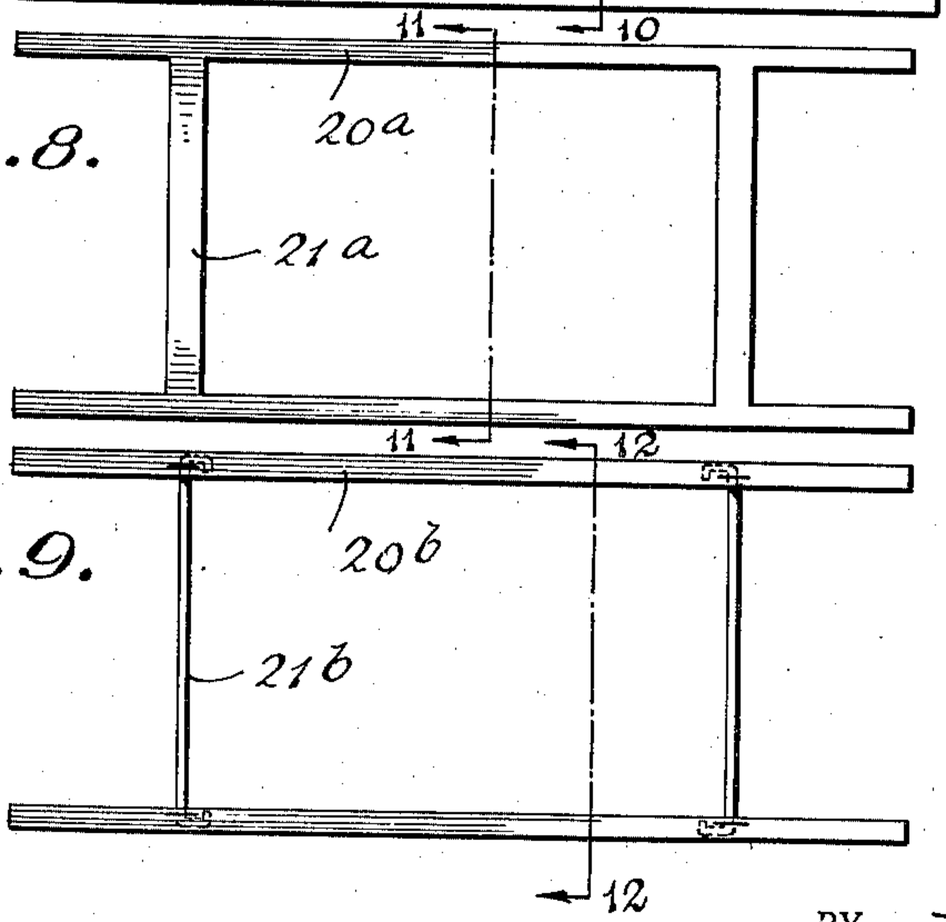


Fig. 9.

Fig. 10.

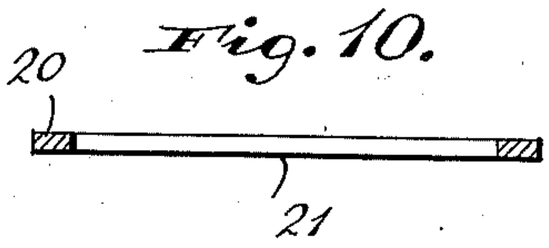


Fig. 11.

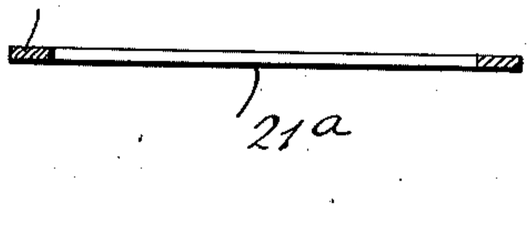
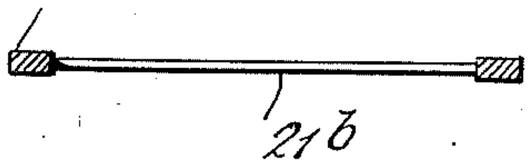


Fig. 12.



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Patented July 12, 1938 2,123,225

UNITED STATES PATENT OFFICE

2,123,225

BUILDING DEVICE

Vern A. Barnhart, Jester Lake, Milton, N. J.

Application February 17, 1937, Serial No. 126,118

9 Claims. (Cl. 72—128)

My invention relates to the art of building and more particularly to masonry structures as exemplified by walls and the like and has for its object to provide a novel building device which will facilitate the use of hollow units in the construction and erection of such masonry structures. The invention contemplates further the provision of a novel building device whereby impervious units and especially hollow units impervious to moisture may be efficiently and economically utilized in the erection of masonry structures with particular reference to finished walls. 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 drawings, which illustrate examples of the invention without defining its limits, Fig. 1 is a perspective view of a hollow building unit with one form of the novel device combined therewith; Fig. 2 is a sectional elevation of a masonry structure constructed of hollow units with the novel device embodied therein; Fig. 3 is a detail sectional view on the line 3—3 of Fig. 2; Fig. 4 is a cross-section of another form of hollow unit with the novel device combined therewith; Fig. 5 is a fragmentary perspective view of a hollow unit and the novel device; Fig. 6 is a fragmentary perspective view of a hollow unit with two other forms of the novel device combined therewith; Figs. 7, 8 and 9 are face views of three different forms of the novel device in their normal condition; Figs. 10, 11 and 12 are sectional views taken respectively on the lines 10—10 of Fig. 7, 11—11 of Fig. 8, and 12—12 of Fig. 9; Fig. 13 is a front elevation of one of the novel devices shown in Fig. 6, and Figs. 14 and 15 are views looking at right angles to each other of the other form of the novel device illustrated in Fig. 6.

Hollow building units of the type commonly referred to as hollow tile are extensively used in the erection of masonry structures, as exemplified by walls and the like. In many instances these hollow units are end set in courses so that the cells or chambers of the units in one course communicate with those of the units in adjacent courses to provide continuous channels and dead air spaces in the particular masonry structure. Because of the relatively narrow surfaces of end set hollow units, considerable skill and time is required on the part of the mason to properly place the mortar upon such narrow surfaces in order to provide suitable mortar beds and to avoid excessive loss of mortar. As a result, highly skilled operatives are required to properly and efficiently utilize such hollow units or tile in the erection of masonry structures, and even such operatives encounter difficulties in doing so.

In the building art it has become the practice to construct such hollow units or tile of a material which becomes very hard and impervious to water and which provides such hollow units with finished faces. This enables such impervious units to be utilized in the erection of finished walls and the like and in such case avoids the necessity for any additional treatment to provide a desired finish to the exposed faces of such walls and the like. Because of the fact that such impervious units are deficient in absorption properties, it is the general practice to use comparatively stiff mortar in laying the same. As is well known, stiff mortar does not work easily and even with mortar as stiff as it is possible to conveniently use the same, the bricklayer, after laying a predetermined number of courses of such hollow units, is forced to wait for the mortar in the erected section to set before he can build beyond this point or in other words before he can lay additional courses.

As the novel building device is specially designed to overcome the difficulties set forth above, said device has been illustrated and will be described in association with hollow units or tile, it being understood, however, that this is not intended to arbitrarily define the limits of the invention.

In all of its forms the novel building device comprises spacing means arranged to project perpendicularly from a surface of a building unit to predetermine the spacing of two adjacent units; in some forms the spacing means performs additional functions as will appear more fully hereinafter. In the preferred construction, the spacing means consists of two parallel strips 20 made of a material which is absorbent such as, for instance, cardboard or the like having an inherent rigidity in its operative position sufficient to perform the spacing functions and in some instances to support adjacent building units in the predetermined spaced relation. The device further includes transverse members extending between and connecting the strips 20 for instance at intermediate points to form a unit and to act as means for fixing said strips 20 in operative position as will be more clearly set forth hereinafter. The aforesaid transverse connecting members may be made of absorbent material and in such case may constitute integral parts of the parallel strips 20 as illustrated at 21 in Fig. 7, although if desired and preferred, these transverse members 21

may be otherwise connected with the strips **20** in any suitable manner. In another form of the device the strips may be made of suitable metal as indicated at **20**[a] in Fig. 8 and the transverse connecting members correspondingly constructed of metal as shown at **21**[a]. These transverse members **21**[a] may also comprise integral parts of the strips **20**[a] or be otherwise connected therewith. In still another form as shown in Fig. 9 the strips **20**[b] may be constructed of absorbent material, while the transverse connecting members **21**[b] may consist of metallic wires connected with said strips **20**[b] in any convenient manner. In the three forms of the device illustrated in Figs. 7, 8 and 9 respectively, the transverse connecting members **21**, **21**[a] and **21**[b] are normally straight and are capable of being flexed, for instance as shown in Figs. 1, 3 and 4, for insertion into a hollow building unit to fix said strips **20**, **20**[a] or **20**[b] in operative position thereon; the length of the connecting members **21**, **21**[a] and **21**[b] accordingly is greater than the distance transversely between the strips **20**, **20**[a] or **20**[b] of a given device when the latter is in place upon the building units. Preferably the device further includes an additional normally straight connecting member **22** extending between and connecting the strips **20** at one end thereof. This additional transverse member **22** is capable of being flexed with the other members **21** and in its flexed condition is arranged to project over and in engagement with an end face of the unit to constitute spacing means adapted to project perpendicularly from such end face in a horizontal direction for predetermining the spacing of two adjacent building units in the same course. The transverse connecting member **22** may, as shown in Fig. 7, comprise an integral part of the strips **20** or be otherwise connected therewith as may be preferred, it being understood that an additional member corresponding to the member **22** may also be included in the forms of the device shown in Figs. 8 and 9 respectively.

In order to simplify the description of the method of using the device in practice, the form thereof illustrated in Fig. 7 has been selected, it being understood that the other illustrated forms of said device are combined with the hollow building units in substantially the same way. In the erection of a wall or its equivalent the hollow building units A are laid in courses in the customary manner and the device is combined therewith in sufficient numbers in any suitable manner; for instance at a convenient time subsequent to the laying of one or more units A in a given course the mason or an assistant will place the device in operative position by flexing the transverse members **21** to an extent sufficient to enable said members **21** to be easily inserted into the cells or chambers of the hollow units A. The aforesaid flexing of the transverse members **21** may be readily accomplished by simply pressing the strips **20** of a given device toward each other, it being understood that the insertion of the flexed members **21** into the units A is continued until the strips **20** rest upon the upper faces thereof as illustrated in Fig. 1. The force such as the pressure of a human hand whereby the aforesaid flexing of the connecting members **21** may be effected is then removed whereupon the inherent flexibility of said members **21** will spread the same into engagement with the inner faces of the cells or chambers *a* of the unit A to frictionally hold the device in place and to position the strips **20** lengthwise of the unit A along the upper edges of said cells or chambers *a*. As shown in Figs. 1, 3 and 4, the strips **20** at this stage project upwardly in perpendicular relation to the upper surface of the unit A with the outer surfaces of the strips **20** in registry with and forming upward continuations or opposed faces of the cells or chambers *a* of the unit A. If the transverse member **22** forms a part of the device, the latter is placed on the unit A with which it is combined, in such a manner that said transverse member **22**, also in a flexed condition, extends downwardly over and in engagement with an end face of the unit A so as to project perpendicularly to said end face in a horizontal direction as shown in Fig. 1. The next unit A in the same course is then brought into engagement with the transverse member **22** to space the same from the previously laid unit A after which another of the novel device is correspondingly combined with said next unit A. These operations are continued until a complete course of the units A has been laid by the mason.

It will be noted when the devices are in position upon the units A that the strips **20** constitute inner stops extending lengthwise of the longitudinal relatively narrow upper faces *b* which form the mortar beds for these particular types of hollow building units. The mason may then place the mortar upon these narrow faces *b*, the strips **20** serving to prevent such mortar from falling into the cells *a* of the units A. The next course of units A is then superimposed upon the previously laid course so as to rest upon the strips **20**, the weight of said units A in the second course and the manipulation thereof by the mason, serving to squeeze the mortar on the beds *b* toward the front of the units A; this is due to the fact that the strips **20** act as stops and prevent the mortar from being squeezed into the cells *a*. The strips **20** thus serve to support and space the units A of the second course and enable the mason to use mortar of the most efficient consistency and to proceed with the erection of the wall or other masonry structure without any delay to first permit the mortar to set before subsequent courses are superimposed on each other. As the units A are built in courses upon each other, the pressure of the mortar against the strips **20** may cause the same to yield slightly and to permit the mortar to overlap the unit A to a slight degree into the cells or chambers *a* so as to become keyed to said units as illustrated diagrammatically in Fig. 5.

If the strips **20** are made of absorbent material, they will in addition to their other functions serve to absorb sufficient moisture from the mortar to give the same an almost instantaneous set which permits the building of the wall or its equivalent to proceed without interruption. After the excess moisture has thus been removed from the mortar, it is retained for a time by the strips **20** in contact with the mortar as the latter sets; this is a very desirable feature as the moisture thus held in contact with the mortar during the setting process tends to harden it like concrete or in other words effects a bond of maximum efficiency between the adjacent building units A. The strips **20** when constructed of absorbent material may, for instance, be made of cardboard or other suitable substance rigid enough to support the building units and having inherent properties of absorption suitable to take up the excess moisture in the mortar to the desired degree and to thereby increase the speed of setting thereof to any predetermined extent. The novel device is thus specially adapted for use in

combination with impervious building units which, because of their lack of absorption, can under existing conditions be laid and used only with great difficulty and with the speed of laying reduced to a low point. Such impervious building units are particularly desirable for the erection of walls which are to include finished exposed faces. In existing practice it has been attempted to overcome the difficulties inherent in the use of impervious units by providing the same with an impervious face combined with a backing of absorbent material. When such units are utilized with ordinary mortar, the exposed impervious faces thereof often become stained which makes it necessary to use comparatively stiff mortar in connection with such units. This is objectionable because of the fact that the stiff mortar does not work easily so that its use is time consuming and even with the mortar reduced to the minimum possible stiffness, the mason is oftimes forced to wait for such mortar to set before additional courses of units A can be laid upon previously erected courses. In other words, in such cases the erection of the wall or other masonry structure is materially delayed, which objection is entirely avoided when the novel device is used.

It is well known in the building art that weathered joints on exterior work can be had only by tooling the joints which can be done correctly only when the mortar is stiff but not set. If the mortar is too soft, it smears and soils the wall or its equivalent which objection coupled with the difficulties of providing for the seating of the mortar often prevents the use of the desirable impervious hollow units for exterior use. With the instant novel device, particularly when the strips **20** are made of absorbent material, these objections are overcome and the creation of the aforesaid weathered joints becomes a very simple matter.

When used in connection with building units such as partition tile having a high degree of absorption, the novel device may be constructed of metal, for instance, as shown in Fig. 8, and in such case may be sufficiently rigid to support tile weights to a considerable height to thereby enable the mortar to be placed in the joints after the building units have been placed in position in a plurality of superimposed courses. The novel device may also be utilized, for instance, to regulate the joint at the top of a wall where the latter joins a ceiling and where the mason under ordinary existing conditions ofttimes experiences great difficulty in completing the wall. This difficulty results because of the fact that the mason as he attempts to lay the top-most course of building units in the narrow space between the top of the wall and the ceiling is forced to insert the units A transversely into such space; this invariably causes the previously laid mortar to be pushed from the bed and thereby produces defective results. With the novel device the building units may be set in place and the mortar subsequently introduced into the joints, the strips **20** in such case acting as stops to prevent the mortar from being unintentionally pushed from the beds; or in some cases the units A may be first set in place upon the novel devices so as to be supported thereby and the mortar inserted into the resulting joints subsequently.

When used in connection, for instance, with eight inch building units A′ which include transversely adjacent cells or chambers *a′*, the devices are applied to said units A′ as illustrated in Fig. 4 so as to produce a channel *b′* along the longitudinal central bearing walls of such units A′. This channel *b′* serves to accommodate the mortar along such central walls, the mortar being efficiently confined thereon by the strips **20** as will be clear from the illustration in Fig. 4. In existing constructions embodying building units A′, an architect or building department inspector or other official is unable to ascertain definitely whether mortar remains on such central wall after the masonry structure is completed and is at no time certain that the mason has been successful in maintaining the motar at such central point. This objection has been recognized to such an extent that recent specifications have increased the transverse dimensions of the outer walls of such building units A′ to provide wider mortar beds and have entirely eliminated the central walls thereof. The novel device when used as illustrated in Fig. 4 entirely eliminates these difficulties and insures adequate central mortar beds when building units such as A′ are utilized in the erection of walls or other masonry structure.

In some instances it may be desired simply to provide for the proper spacing of building units in the same course and also in superimposed courses. In such cases the novel devices shown in Figs. 6, 13, 14 and 15 may be utilized.

In the form shown in Fig. 13, the device comprises spacing means arranged to project perpendicularly from the upper face of a hollow building unit A^2 and consisting of upright projections **20**^{c} spaced apart and connected by means of transverse members **21**^{c}. In practice the connecting members **21**^{c}, which preferably are normally flexed as shown, project into the interior of the building unit A^2, that is, into the cell or chamber a^2 thereof and serve to position the upright projections **20**^{c} in perpendicular relation to the upper surface of said building unit A^2 at opposite sides of the cell or chamber a^2 as illustrated in Fig. 6. To provide for the predetermined spacing of two adjacent building units in the same course, the device may be in the form shown in Figs. 14 and 15 and include projections **20**^{d} adapted to extend in perpendicular horizontal relation from an end face of the building unit A^2 as shown in Fig. 6. The projection **20**^{d} is carried by a connecting member or clamp **21**^{d} arranged and dimensioned to extend into the cell or chamber a^2 and to be clamped upon an end wall of the building unit A^2 as illustrated in Fig. 6. With the devices of Figs. 13, 14 and 15 in position upon the building unit A^2, it will be obvious that the projections **20**^{d} serve as spacing means for spacing two adjacent units in the same course to a predetermined degree while the projections **20**^{c} will correspondingly serve as spacing means to predetermine the spacing of two adjacent units in superimposed courses. In other words, in the latter instance the units A^2 of one course rest upon and are supported by the projections **20**^{c} of the devices combined with the units A^2 of the next lowest course.

When constructed as shown in Figs. 1 to 5 inclusive and 7 to 12 inclusive, the device prevents mortar from falling into the interior of the building units and thus saves mortar and at the same time avoids the necessity for replacing any such lost mortar by the mason. The novel device also enables the mason to work at high speed and to point or tool the wall or other masonry structure at once instead of being required to wait for long intervals before this can be done as is at present

the case. The novel device also obviates long waits for the mortar to set as is necessary under present conditions and accordingly enables the wall or other masonry structure to be built to the desired height without interruption of the erection process. The device also avoids the necessity for highly skilled masons which skilled labor is now required in the use of hollow building units for erecting walls and other masonry structure. In other words, the novel device particularly when the strips **20** are made of absorbent material, will add considerably to the utility of end set hollow building units and will not require highly skilled workmen in their use.

When the device is in operative position on the building unit, the strips **20** or their equivalent do not reduce the normal width of the mortar beds *b* so that said strips **20** may be made, for instance, of cardboard or heavy composition stock of any transverse thickness desired to provide a greater or lesser degree of absorption as may be preferred.

The combination of the novel devices with the building units requires no particular skill and may be accomplished at a minimum cost by an unskilled assistant after the mason has placed the building units in position in the wall or other masonry structure. By making the transverse connecting members **21**, **21**[a] and **21**[b] of predetermined dimensions as to length, the device will efficiently fit building units having different and varying internal dimensions. By constructing the devices in the normal flat condition illustrated in Figs. 7, 8 and 9, the devices may be economically constructed and may be readily stored and shipped in large quantities in restricted spaces.

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 device of the kind described comprising strips of material located in spaced parallel relation and arranged to extend in upright relation lengthwise of a hollow building unit, transverse members connecting said strips at intermediate points and arranged to extend interiorly of said hollow unit for fixing said strips in operative position on the upper face of said unit, and an additional transverse member connecting said strips at one end and arranged to project downwardly over and in external engagement with an end face of said unit.

2. A building device of the kind described comprising spaced, parallel strips of absorbent material, and normally straight transverse members connecting said strips and capable of being flexed for insertion into a hollow building unit to fix said strips in operative position thereon.

3. A building device of the kind described comprising spaced, parallel strips of absorbent material, and normally straight transverse members of absorbent material connecting said strips and capable of being flexed for insertion into a hollow building unit to fix said strips in operative position thereon.

4. A building device of the kind described comprising spaced, parallel strips, normally straight transverse members connecting said strips and capable of being flexed for insertion into a hollow building unit to fix said strips in operative position thereon, and a normally straight transverse member extending between said strips at an end thereof and capable of being flexed with said other members for projection over and engagement with an end face of said unit.

5. A building device of the kind described comprising spaced, parallel strips of absorbent material, and normally straight metallic members connecting said strips and capable of being flexed for insertion into a hollow building unit to fix said strips in operative position thereon.

6. A building device of the kind described comprising spaced, parallel strips of absorbent material, and normally straight wires connecting said strips and capable of being flexed for insertion into a hollow building unit to fix said strips in operative position thereon.

7. The combination of a hollow building unit having an internal chamber, flexible means projecting into said chamber and engaging a surface thereof, and means connected with said flexible means and positioned thereby in upright position upon an exterior face of said building unit.

8. The combination of a hollow building unit having a hollow interior, flexible members extending into said building unit and engaging opposite faces of said hollow interior, and strips connected with said flexible members and positioned thereby in engagement with the upper face of said unit in perpendicular relation thereto to provide stops along the longitudinal inner edges of the mortar beds thereof.

9. The combination of a hollow building unit having a hollow interior, flexible members extending into said building unit and engaging opposite faces of said hollow interior, strips connected with said flexible members and positioned thereby in upright engagement with the upper face of said unit to provide stops along the longitudinal inner edges of the mortar beds thereof, and an additional flexible member connecting said strips at an end thereof and projecting over and in engagement with an end face of said unit in horizontal perpendicular relation thereto.

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