Jan. 7, 1964 D. TORRICELLI 3,116,570

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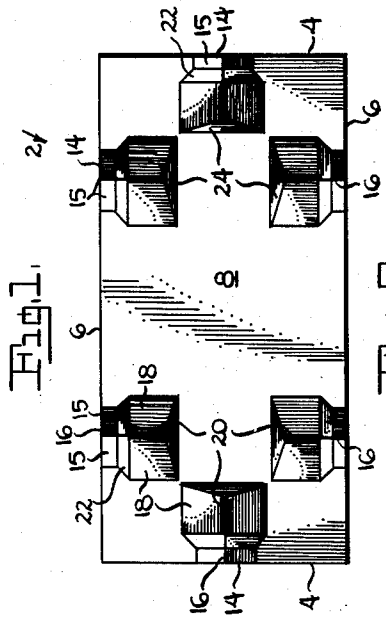


Fig. 1.

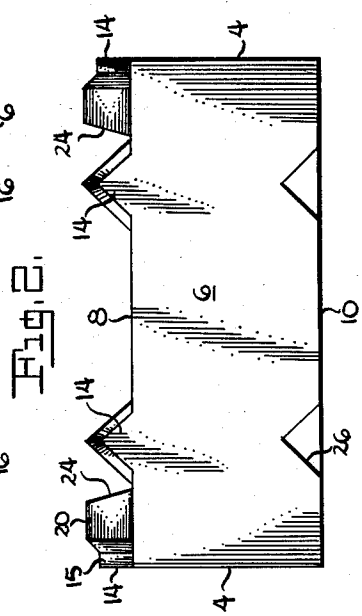


Fig. 2.

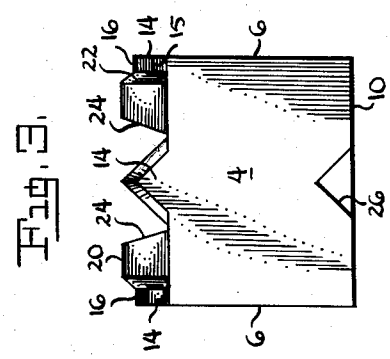


Fig. 3.

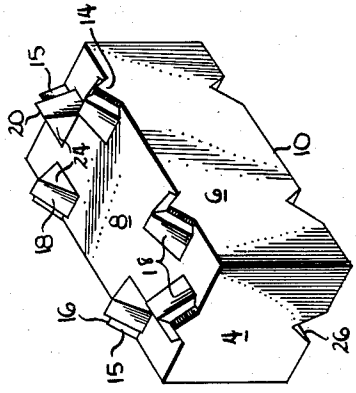


Fig. 4.

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INVENTOR.
DECIO TORRICELLI
BY Kenwood Ross
ATTORNEY

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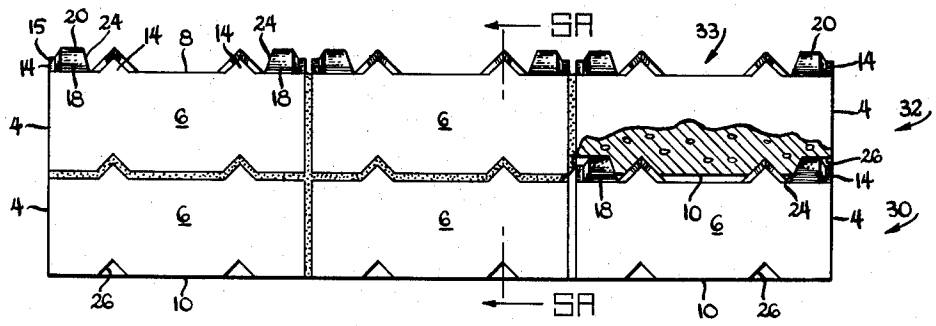


Fig. 5

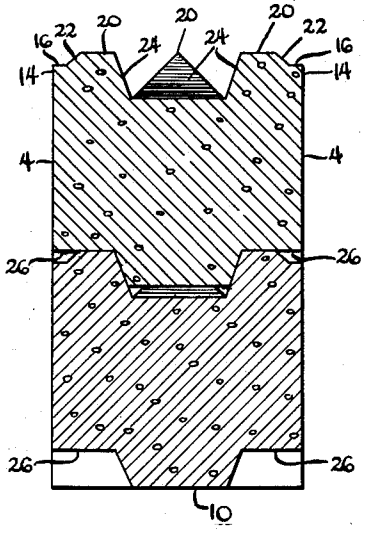


Fig. 5A

INVENTOR.
DECIO TORRICELLI
BY Kenwood Ross
ATTORNEY

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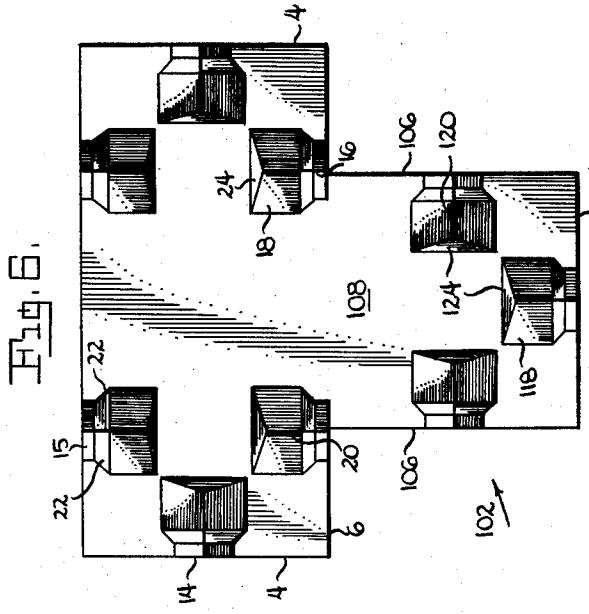


Fig. 6.

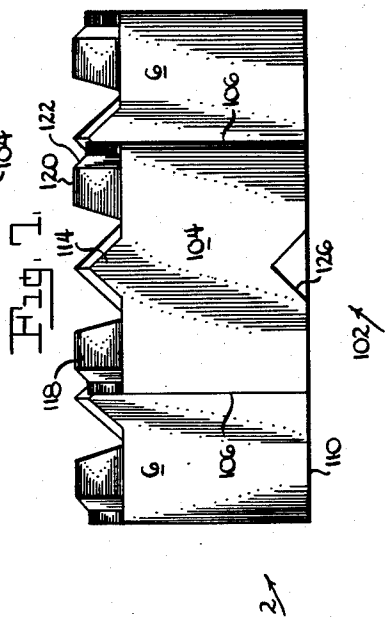


Fig. 7.

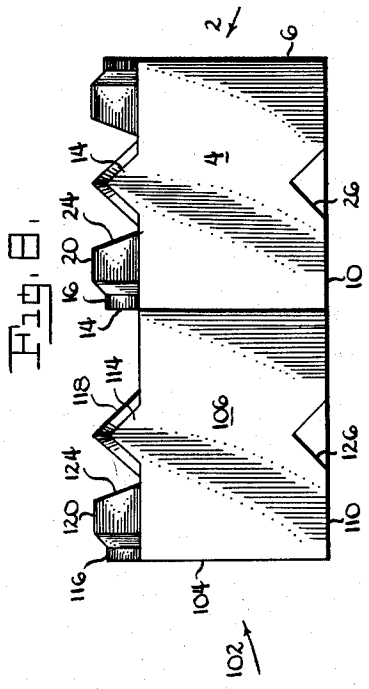


Fig. 8.

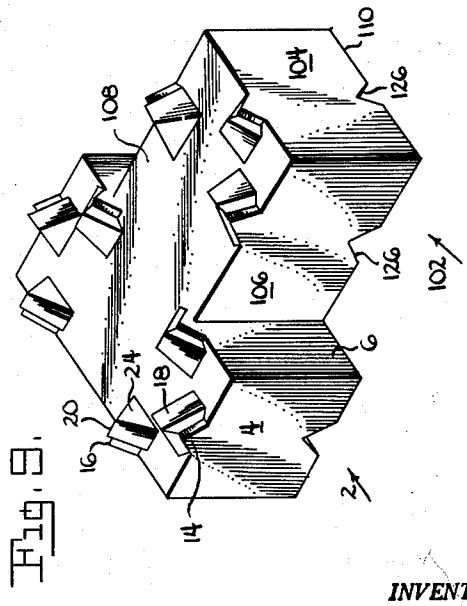


Fig. 9.

INVENTOR.
DECIO TORRICELLI
BY Kenwood Ross
ATTORNEY

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Fig. 10.

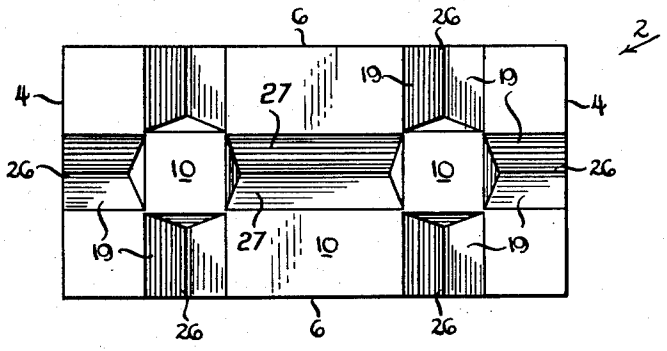
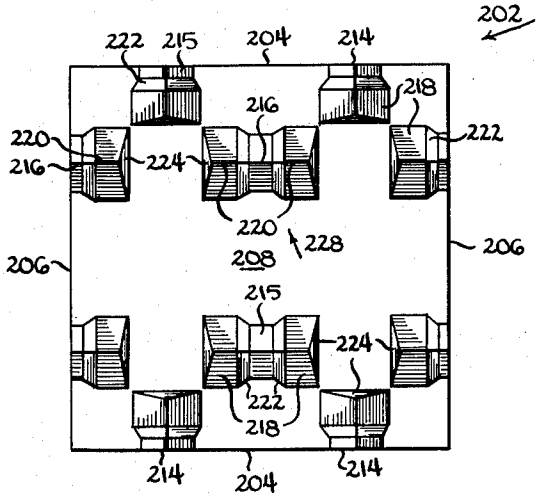


Fig. 11.



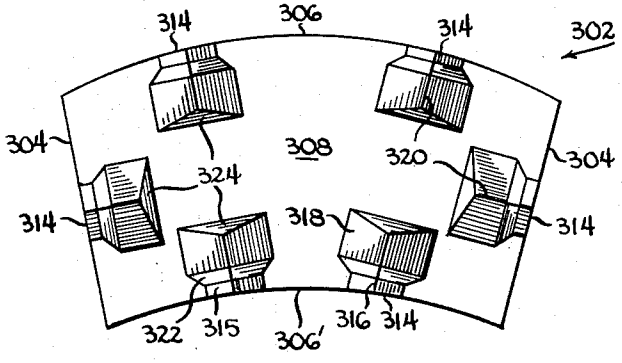


Fig. 12.

INVENTOR.
DECIO TORRICELLI
BY Kenwood Ross
ATTORNEY

United States Patent Office 3,116,570 Patented Jan. 7, 1964

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BRICK

Decio Torricelli, 11 Bowles Park, Springfield, Mass.

Filed Nov. 5, 1959, Ser. No. 851,137
1 Claim. (Cl. 50—273)

This invention relates to new and useful improvements in refinements in structural building units and, more particularly, to such units in the forms of bricks or building blocks or the like, and to a wall or building construction employing such units.

One of the primary objects of the present invention is to provide a brick or block which, when laid in the conventional manner, will insure accurate lateral and longitudinal alignment as to other contiguous bricks and as to the surrounding construction or terrain and will obviate difficulties heretofore experienced in the spreading of mortar or grout in connection therewith.

A further object hereof is to provide a brick having triads of inverted V-shaped upwardly-extending bosses or protuberances disposed in predetermined spaced and triangularly related position upon the top surface thereof and having corresponding inverted V-shaped sockets or notches or declivities disposed in complemental spaced relation upon the bottom surface thereof, all designed to insure an improved interlocking and holding action when a plurality of said bricks are superposed in contiguous relation in a wall or the like, it being a desideratum hereof to provide a brick which is self-spacing, self-interlocking, and self-aligning.

Still another object hereof is to provide a brick of the character described which is so constituted that it may be readily laid up in a wall or other structure, with or without the use of a suitable adhesive agent, such as cement or mortar, or laid up dry with the adhesive agent being introduced thereafter by manual or mechanical means.

It is another object hereof to provide a brick which may be readily laid up in a wall or other structure with or without the use of cement or mortar. That is, it is designed to produce an ornamental effect as well as to accomplish a self-interlocking action whether or not an adhesive agent is employed.

Another object of the present invention is to provide improved brick or tile which are self-tying or binding when laid in cement or mortar, which are not liable to settle or change their position after being laid, and which are provided with means for regularly and evenly spacing the same apart from each other horizontally and/or vertically in a wall or like construction.

A salient feature of the invention is the provision of a brick which may be put to a plurality of uses and which may be modified for use with facility in the erection of a partition or wall section.

Further objects of the invention are to provide a brick which is both practical and ornamental, the pleasing symmetry of its spaced projections making it most adaptable for use in finish work and most practical for use in the construction of mortarless walls, retaining walls, and the like.

Attempts have been made heretofore to provide a structure building unit in the form of a brick or the like having mechanical interlocking and self-spacing features. None have been entirely successful however.

No one has provided a unit which may be readily and economically produced and laid up in mortar or laid up dry and left in that condition or laid up dry with the mortar being introduced after the units have been so laid up and which is constructed so that the units are self-spacing, self-aligning and self-interlocking so that the units may be accurately and properly laid up with a minimum of time and effort by skilled or unskilled workmen.

With the foregoing and other objects in view, it will be apparent that the physical embodiments delineated are only indicative of but certain of the various ways, albeit the preferred exemplifications, in which the principles of the invention may be employed and in which the component parts may be combined and arranged. Same are submitted as best known embodiments of the invention in accordance with the patent statutes and are given with a view to illustrating and explaining the precise nature of the principles of the invention and their embodiments for practical use, in order that others skilled in the art may be enabled to adapt and modify them in other variations, each as may be best adapted to the conditions of any particular use.

These and other objects of my invention will become more apparent from the following detailed description of several embodiments thereof when read in conjunction with the drawings wherein:

FIG. 1 is a top plan view of one form of the brick of the invention;

FIG. 2 is a side elevational view of the brick shown in FIG. 1;

FIG. 3 is an elevational view showing one end wall of the brick of FIGS. 1 and 2;

FIG. 4 is a perspective view of the brick of FIG. 1 showing the top, side and end walls thereof;

FIG. 5 is a fragmentary front elevational view of a building wall, partly in section, composed of bricks of the form shown in FIGS. 1–4;

FIG. 5A is a sectional view taken on the line 5A and 5A of FIG. 5, with the mortar between the bricks having been omitted for purposes of clarity;

FIG. 6 is a plan view of the top surface of a modified T-shaped brick;

FIG. 7 is a side view in elevation of the brick shown in FIG. 6;

FIG. 8 is an end elevational view of the modified brick of FIGS. 6 and 7;

FIG. 9 is a perspective view of the modified brick of FIGS. 6–8;

FIG. 10 is a bottom plan view of the brick shown in FIG. 1;

FIG. 11 is a plan view of the top surface of a modified double brick; and

FIG. 12 is a top plan view of a modified curved brick.

With continued reference to the drawings, illustrating typical and preferred embodiments of the invention for purposes of disclosure, I have shown, in FIGS. 1–5A and 10, a building unit in the form of a brick, generally indicated by 2, which is preferably of standard or other suitable dimensions and may be formed from clay, cement, plastic, metal or equivalent material.

The brick 2 is comprised of a body portion having oppositely disposed flat end faces 4, oppositely disposed flat side faces 6, and top and bottom walls 8 and 10 respectively.

To provide the self-spacing, self-aligning, and self-interlocking features, an arrangement of upwardly-extending bosses is utilized on the top walls of the bricks and an arrangement of inwardly-extending depressions or notches is utilized on the bottom walls of the bricks, as will now be made clear.

The brick 2 is provided with suitable means for the spacing of same vertically above other brick upon which it may be laid and for the lateral spacing from other brick adjacent which it may be laid, wherefore mortar may be conveniently placed therebetween in known manner.

It will be observed that the brick is provided with a triad of integral, inverted, V-shaped bosses or protuberances at each end of the top wall thereof, the bosses of each of the triads being arranged in triangularly spaced

relationship as to each other. In total, six such bosses are provided on the top planar wall of the brick, each extending upwardly from the horizontal plane of said top wall and each being disposed adjacent a side or end wall of the brick in manner to be more fully described.

It will be noted that this disposition of the bosses adjacent the side and end walls of the brick provides an open area on the top wall intermediate the two triads so as to offer a flat planar surface from which mortar can be more easily removed, as by scooping or scraping, as will subsequently be observed.

In another sense, the bosses may be considered to be formed in pairs, each boss being disposed in longitudinal alinement with another boss adjacent the side or end wall of the brick opposite thereto.

The bosses are each of generally triangular shape in cross section. Each has an outermost vertically-extending face 14 which is generally triangular in shape and disposed in a plane in coincidence with the plane of the respective end or side wall to which the said boss is adjacent, all so as to provide a planar surface merging smoothly and uninterruptedly with said side or end wall.

Adjacent said outermost face 14, a pair of upwardly facing and inclining recess surfaces 15 converge toward each other to form therebetween a sharp recess ridge or apex 16 extending horizontally and inwardly from the apex of said outermost face 14 and in a direction perpendicular to the vertical plane thereof.

A pair of inclined upwardly-facing supporting surfaces 18 converge toward each other to form a sharp supporting ridge or apex 20 which extends inwardly, in a horizontal plane above the horizontal plane of the related recess ridge line 16, permitting the disposition of a bevelled connecting wall 22 between the outer side edge of each supporting surface 18 and its related recess surface 15. Stated otherwise, the supporting surfaces 18 face upwardly in converging relation, as to each other and each said supporting surface 18 is provided with a recess lengthwise of and adjacent the respective outermost vertically-disposed face 14 of the boss.

Supporting surfaces 18 serve the function of supporting a brick disposed immediately thereabove, as will appear.

It will be observed that the outer recessed portion of the boss provides a pocket when adjacent bricks are brought into interlocking relation and to preclude the chipping or breaking off of the edges of the supporting surfaces 18 in the brick-laying process.

Each supporting surface 18 is slightly wider at its base adjacent the planar wall 8 than at its peak at the ridge line 20 wherefore an innermost face 24 of the boss is provided which forms an inclined surface extending downwardly and rearwardly from the ridge line 20 to the wall 8 and merging with the inner side edge of each adjacent supporting surface 18 throughout its length.

The bottom wall 10 of the brick is recessed with appropriately spaced inverted V-shaped notches 26 complemental to the bosses of the top wall of said brick. Said notches have converging side walls 19 of a dimension and inclination to correspond to the spacing and sloping of the supporting surfaces 18 of the bosses. These notches 26 are disposed in manner to provide equally spaced sets of three, triangularly spaced openings, at each end of the brick. There is also provided an inverted V-shaped notch 27 which extends centrally of the bottom wall and longitudinally along a medial line through and in alignment with the V-shaped notch of each set of three adjacent each end of the brick.

The brick shown in FIGS. 1–4 and 10 may be employed in one of the two manners shown in FIGS. 5 and 5A.

A bottom or foundation row of bricks, as generally indicated by 30 in FIG. 5, is first laid in the conventional manner, mortar or cement or grout being disposed between adjacent bricks of the row in known manner.

A second row, generally indicated by 32, may next be laid thereabove with mortar or the like separating the courses in known manner. The brick hereof lends itself to the scraping away of old mortar along the midsection of the top planar wall of the brick intermediate the triads of bosses as indicated by numeral 33 in FIG. 5 where, as is often the case, it may be desired to remove old mortar as by scraping away before laying down fresh mortar preparatory to the laying of a brick adjacent an already laid brick in the next row 32. The flat planar wall 8 lends itself admirably to this so-called scraping or scooping function.

The inclined side walls 19 of a notch 26 of one brick are adapted to nest upon the complemental supporting surfaces 18 of a boss of another brick located thereunder in vertical alignment therewith in manner whereby with the depth of a notch being less than the height of a boss, the said one brick is spaced upwardly from the said other brick to provide a mortar receiving space therebetween with the recess, defined by the side walls 19 of the notch of the said one brick and the surfaces 15 of the boss of the said other brick, serving as a mortar receiving space communicating with said mortar receiving space.

It will be readily apparent that when successive layers of bricks are laid, the open ended notches 26 interfit with the bosses in such manner as to accurately align the opposite side walls of the bricks, and to align adjacent bricks with the same center line spacing so as to space the bricks equally as to each other longitudinally of each of the courses.

By the use of the sharp ridge lines, and when an adhesive agent is employed in laying the bricks, the sharp edged bosses aid in readily achieving a cutting through of the adhesive agent so as to aid in the accomplishment of the accurate spacing.

The use of the bosses also increases the adhesive area or surface of the brick. This will be apparent from the fact that the sloping surfaces of the bosses in combination with the planar wall 8 have a total area greater than the flat area of the top wall alone so that when an adhesive agent is used, the actual contact area is greater than if a flat surface brick were used.

As aforesaid, as shown in FIG. 5 a row of bricks, as generally indicated by 32, may be laid upon the row of bricks 30. These bricks may be laid with the joints in each row in vertical alignment as to each other as shown.

These bricks are laid with the correct spacing between the laterally adjacent bricks and between the vertically adjacent bricks by virtue of the bosses and complemental notches of the bricks. They are laid successively end to end and each in turn is pressed downwardly into the layer of mortar in such manner that the depressions cut their way through the mortar and enable the brick to be forced into direct and firm contact with the mortar on the adjacent bricks of the lower row.

Moreover, with a wall of such brick, the brick having a direct contact or bearing of row upon row precludes the possibility of any settling of the wall after the same has been laid before the drying or hardening of the cement or mortar.

Furthermore, the distance between the rows and between bricks of a row is exactly regulated by the bricks themselves wherefore less skilled labor is therefore required to lay them.

By reason of the constructions described, successive rows of bricks laid upon each other are separated by regular spaces or distances determined by the depth of the declivities and the height of the bosses of the bricks used.

The modifications shown in FIGS. 6–9 and 11 and 12 will now be described.

To avoid needless repetitions of description, similar characters of reference have been applied to the corresponding parts in the illustrations of the various forms of the invention and new reference characters applied only where significant departure takes place.

Illustrated in said FIGS. 6–9 is a T-shaped brick, so-called for the reason that it includes the brick 2 heretofore described and a so-called half-brick 102, being one-half of a brick 2.

The T-brick is comprised of the same body portion 2 having the oppositely disposed flat end faces 4, side faces 6, and the top and bottom faces 8 and 10 respectively and a half brick 102 having oppositely disposed flat end faces 104, flat side faces 106 and top and bottom faces 108 and 110 respectively.

The half-brick 102 is jointed to or formed integrally with the brick 2, as desired, and one end wall 104 thereof is centrally disposed relative to one side wall 6 of the brick 2, as shown.

In order to provide the aforedescribed self-spacing, self-aligning, and self-interlocking features, various arrangements of projecting portions are utilized on the top faces of the bricks and inwardly extending depressions are utilized on the bottom faces of the bricks.

The brick is provided with the same triad of integral inverted V-shaped bosses or protuberances which are arranged in triangularly spaced relationship as to each other at each end of the top face of the brick 2 and with a triad of protuberances at the outer end of the top surface of the half brick 102. In total, nine such bosses are provided on the top surface of the brick, extending upwardly from the horizontal plane thereof and adjacent a side or end of the unitary brick and half brick, as shown.

The forward or outermost vertically extending side face 114 of each boss on the half brick is generally triangular in shape and is disposed in a plane in coincidence with the plane of the respective end or side face to which the boss is adjacent so as to provide a smooth uninterrupted planar surface merging with said side or end face.

Adjacent the forward face 14 of each boss, the inclining recess surfaces converge toward each other to form a recess ridge line 116 which extends perpendicularly and inwardly from said forward face 114.

The inclined supporting surfaces 118 of the main body portion of the boss converge toward each other to form a sharp ridge line 120 which extends inwardly in a direction parallel to the longitudinal axis of the ridge line 116, same being disposed in a horizontal plane below the horizontal plane of the ridge line 120 to permit the disposition of a bevelled connecting wall 122 between the outer side edge of each supporting surface 118 and its related inclining surface.

The rear face 124 of the boss forms an inclined surface which extends downwardly and rearwardly from the ridge line 120.

The bottom surface 110 of the brick is recessed with appropriately spaced inverted V-shaped declivities 126 complemental to the bosses of the top surface as above described.

The T bricks are useful in the forming of retaining walls or in partitions when used in combination with the regular bricks 2, they being appropriately spaced so as to form a jointure between a main wall and a partition wall or to form a jointure between a main retaining wall and the angularly disposed sectional walls for use in connection with the retaining wall.

Illustrated in FIG. 11 is a double brick, so-called because it includes two of the bricks 2 heretofore described, joined at their side faces 6, to form one square, integral unit.

The double brick is comprised of a body portion 202 having oppositely disposed flat end faces 204, side faces 206, a top face 208, and a bottom face 210, not shown.

The brick is provided with integral inverted V-shaped bosses or protuberances which are arranged in spaced relationship as to each other at each side of the top face 208 of the brick 202. In addition, two of the inverted V-shaped bosses are joined at their front faces 214 so as

to form one integral unit generally designated as 128 and which is situated centrally of each end 204 of the brick but removed from said ends to a transverse line common with the line of the inverted V-shaped bosses adjacent the two sides 206. In total, there are 8 single unit bosses disposed on the top surface of the brick, each of which extends upwardly from the plane of the said top surface and each being disposed adjacent a side of the double brick. In addition, there are two double unit bosses 128 on the top surface of the brick, each double unit extending upwardly from the plane of the said top surface and each being removed inwardly from the ends 204 to a point on a line with the bosses adjacent the faces 206.

All bosses are generally triangular in cross section.

The forward or outermost vertically extending side face 214 of each of the single bosses is generally triangular in shape and is disposed in a plane in coincidence with the plane of the respective faces 204 and 206 to which the boss is adjacent so as to provide a smooth, uninterrupted planar surface merging with said faces 204 and 206. The single unit bosses are shaped as described in FIGS. 1–9, therefore their construction will not again be described.

The double unit bosses are formed by joining two of the snigle unit bosses at their respective front faces 214. Otherwise, these units are constructed in the same manner as are the single bosses.

The bottom surface of the double brick is recessed with appropriately spaced inverted V-shaped declivities, not shown, complemental to the bosses of the top surface. The declivities of the bottom surface are provided with converging side walls of the same size and sloped to correspond to the spacing and sloping of the side walls of the main body of the bosses.

The double bricks are useful in forming walls or partitions where extra strength or thickness is desired or required.

Illustrated in FIG. 12 is a curved brick 302, this brick being a modification of the brick 2 already described.

The brick 302 is comprised of a body portion having oppositely disposed end faces 304, curved convex side faces 306 and 306', a top face 308, and a bottom face 310, not shown.

The brick 302 is provided with the same triad of integral, inverted V-shaped bosses or protuberances which are arranged in triangularly spaced relationship as to each other at each end of the top face thereof as was shown in the brick 2.

The end faces 304 may be described as being on a plane perpendicular to a line drawn tangent to the arc formed by either the side face 306 or the side face 306'. In consequence, the arc formed by the forward face 306 is of greater length than the arc formed by the rearward face 306'.

The forward faces 314 of the inverted V-shaped bosses are generally triangular in shape and are disposed in a plane in coincidence with the plane of the respective end or side face to which the boss is adjacent so as to provide a smooth uninterrupted planar surface merging with said side or end face.

The inverted V-shaped bosses employed with the curved brick are identical in construction to those described in the brick 2. Therefore, a detailed description of this construction will not be repeated.

The bottom surface 310 of the brick (not shown), is recessed with appropriately spaced inverted V-shaped declivities complemental to the bosses of the top surface.

The curved brick may be used to great advantage in those situations requiring a curving wall. It is also useful in those instances where sharp corners would be avoided in favor of a gently curving edge.

I claim:

A brick having a solid interior and comprising, a pair of oppositely-spaced vertically-disposed side walls, a pair of oppositely-spaced vertically disposed end walls, a top

horizontally-disposed wall, triads of integral upwardly-extending triangularly-related protuberances projecting upwardly from said top wall adjacent its opposite ends, each protuberance of each said triad being of inverted V-shape and presenting a pair of angularly-disposed converging faces and the vertically-disposed outermost face in coincidence with the plane of a respective adjacent vertically-disposed wall of the side and end walls of said pairs thereof and an angularly-disposed inner face, the angularly-disposed converging faces of each pair thereof including a pair of supporting surfaces forming at their jointure an apex spaced from and extending horizontally inwardly in a direction perpendicular to the plane of the respective vertically-disposed outermost face and a pair of recessed surfaces extending horizontally inwardly from the respective vertically-disposed outermost face with each recessed surface being offset from and disposed in a parallel plane below the plane of the complemental supporting surface of the respective pair thereof and with the recessed surfaces of each pair forming at their jointure an apex extending outwardly from and in a horizontal plane below the horizontal plane of the respective apex of the pair of supporting surfaces and a bevelled connecting wall between the outer side edge of each supporting surface and the inner side edge of the respective recessed surface, the protuberances of said triads adjacent said end walls being longitudinally aligned as to each other along a longitudinal medial line through said top wall and the protuberances of each of said triad adjacent said side walls being longitudinally aligned as to each other along

a line disposed transversely to the longitudinal medial line, a bottom horizontally-disposed wall having triads of inwardly-extending triangularly-related notches adjacent its opposite ends, each notch of each triad being of inverted V-shape and presenting a pair of converging downwardly-facing seating surfaces and a vertically-disposed outermost opening disposed in coincidence with the plane of the respective adjacent vertically-disposed outermost wall and a centrally-disposed V-shaped notch extending longitudinally along a medial line through and in alignment with the notches of the triads adjacent said end walls, the depth of each of the notches of said bottom wall being less than the height of each of the protuberances of said top wall.

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