April 29, 1952 N. T. BALDANZA 2,594,378

HOLLOW INTERLOCKED BUILDING BLOCK AND WALL

Filed July 5, 1947

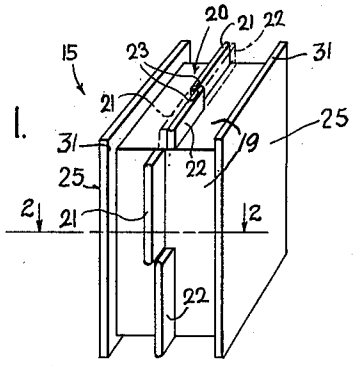


FIG. 1.

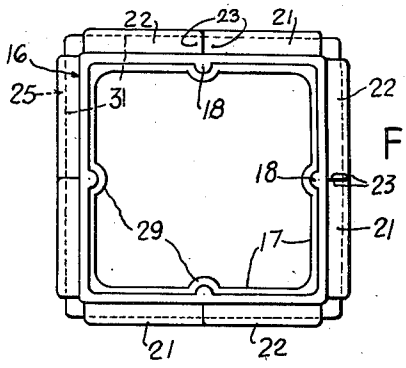


FIG. 3.

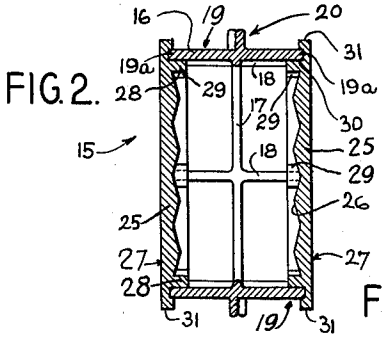


FIG. 2.

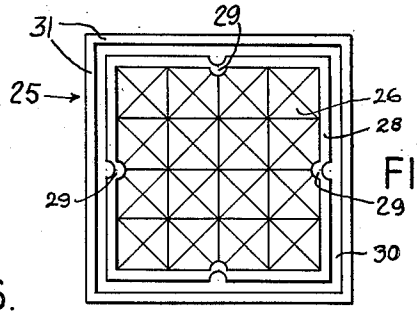


FIG. 4.

FIG. 6.

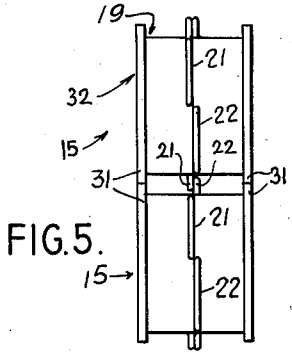
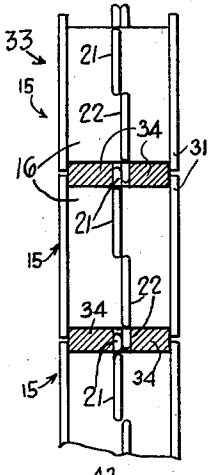


FIG. 5.



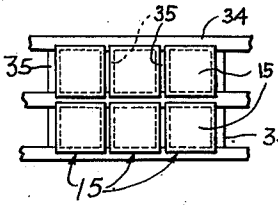


FIG. 7.

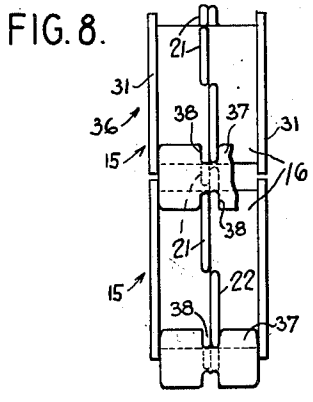


FIG. 8.

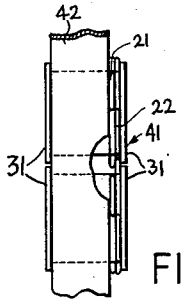


FIG. 11.

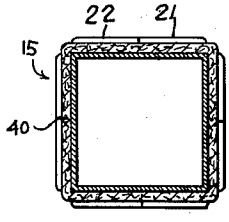


FIG. 9.

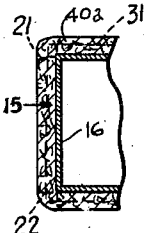


FIG. 10.

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HOLLOW INTERLOCKED BUILDING BLOCK AND WALL

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13 Claims. (Cl. 72—41)

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This invention relates to building blocks and to all structures composed thereof.

One object of the invention is the provision of building blocks having improved means adapted for directly interengaging the blocks against movement relative to each other.

Another object of the invention is to provide building blocks having integral means of improved character adapted to interlock adjoining blocks against relative longitudinal and transverse movement.

Another object of the invention is to furnish an improvement whereby a wall can be constructed of blocks having improved means concealed therebetween and adapted to universally interengage adjoining blocks along vertical and horizontal planes.

Another object of the invention is the provision of a wall structure having spacing means between the blocks coordinated with the integral interlocking means mentioned, and preferably supplementing the latter.

Another object of the invention is to provide an improvement in the art whereby blocks comprising attached face or panel sections are so interrelated, that the latter can be utilized as at least part of an interlocking means between the blocks.

Another object of the invention is to furnish an improvement in a wall structure which shall allow for expansion and contraction effects between the blocks thereof, while desirably also serving as an interengaging means for the latter.

Another object is to furnish a wall structure comprising blocks permitting a high degree of passage of light therethrough, and providing for an interplay between transparent and opaque sections to obtain striking light effects.

A particular object of the invention is to furnish a building block comprising a hollow body and panel portions or covers therefor adapted to be made of plastic material by molding in a particularly simple and inexpensive manner, and at the same time embodying features of construction adapted for interengaging blocks for the rapid installation of a wall structure in a manner so simple that skilled labor is not required.

Plastics have numerous advantages because they are lighter in weight, afford a selection of color, are shatter-proof, and are adapted to be molded with a high degree of accuracy. The different plastic parts of the block are adapted to be hermetically sealed together by a plastic cement or solvent. Thus the plastic block has substantial advantages as compared with a glass block, the latter being heavy and affording various inaccuracies in blowing or casting. If a block is formed of a styrene plastic, it is inexpensive, slow burning, and without yielding toxic fumes, and is a good dielectric. The plastic blocks may be mounted in a manner that will allow for expansion and contraction effects, with yielding or cushioning spaces if desired, which spaces may also have an interlocking function.

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Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention comprises the novel features, combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is an isometric perspective view showing a block embodying the invention and illustrating in dot-dash lines the interlocking relationship of portions of adjoining blocks.

Fig. 2 is a horizontal sectional view taken through the upper third of the block as seen along line 2—2 of Fig. 1.

Fig. 3 is an inside elevational view of the block, with a cover or panel removed, and prismatic faces of the other panel being omitted.

Fig. 4 is an inside view of the panel or cover.

Fig. 5 is a view in elevation or plan showing a pair of blocks interlocked with each other.

Fig. 6 is a view corresponding to that of Fig. 5 but showing interposed spacing or interlocking means, with parts in section.

Fig. 7 is a fragmentary view in elevation of a building wall according to the invention.

Fig. 8 is a plan view of a pair of interlocked blocks with modified spacers.

Fig. 9 is a sectional view of a modification comprising a modified spacer of ring form.

Fig. 10 is a fragmentary similar view of another modification.

Fig. 11 is a fragmentary view of still another modification.

The term "plastic" as used herein may include a great variety of materials in respect to the interlocking means and even as to transparency, but certain features of novelty involve the making of the block out of cellulose derivatives, particularly resinous materials, which may set by heating or by cooling, especially the latter, employed preferably in high pressure injection molding.

The advantages of the invention as here out-

lined are best realized when all of its features and instrumentalities are combined, but useful embodiments may be produced involving less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing a preferred exemplification of the invention.

Referring in detail to the drawing, 15 denotes a block embodying the invention, adapted to be used as a building or toy block and for other purposes. This block may consist of various materials or combinations thereof and is preferably formed of plastic. The block may be solid, but is preferably hollow, being constructed of one or more parts, by molding, blowing, or the like. The block may be of any desired size or shape, and is preferably square or rectangular.

The block 15 may comprise a main section 16 which is preferably hollow or tubular to conserve material and to permit the passage of light therethrough. This section or body 16 may be reenforced in any suitable manner as by a generally central continuous rib 17 and by transverse ribs 18 for the individual walls thereof. The body may have its outer edge portions 19*a* lying in parallel planes and being relatively thin, preferably uniformly with the rest of the body. An interlocking means 20 is formed on each side of the four side walls 19 of the body, preferably integral therewith. Each of the means 20 may comprise a first projection 21 and a second projection 22, the latter being transversely offset with respect to the first projection, and such offset need be no more than the thickness of the projection or rib. All of the first projections 21 on the different side walls of the body lie in a common plane, and all of the projections 22 on the different side walls of the body lie in a common plane, these planes being accordingly spaced from each other. The different projections 21 and 22 are arranged in uniform sequence around the body 16, with a projection of one plane following the projection in the other plane. Differently stated, the interlocking means comprise a sequence of pairs of offset symmetrically arranged projections, the generally parallel portions of which extend in the plane of or longitudinally of the body 16, with the projections of different blocks being thus adapted to interfit to prevent longitudinal and transverse movement between the blocks. Preferably the projections 21 and 22 are all substantially lengthy, each beginning where the other ends and being separated or interconnected at such ends. Desirably each projection is approximately one-half of the length of the block. The height of the projections may be uniform and it is intended to be sufficient to interlock with those of adjoining blocks even if spacers are employed between the blocks as hereinafter described. The manner of interlocking is further indicated by the dot-dash lines in Figure 1. It will be obvious that relative movement is prevented transversely of the blocks and also longitudinally thereof, as the projections shown in solid and in dot-dash lines have both lateral and endwise abutment with each other. The endwise abutment occurs between shoulder portions 23. In fact when a wall is built of the blocks 15, the interlocking is such that certain end blocks have to be angularly manipulated to work them into position. The projections 21 and 22 are preferably disposed centrally of the body 16, but as further indicated in Fig. 11, they may also be placed adjacent to a side of the body. It will be appreciated that the body 16 is adapted to constitute an advantageous building block irrespective of the cover portions hereinafter described. The body 16 is especially advantageous for simple and rapid molding, with the parting line of the mold being along the projections 21, 22.

Cooperating with the body 16 are the covers, panels, or wall elements 25, the latter having any desired ornamental characteristics and being opaque, translucent or transparent. Preferably these wall elements are translucent, with the interior surfaces thereof characterized by prismatic or other light diffusion portions 26, and the outer surfaces 27 being desirably smooth and uniform. On the other hand, the body 16, which may be translucent, is preferably opaque, and may have a solid white color, or mottled effect affording a novel and distinctive interplay with the light diffusing wall elements 25. The wall elements 25 are identical in construction, each having a continuous inwardly extending flange 28 adapted to snugly fit in the body 16 and having recessed portions 29 to snugly receive the ribs 18. At the outer faces of the flanges 28, the wall element may have a continuous groove 30 for receiving edge portions 19*a* of the body 16. The members 16 and 25 may be frictionally or permanently interconnected, as by adhesive, desirably of a plastic nature, or by the use of a solvent adapted to form an autogenous bond. Thus the block 15 may form a hermetically sealed chamber filled with air or other gas. Desirably the sealing is effected in a perfectly dry atmosphere to preclude any moisture contained in the air of the block, thus preventing condensation effects in cool weather. Each wall element 25 may be fairly thick and rugged, and the same applies to the flanges 28 so that the elements constitute load sustaining portions which greatly reenforce the body 16. The latter may be quite thin, and may act principally as a connector between the wall elements 25. The wall elements furnish continuous marginal lips or ribs 31 projecting beyond the outer faces of the body 16, but to a substantial lesser extent than the projections 21, 22.

It will now be seen that the block 15 consists of only three parts, namely, a tubular body and two identical covers and that all these parts are adapted to be easily molded and readily interconnected, to furnish a block which can be used in constructing an outside or inside wall of a building. The advantages of the invention are especially available for constructing removable partitions in buildings, and various other articles such as lunch counters and the like may be built therefrom. In Fig. 5 is shown a wall structure 32 embodying the invention and comprising a pair of blocks 15 disposed so as to rest upon each other at the lips or ribs 31, while being thus maintained interlocked by the projections 21, 22 hereinbefore described. The wall structure may be formed with horizontal and vertical rows of the blocks positioned and interengaged in the identical manner. Each block is adapted to be positioned in a universal manner, in any relation angularly and with either side thereof at one side of the wall.

In Fig. 6 is shown a building wall 33 embodying the invention and comprising a plurality of building blocks 15 arranged in the same general manner of the wall 32 except that long strip elements 34 have been interposed as spacers, thus producing a space between the adjacent lips 31, but the

blocks being close enough for interengagement between their projections 21 and 22. The strips 34 may be identical and may be of sufficient length to extend along a large number of the blocks in any desired direction, preferably horizontally. These strip elements may consist of wood or any other suitable material, and they may be regarded as a cushioning or expansion means. Each strip element is of such width as to seat snugly between lips 31 and projections 21, 22. In this manner the strips supplement the interlocking action of the projections 21, 22, and more especially they add rigidity to the wall as a whole. If desired short strip elements 35 may be used vertically between the blocks of each course as shown in Fig. 7, these strip elements being otherwise similar in function and arrangement with the strip elements 34.

In Fig. 8 is shown a modified wall structure comprising a plurality of blocks 15 interlocked as hereinbefore described, except that a different spacer 37 is used, consisting of any suitable material, such as wood, plastic, or the like, and having a pair of opposed notches 38 for accommodating portions of the projections 21 and 22. The spacer 37 functions in the same manner as the strips 34 except that it provides a single piece extending continuously across the blocks between the lips 31 thereof. This type of spacer is of particular advantage if the body 16 is transparent or translucent, in which case the spacer will not block the passage of light through the walls of the body 16.

In Fig. 9 is shown a modification including a block 15 having a different kind of spacer 40, the same consisting of a ring of fibrous, rubber, or other yielding or cushioning material which is positioned like the strips 34 between the projections and an adjacent lip 31, and is snugly fitted around the body 16 prior to the securement of the wall element 25, one or two of the elements 40 may be provided on each block.

In Fig. 10, the block 15 is shown as having a spacer ring 40*a* like that shown at 40, except that it may be of increased thickness so as to function in the manner of the elements 34 and in that event the next adjacent block would have to be free of such element in order to leave room therefor. The ring elements 40 and 40*a* have the advantage of providing a simple and tight joint between the blocks along all edges thereof to prevent the passage of sound, dust, and wind.

In Fig. 11 is shown a modification comprising a plurality of blocks 41, like those shown at 15 except that the projections 21, 22 are closely adjacent to one side of the blocks at the adjoining lips 31. Thus the interlocking action of the projections 21, 22 is obtained as hereinbefore described. Furthermore, a single strip element 42 may be used in place of the two strip elements 34 to function in the identical manner with the latter. This affords greater strength in the wall and may afford the advantage of different types of finish at opposite faces of the wall at the small spaces between adjacent spaced lips 31.

It will now be clear that the interlocking means involves the provision of three portions, namely, the longitudinal bearing sides of the two projections 21, 22 and the end or bearing shoulder portions 23 thereof which form in effect a transverse recess portion defined by shoulder surfaces acting in opposite directions to resist relative longitudinal movement of the blocks at right angles to the resistance offered by the longitudinal sides of the projections against relative transverse movement as is clear from Figs. 1 and 5. The several parts 21, 22, and 31 may be considered as locating or positioning lips, projections or shoulders at least for transverse gaging, fitting or interlocking. In a broad sense, all or some of the parts 21, 22, 23, 31, 34, 37, 40*a* and 42 may be considered as preformed means located substantially wholly between the blocks or at least between the body members 16 and interfitted to prevent relative movement in different directions between th blocks. Strips such as 37, Fig. 8, interfit directly between the lips 31 independently of the elements 21, 22, and afford an interlock if the latter are omitted, even though such interlock is less effective or useful. If the recesses 38 snugly fit the elements 21, 22, the plates 37 may serve as a reenforcing member between these elements; the plates may then be independent of or may cooperate with the lips 31, and may or may not form spacers. The main load strain on the blocks may be carried or transmitted at the cover walls 25. The term "cemented" is intended to also include autogeneous joining of the cover walls to the body 16, and there is formed a one-piece hermetically sealed structure whose expansion and contraction effects are quite uniform. The term "course" is used to indicate vertical or horizontal rows of the blocks. A wall constructed according to the invention transmits light sufficiently interrupted and diffused so that even the rough images of people will not appear therethrough, but with the light being conserved by the internal reflective surfaces of the body member.

The wall structure may be assembled in various ways, the length of the wall desired often being taken into consideration. For example, in assembling a wall structure five blocks in length the first horizontal row or tier may be readily assembled by placing five blocks side by side with projections 21 and 22 with adjoining blocks 15 interlocking as shown in Fig. 5, and a second interlocked row in a horizontal tier may be added as a unit above the first row to align and interengage therewith. To this end said second row of five blocks arranged in horizontal side by side interlocking relation is vertically aligned with the first row again with projections 21 and 22 on the top of each of the blocks 15 interlocked with those on the bottom of each of the blocks of the second tier. By repeating the steps of assembling rows of blocks 15 in tiers any desired height may be constructed without requiring intermediate binding means.

When a vertical wall structure having a large number of blocks in each tier is desired an alternative method of assembly may be used as, for example, the first tier may be assembled side by side with side projections 21 and 22 of adjoining blocks 15 interlocking but leaving about ⅛ of an inch between adjoining wall elements 25. The first end block 15 of the second tier, when starting from the left, may then be set so that its bottom or downward projections 21 and 22 interlock with the top or upward projections of the first block in the first tier. Adjoining blocks in the second tier may be set from left to right by tilting the last placed block ⅛ of an inch to the left and placing the upper corner of the left side projection 21 of the adjoining block 15 behind the upper corner of the right side projection 22 of said last placed tilted block of the second tier. Then by bringing the entire sides of both blocks together in interlocked position the two are fitted into assembly with

the blocks of the first tier. Each successive block in the second tier may be set in the same manner until the second tier is complete and the method continued for each successive tier until all the blocks are set. After the last block 15 is placed all blocks 15 may be pushed together so that adjoining wall elements 25 of blocks 15 abut each other to form an assembled interlocking panel wall structure with aligning exterior surfaces, as is clear from Fig. 5. It has been found that to facilitate assembly projections 21 and 22 may be offset from a geometric center line a distance of about .015 inch.

I claim:

1. A building wall having blocks formed with front and rear facing surfaces having on the different side walls thereof transversely offset, rib-like projections extending from the ends of each side wall and terminating at the center thereof, the projections of adjacent blocks thus interfitting and interengaging the blocks against relative movement in different directions, and spacer strips between blocks of different courses positioned wholly between said facing surfaces and having recesses interengaging with the projections at the ends of adjacent edge portions to provide a supplemental reinforcement.

2. A building block comprising a four sided rectangular intermediate tubular body having end closure walls forming front and rear faces of the block, interlocking means projecting from opposite sides of said body each including a pair of equal length ribs disposed in offset relation with respect to each other in opposite directions from a first plane extending therebetween, said pair of ribs being of equal height and each of a thickness less than one-half the width of the body side and being positioned in offset relation with respect to each other in opposite directions from a second plane passing through the center of the block perpendicular to the first mentioned plane for interfitting with similar ribs on adjoining blocks positioned in abutment therewith and with aligning closure walls of the blocks to form an exterior wall surface spaced from said ribs.

3. A building wall construction having a plurality of blocks each comprising a tubular open-ended intermediate body rectangular in cross-section, rectangular closure walls for the ends of each body connected thereto, said closure walls having an area larger than said body cross-section to form lips extending beyond the body positioned in edgewise abutment with the lips of adjacent blocks, each of said bodies having on opposite sides thereof between and spaced from the lips interfitting means preventing longitudinal and transverse movement between the blocks forming said wall construction, said interfitting means including a pair of longitudinal ribs offset with respect to each other transversely of the block, each rib bearing with a longitudinal side against a side of an offset rib on an adjacent block and with an end shoulder against an end shoulder of the longitudinal succeeding rib of said adjacent block.

4. The building wall construction as defined in claim 3 in which each of the sides of said body is provided with a pair of said longitudinally offset ribs of equal length each extending toward an opposite edge of its body side from a plane passing through the center of the block transverse the width thereof.

5. A building wall construction comprising a plurality of blocks each having a tubular open-ended body, closure walls covering said body ends and connected thereto, said closure walls having edge border extensions projecting beyond the body to form lips in edgewise abutment with the lips of adjacent blocks, and interfitting rib projections having surfaces lying in intersecting planes outstanding from each of said bodies spaced from one of said lips and extending beyond edges of the lips abutting surfaces of like rib projections on adjacent blocks for preventing longitudinal and transverse movement therebetween.

6. A building block comprising a tubular open-ended body, closure walls covering said body ends and connected thereto, said closure walls having edge border extensions projecting beyond the body to form lips for engaging in edgewise abutment with lips of similar adjacent blocks to form a wall structure, and interfitting rib projections having surfaces lying in intersecting planes outstanding from said body spaced from one of said lips and extending beyond edges of the lips to abut like rib projections of said similar adjacent blocs for preventing longitudinal and transverse movement therebetween.

7. A building block as defined in claim 2 in which said first plane passes through the center of the block and said pairs of ribs extend from all four sides of said body to form a symmetrical block.

8. A building wall construction having a plurality of blocks comprising a tubular open-ended intermediate body rectangular in cross-section, rectangular closure walls for the ends of each body connected thereto, said closure walls having an area larger than said body cross-section to form lips extending beyond the body positioned in edgewise abutment with lips of adjacent blocks, each of said bodies having on each side thereof between and spaced from the lips a pair of longitudinal ribs offset with respect to each other transversely of the block, the ribs forming a regularly arranged sequence around each block and interlocking with like ribs of adjoining blocks to prevent relative longitudinal and transverse movement therebetween.

9. A building wall construction as defined in claim 8 including a spacer ring member of cushioning material extending around each block interfitted between said ribs and lips of the block.

10. A building wall construction comprising a plurality of blocks arranged in vertical and horizontal courses, each block having a tubular open-ended body, closure walls covering said body ends and connected thereto, said closure walls having edge border extensions projecting beyond the body to form lips substantially in edgewise abutment with the lips of adjacent blocks, interfitting rib projections having surfaces lying in intersecting planes outstanding from each of said bodies spaced from one of said lips and extending beyond edges of the lips and abutting surfaces of like rib projections on adjacent blocks for preventing longitudinal and transverse movement therebetween, and spacer strip members extending between two horizontal courses of building blocks positioned between the lips of the blocks and said interfitting rib projections to supportingly engage the tubular bodies of the blocks of said horizontal courses and being of a thickness at least equal to the width of two of said adjacent lips for supporting the building wall weight on said tubular bodies.

11. A building wall construction as defined in claim 10, in which said rib projections are spaced from both of said lips and said spacer strip mem-

bers are positioned on both sides of said interfitting rib projections between the lips of the blocks.

12. A building wall construction as defined in claim 8 including a plate overlying adjacent blocks in a horizontal course at a joint area of the blocks, said ribs being elongated to the edges of said sides, the plate having end recesses accommodating the adjacent ribs and being interfitted between the lips of the blocks.

13. A building block as defined in claim 2 in which said first plane is positioned in closer parallel relation to one of said faces than to the other face.

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