United States Patent [19]

von der Ley

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[54] **BUILDING BLOCK ASSEMBLY**

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June 16, 1973 Germany 2330772

[52] **U.S. Cl.** **52/585**; 52/307; 52/589

[51] **Int. Cl.**[2] **E04C 1/14**; E04C 1/42

[58] **Field of Search** 52/582, 583, 585, 586, 52/589, 475, 476, 306–308, 315, 656

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Primary Examiner—Ernest R. Purser
Assistant Examiner—James L. Ridgill, Jr.
Attorney, Agent, or Firm—Spencer & Kaye

[57] **ABSTRACT**

A multisided building block having a cavity along each side in a peripheral zone of the block and an outwardly directed open socket held within the cavity. In an adjoining position of two building blocks, a socket belonging to one block is aligned with, and is in a close vicinity of a socket belonging to the other, adjoining block. There are further provided plugs, each conforming in shape to the socket opening and positioned within the aligned sockets for interconnecting the same.

5 Claims, 14 Drawing Figures

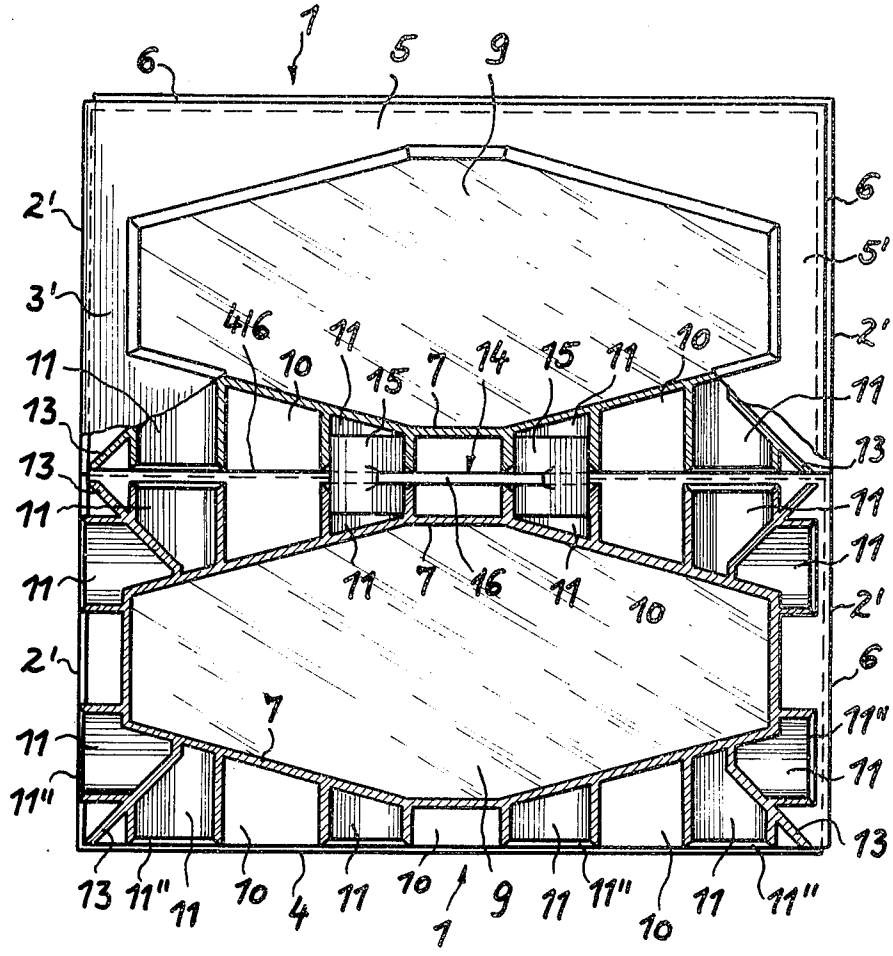


Fig. 1

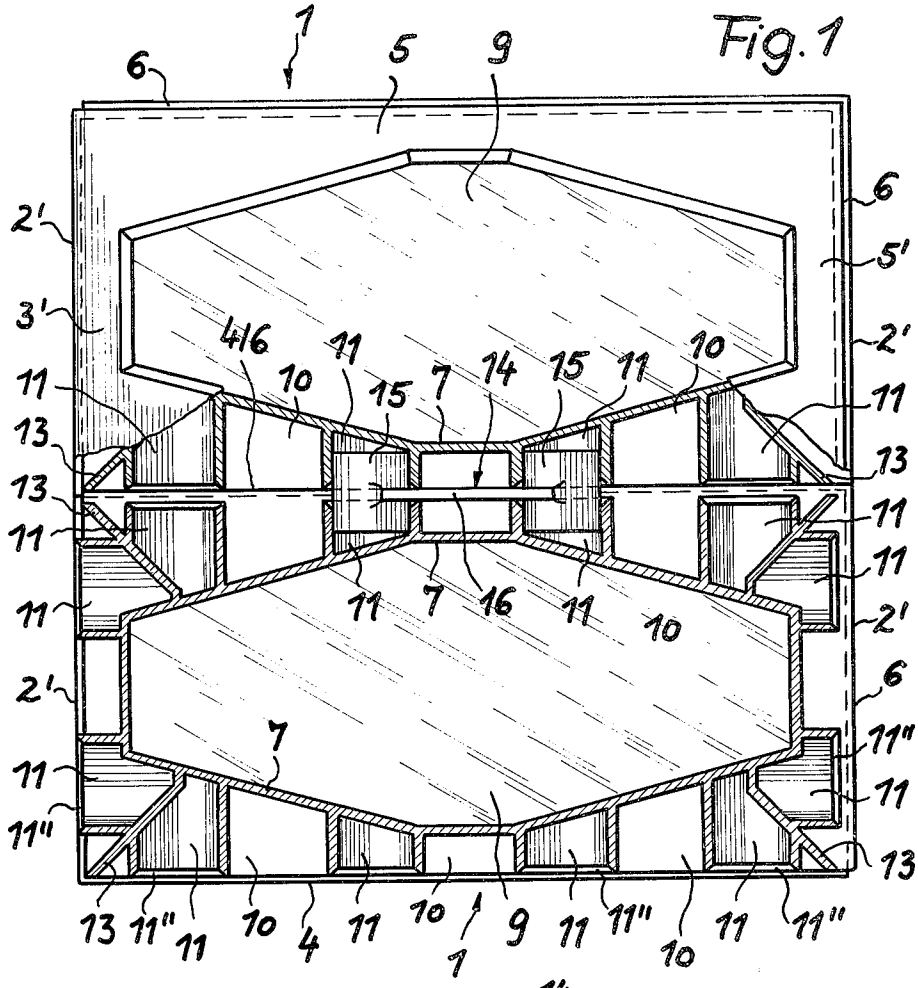


Fig. 2

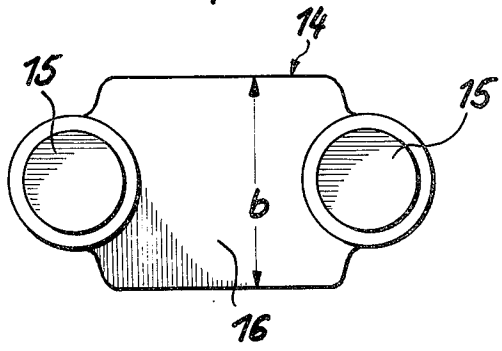


Fig. 3

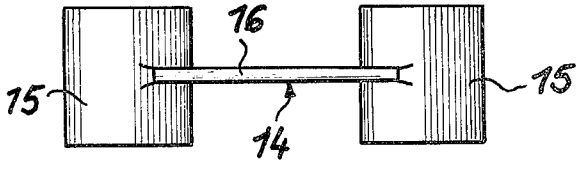


Fig. 4a

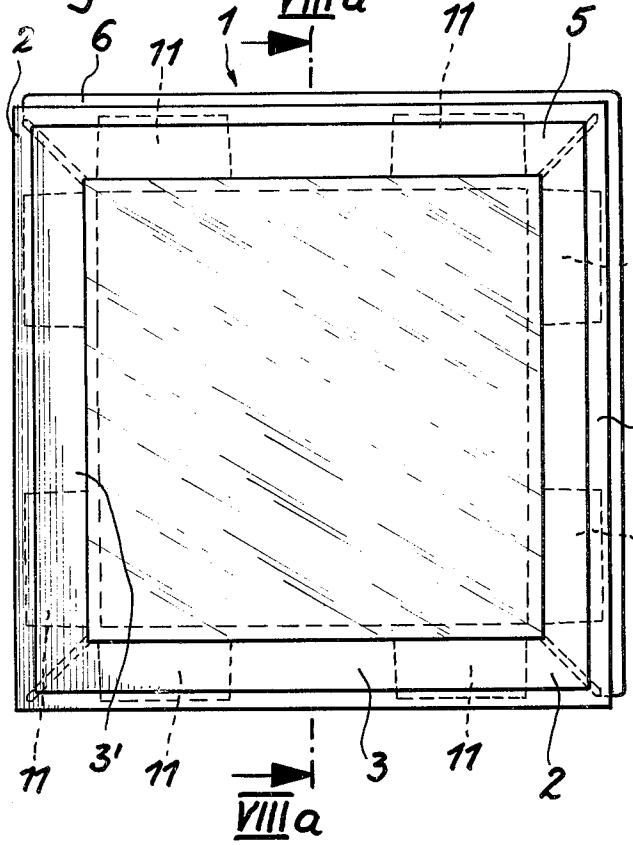


Fig. 8a

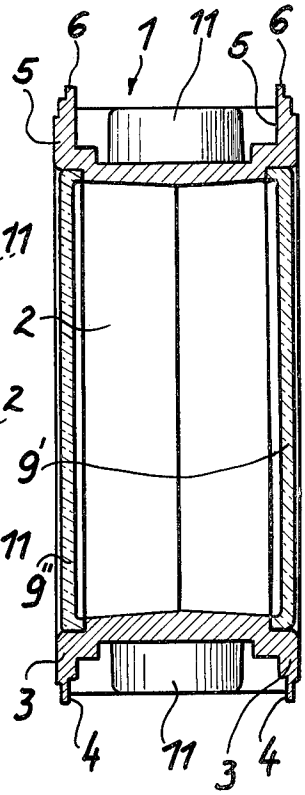


Fig. 9

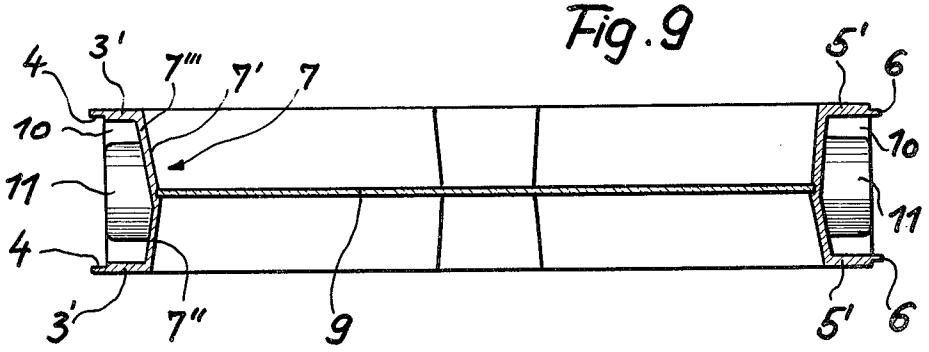


Fig. 4

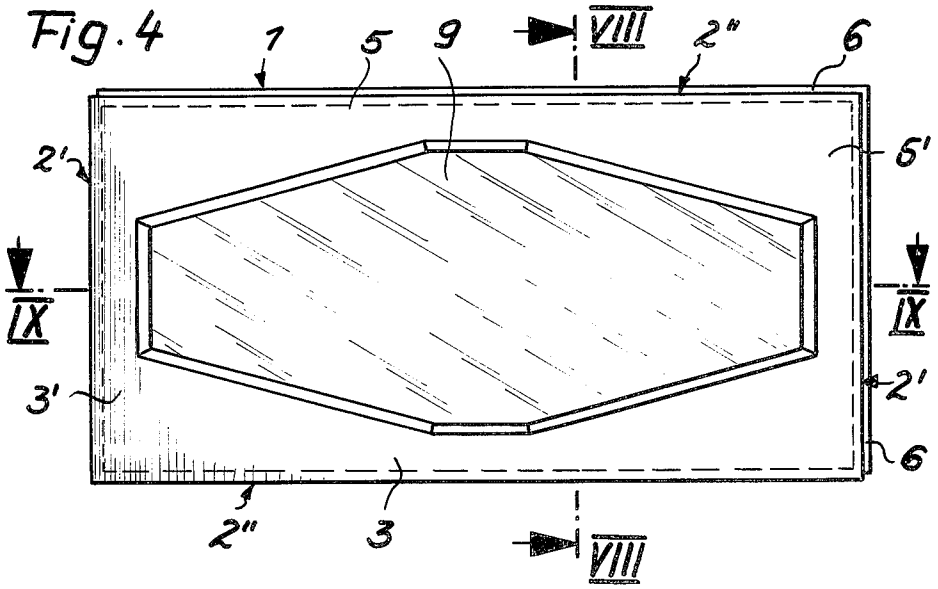


Fig. 5

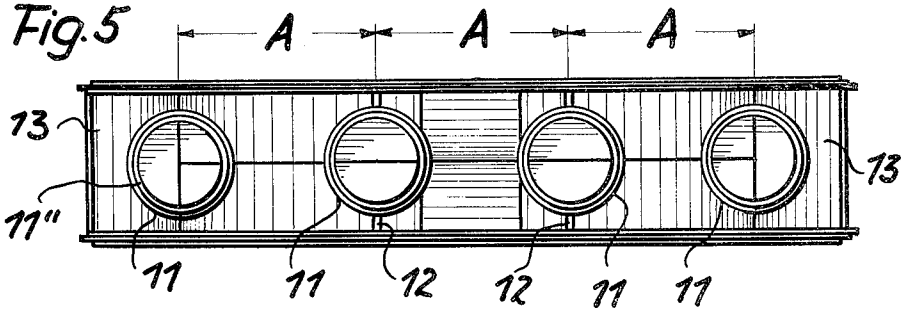


Fig. 6

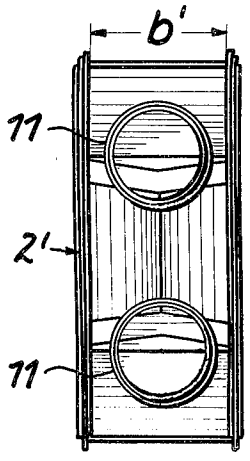


Fig. 7

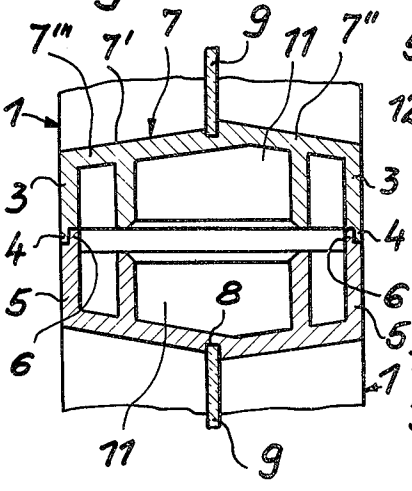


Fig. 8

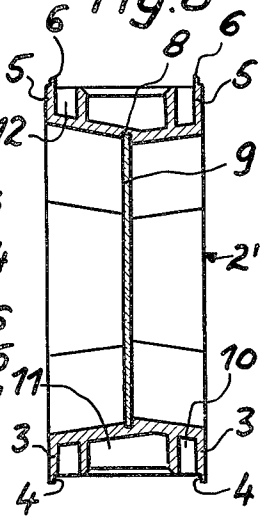


Fig. 10

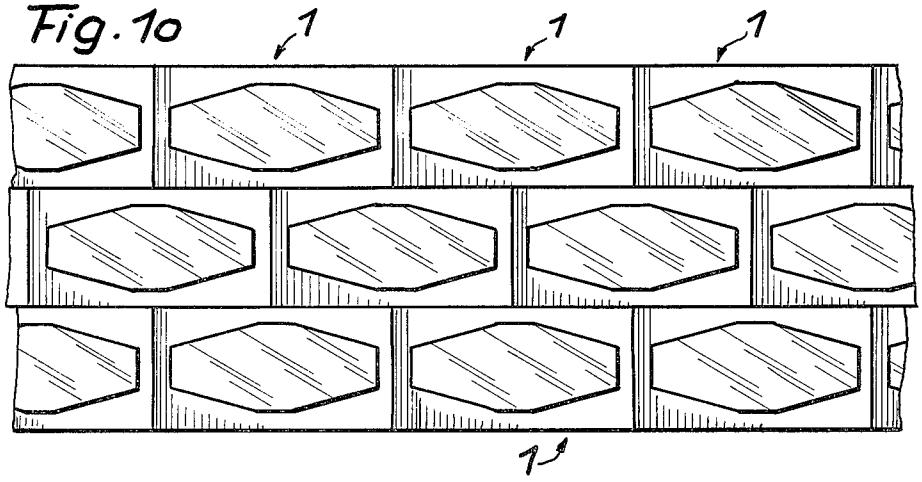


Fig. 11

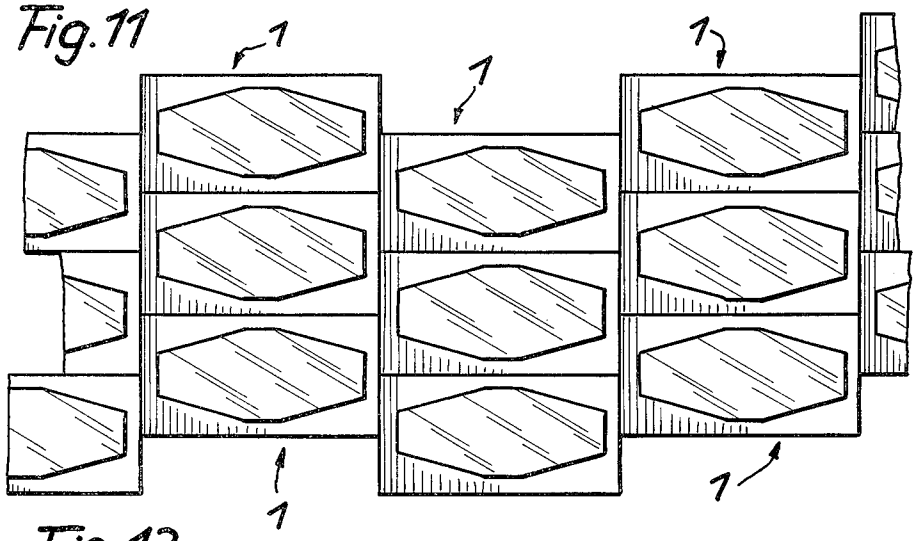
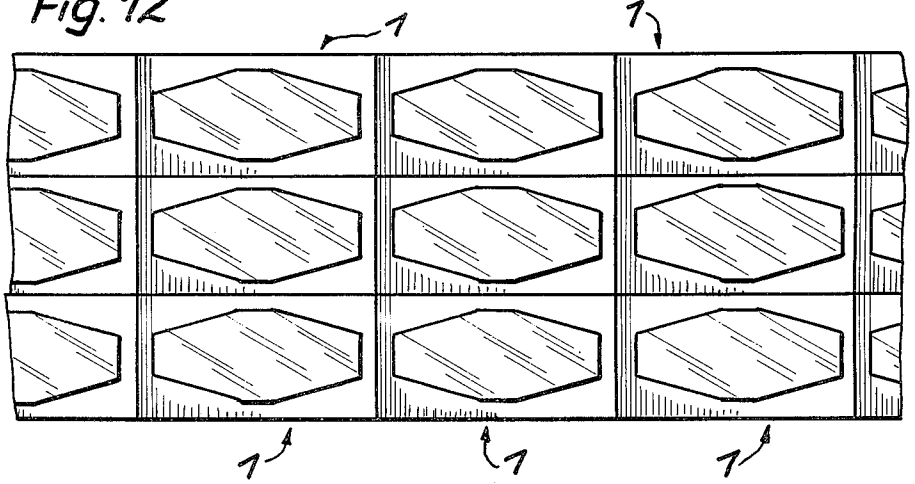


Fig. 12



BUILDING BLOCK ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to a building block particularly for ornamental purposes and is of the type that usually has an outer frame serving as a carrier for a panel which is made of artificial glass or the like and which is preferably disposed in the longitudinal central plane of the outer frame.

Building blocks of the afore-outlined type are generally known. According to a conventional structure, the individual building blocks can be attached to one another by mutual anchoring, to form a wall. The anchoring of the individual building blocks to one another is conventionally accomplished by means of groove and tongue joints. The disadvantage of such an anchoring connection resides in the fact that the individual building blocks can be anchored to one another only by sliding one block into the other. If a great number of such building blocks is to be used for obtaining a large wall, substantial labor is required because of the relatively long sliding displacement necessary for each individual building block. It is a further disadvantage of the above-outlined known arrangement that during the sliding of a building block in and with respect to another, the guidance is usually not smooth and may even be impeded between the individual building blocks at the locations of seams.

SUMMARY OF THE INVENTION

It is an object of the invention to provide an improved building block of the afore-outlined type which is simple to manufacture and which makes possible an uncomplicated assembly of the blocks in the shortest period of time and ensures, despite a light-weight structure, a high stability of the wall formed by the building blocks.

This object and others to become apparent as the specification progresses are accomplished by the invention, according to which, briefly stated, the multisided building block has a cavity along each side in a peripheral zone of the block and an outwardly directed open socket held within the cavity. In an adjoining position of two building blocks, a socket belonging to one block is aligned with, and is in a close vicinity of a socket belonging to the other, adjoining block. There are further provided plugs, each conforming in shape to the socket opening and positioned within the aligned sockets for interconnecting the same.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevational view, partially broken away, of two interconnected building blocks designed according to a preferred embodiment.

FIG. **2** is a top plan view of a component shown in FIG. **1.**

FIG. **3** is a side elevational view of the component shown in FIG. **2.**

FIG. **4** is a front elevational view of one building block designed according to the same embodiment.

FIG. **4***a* is a front elevational view of a building block designed according to another preferred embodiment.

FIG. **5** is a top plan view of the building block illustrated in FIG. **4.**

FIG. **6** is a side elevational view of the building block illustrated in FIG. **4.**

FIG. **7** is an enlarged side elevational view of the location of connection between two building blocks according to FIG. **1.**

FIG. **8** is a sectional view taken along line VIII—VIII of FIG. **4.**

FIG. **8***a* is a sectional view taken along line VIIIa—VIIIa of FIG. **4***a.*

FIG. **9** is a sectional view taken along line IX—IX of FIG. **4.**

FIGS. **10, 11** and **12** illustrate front elevational views of a plurality of interconnected building blocks in three different types of arrangement.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to FIGS. **1, 4** and **9,** the building block generally indicated at **1** and constituting a preferred embodiment of the invention has a rectangular frame **2** of generally U-shaped section. It is expedient to so dimension the building block **1** that the length of a long side **2''** of the frame **2** is an integer multiple (expediently double) of the length of a short side **2'**. As it may be observed, the outwardly directed free legs of the U-shaped frame **2** are designated at **3'** along one short side **2'** of the frame **2** and at **5'** along the other short side **2'**. Further, the free legs are designated at **3** along one long side **2''** of the frame **2** and at **5** along the other long side **2''**. Each leg has, along its outer, marginal zone, a rib-and-shoulder formation. In the rib-and-shoulder **4** of the adjoining legs **3** and **3'** the shoulders are oriented towards one another, while in the rib-and-shoulder **6** of the adjoining legs **5** and **5'** the shoulders are facing away from one another. Stated differently, the rib-and-shoulder formations in the legs of each frame side are oppositely oriented with respect to those in the opposite, parallel frame side. As a result, as it may be well observed in FIG. **7,** adjoining building blocks **1** fit into one another by virtue of the complemental, conforming, interfitting relationship between a rib-and-shoulder formation **4** associated with the one building block and a rib-and-shoulder formation **6** associated with the other building block.

As further seen in FIG. **7,** each block frame **2** has at the outer face **7'** of its floor **7** a circumferential groove **8** for receiving edge zones of the block panel **9.** The floor **7** which is formed by the web or connecting part of the "U," is disposed at such an angle that the floor portion **7''** is elevated with respect to the adjacent floor portion **7'''** disposed at the other side of the panel face. The panel **9** may be snapped or shrunk-fitted into the groove **8** and, because of the higher position of the floor portion **7''**, it is supported to a greater extent in the zone of the floor portion **7''** than in the zone of the floor portion **7'''**.

Between the parallel frame legs along each side, that is, in the peripheral zone of the building block **1,** there are provided outwardly open cavities **10.** In the inner spaces or cavities **10** there are provided outwardly oriented and outwardly open sockets **11** which extend from the floor **7** and which are uniformly spaced from one another. In any two adjoining building blocks **1** the distance of a corner socket belonging to one building block from an adjacent corner socket belonging to the other, adjoining building block is identical to the distance A between sockets **11** within one building block, as it may be observed in FIG. **5.** Stated differently — and as it may also be seen in FIG. **5** — the distance A between the centers of two adjoining sockets **11** is

twice the distance between the center of an outermost socket and the adjacent end of the block side. The socket edge 11' of each socket 11 is inwardly chamfered, as it may be observed, for example, in FIG. 1. It may also be seen that the sockets 11 do not project beyond the outline of the building block. Preferably, the socket edge 11' is slightly recessed from the block outline. The middle sockets 11 in the frame sides 2'' are connected with the legs of the U-frame 2 by means of transverse bridge members 12 (FIG. 5). The corner sockets 11 extend in a miter joint-like manner from oblique walls 13 in the inner spaces 10 of the frame 2, as best seen in FIG. 1.

The building blocks 1 are connectable to one another by means of a connecting element 14 as it may be observed in FIGS. 1, 2 and 3. The connecting element 14 comprises two hollow connecting plugs 15 which are secured together by means of a web 16. The web 16 has a width *b* which corresponds to the inner distance *b'* (FIG. 6) between the parallel-extending legs of the U-frame. As it may be observed in FIGS. 2 and 3, the web 16 is attached to the plugs 15 in such a manner that it surrounds about one half the circumference of the plugs 15. The center-to-center distance between the two interconnected plugs 15 is identical to the distance A between two sockets 11. The connecting element 14 may be inserted either along the long frame side 2'' or the short frame side 2' into aligned sockets 11 of two adjoining building blocks 1. As it is illustrated in FIGS. 10, 11 and 12, the building blocks may be secured to one another in different patterns (aligned or staggered) to form a wall surface. It is feasible — especially in case of vertically superposed adjoining building blocks — to use a connecting element formed but of a single plug 15.

Turning now to FIGS. 4*a* and 8*a*, the exemplary embodiment of the building block illustrated therein differs from the previously described embodiment essentially only in that instead of a sole central panel 9, the block frame supports two parallel-spaced panels 9' and 9'' on either side of a central plane passing through the building block.

It may be feasible, however, to practice the invention in a building block body which lacks separate frame and panel components.

By virtue of the invention as described above, there are provided building blocks which may be rapidly assembled to form a wall having an optimal stability. The U-shaped frame ensures that the building block has very small weight but has nevertheless an optimal rigidity. The sockets 11 which are accommodated in the outwardly directed, inner space 10 defined by the legs and web of the U-frame, further increase the stability of the building block. The connecting plugs 15 provided for anchoring two adjoining building blocks to one another are entirely hidden from view and are also accommodated within the space 10. The sockets 11 as well as the connecting plugs 15 may have, for example, a circular or polygonal cross section. Each connecting plug, by virtue of its penetration by one-half of its length into the socket in one building block and by the other half of its length into the aligned socket of the adjoining building block ensures a great built-in stability in the transversal direction between the blocks. By virtue of connecting two plugs 15 with a web 16, in addition to a vertical connection, the building blocks can also be arranged horizontally side-by-side in which case the web 16 is preferably dimensioned in such a manner that it lies without play between the legs of the U-shaped frame. In this manner, a substantial stability against twisting is ensured between horizontally adjoining building blocks. The preferably hollow connecting plugs 15 have, despite their small weight, an excellent stabilizing effect; they may be made in a simple and economical manner with substantial savings of material. By virtue of the particular, interfitting cross-sectional shape of the frame legs, the building blocks may be attached to one another practically without clearance and thus in a substantially water-tight manner. The interengaging, overlapping arrangement of the rib-and-shoulder formations is present at all sides of the building block and thus the stability of the wall is further increased. This design makes possible in various mutual arrangements of the building blocks, as illustrated in FIGS. 10, 11 and 12, a secure and stable connection between the individual building blocks. Further, the deformation stability of the individual building blocks when exposed to weather effects is ensured in a very satisfactory manner. The relatively long frame sides are connected section-wise and thus are maintained in a parallel relationship even in case of extreme heat or cold. The oblique walls 13 at the corners of the inner spaces 10 of the frame serve in a favorable manner for stabilizing simultaneously two mutually angularly arranged frame portions without disturbing the uniform distribution of the sockets 11. The connecting plugs 15 may be easily inserted into the inwardly chamfered openings of the sockets, but once inserted, they are held without play. It is feasible to provide conically shaped connecting plugs to further enhance a clearance-free positioning thereof in the sockets. In case the building blocks according to the invention are used for constructing outdoor walls, for example wind breakers for terraces, it is expedient to ensure that, on the one hand, the block panel 9 is fixedly arranged within the building block and, on the other hand, any block panel is easily replaceable in case of damage. The higher floor portion 7'' of the frame with respect to the floor portion 7''' ensures that the panel 9 is protected by the more elevated portion 7'' against wind pressure (FIG. 7). For replacing a damaged panel, the latter may simply be pushed out in the direction of the lower frame floor portion 7'''. A new panel 9 may be snapped into the receiving groove 8 or, in case of a more solid block material, it may be shrunk-fitted by means of heating. The building blocks shown in FIGS. 1 and 4 are dimensioned in such a manner that two building blocks adjoining one another along their long sides complement each other into a square and thus the building blocks may be attached to one another alternatingly with horizontal and vertical orientation.

It will be understood that the above description of the present invention is susceptible to various modifications, changes and adaptations, and the same are intended to be comprehended within the meaning and range of equivalents of the appended claims.

I claim:

1. In a building block assembly, a building block having a four-sided frame and a panel surrounded by the frame; each frame side having longitudinally extending, parallel-spaced legs and an interconnecting floor together defining an outwardly open, generally U-shaped cross section, wherein the improvement comprises in combination:

a. a rib-and-shoulder formation provided on an outer zone of each leg on each side of the frame; the

shoulders of the rib-and-shoulder formation on two adjoining sides of the frame being oriented towards one another; the shoulders of the rib-and-shoulder formation on the other two adjoining sides of the frame being oriented away from one another;

b. a plurality of outwardly open, tubular sockets disposed centrally between the two legs of each frame side on the interconnecting floor and connected to the legs by transverse bridge members; said sockets being distributed along the length of each frame side; the distance between any adjoining two sockets in one frame side being twice the distance of an outermost socket from the adjacent end of the frame; each socket has a terminal edge that is recessed with respect to said outer edges of the legs; and

c. a removable and reinsertable coupling member conforming in shape to each socket opening for being received by the socket.

2. A building block as defined in claim **1,** wherein said sides consist of two long sides of equal length and two short sides of equal length, either of said long sides having a length that is an integer multiple of the length of either of said short sides.

3. A building block as defined in claim **1,** further including oblique walls, one positioned to extend to each intersection between two adjoining sides; the outermost socket on one side and the adjacent outermost socket of an adjoining side extend at right angles to one another outwardly from one and the same said oblique wall.

4. A building block as defined in claim **1,** wherein the coupling member is formed of a plurality of plugs conforming in shape to each socket opening for being received by the socket; and a web rigidly and permanently connecting said plugs with one another to define a distance therebetween that is identical to the distance between any two adjoining sockets in a frame side; said web having a width dimensioned to fit between the legs of any said frame side; said web having a thickness dimensioned to fit between the recessed terminal edges of two aligned sockets of two adjoining building blocks.

5. A building block as defined in claim **4,** wherein said plugs have a tubular configuration and said web connected to said plugs surrounds about one half of the circumference of said plugs.

* * * * *