

Nov. 16, 1971

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3,619,935

TOY BLOCKS

Filed July 3, 1969

4 Sheets-Sheet 1

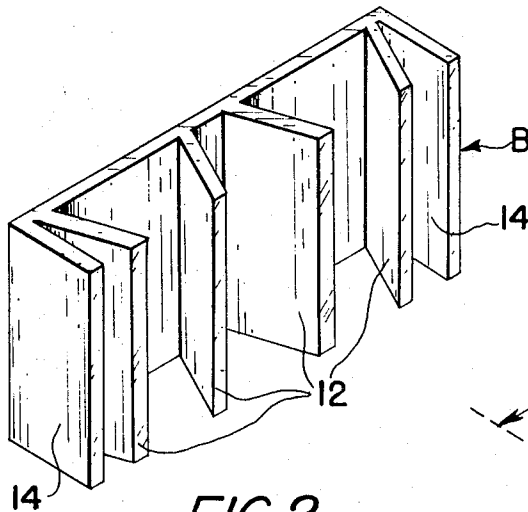


FIG. 2

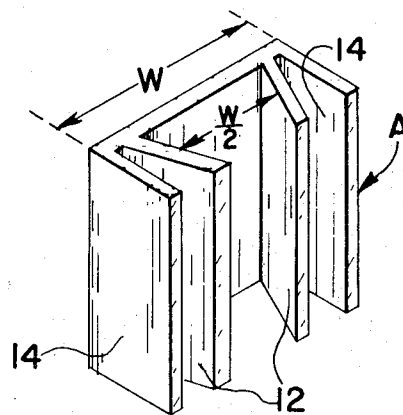


FIG. 1

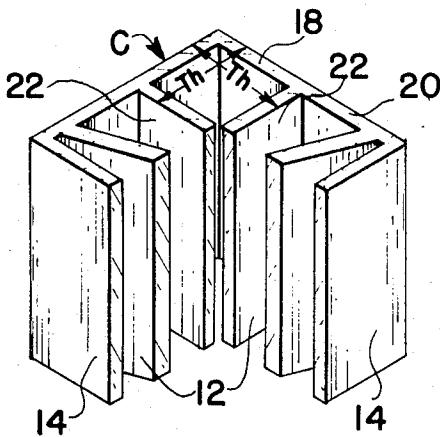


FIG. 3

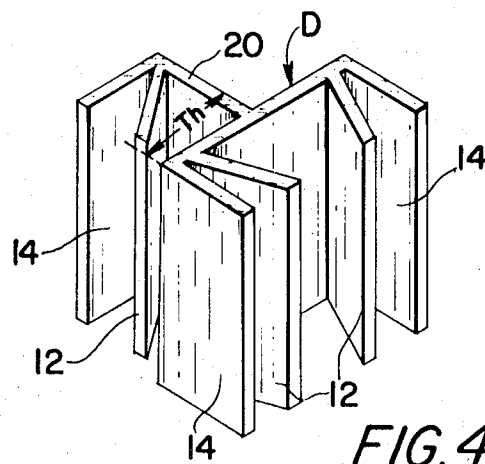


FIG. 4

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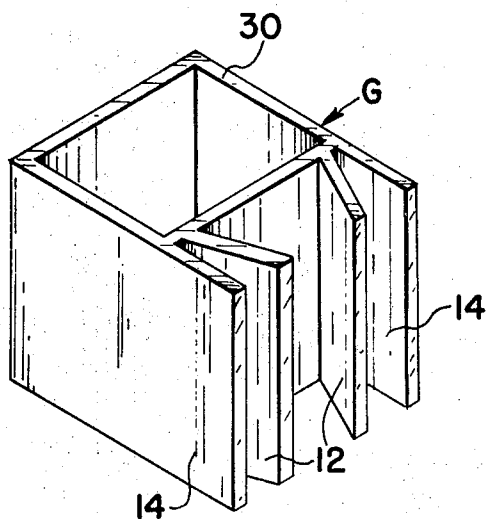


FIG. 7

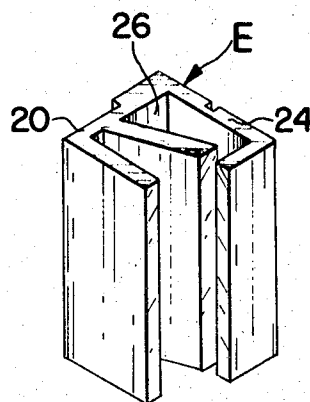


FIG. 5

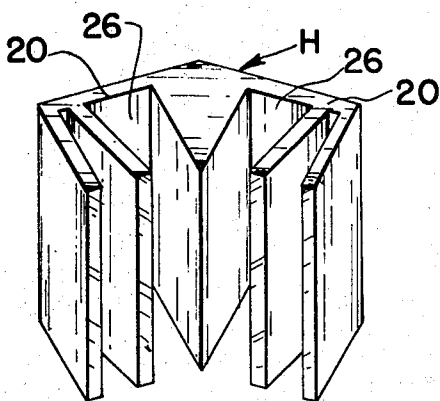


FIG. 8

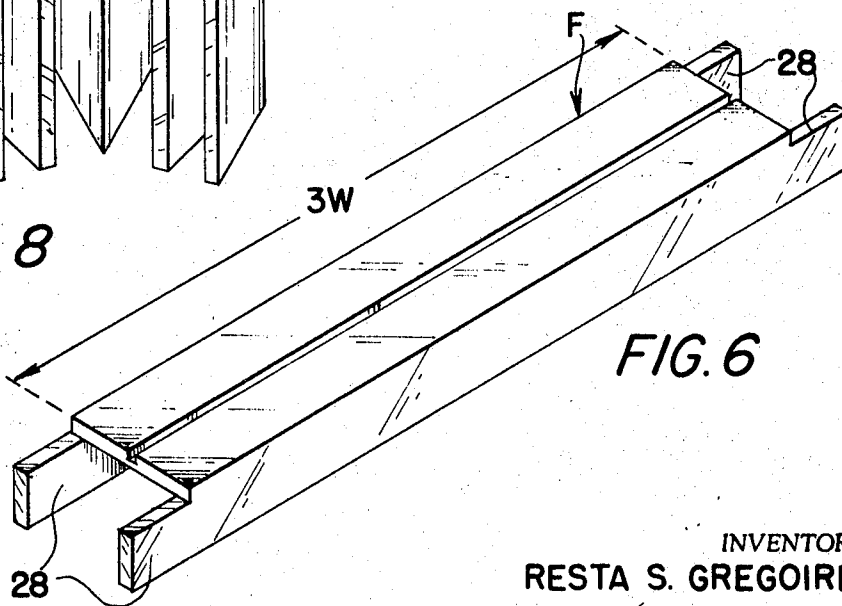


FIG. 6

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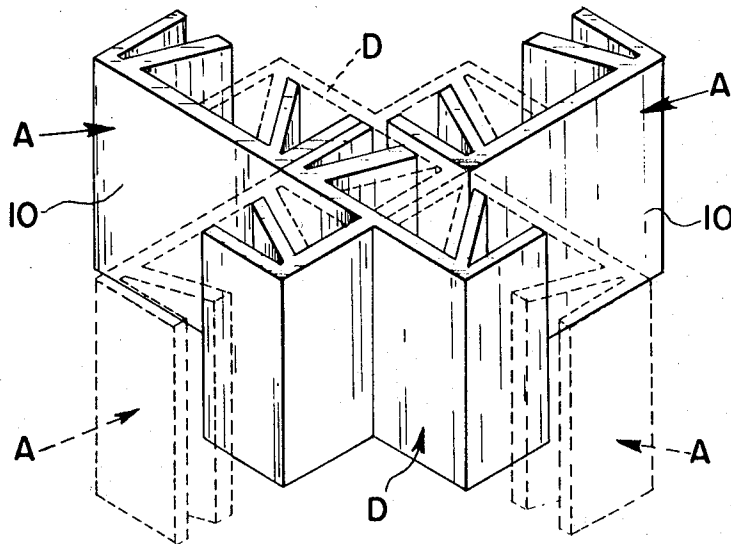


FIG. 10

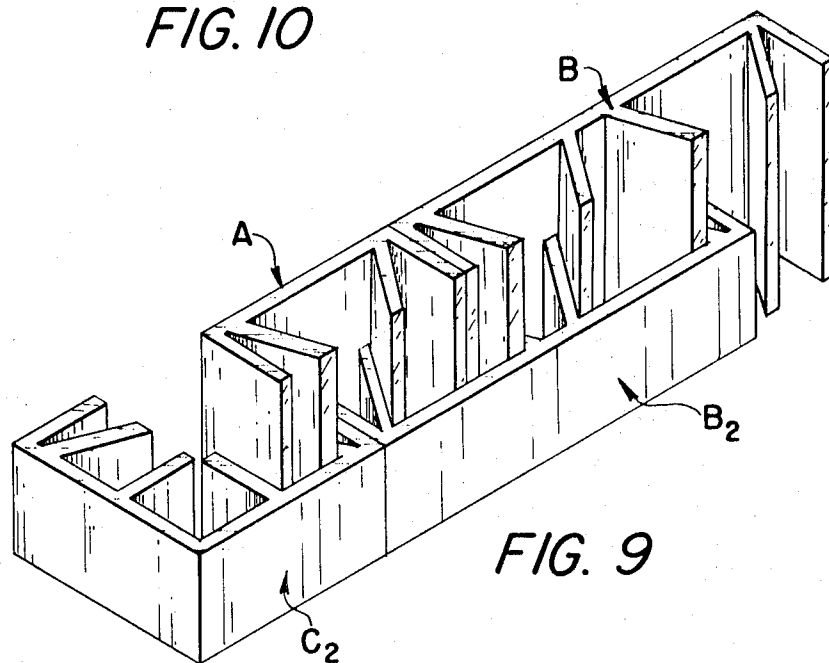


FIG. 9

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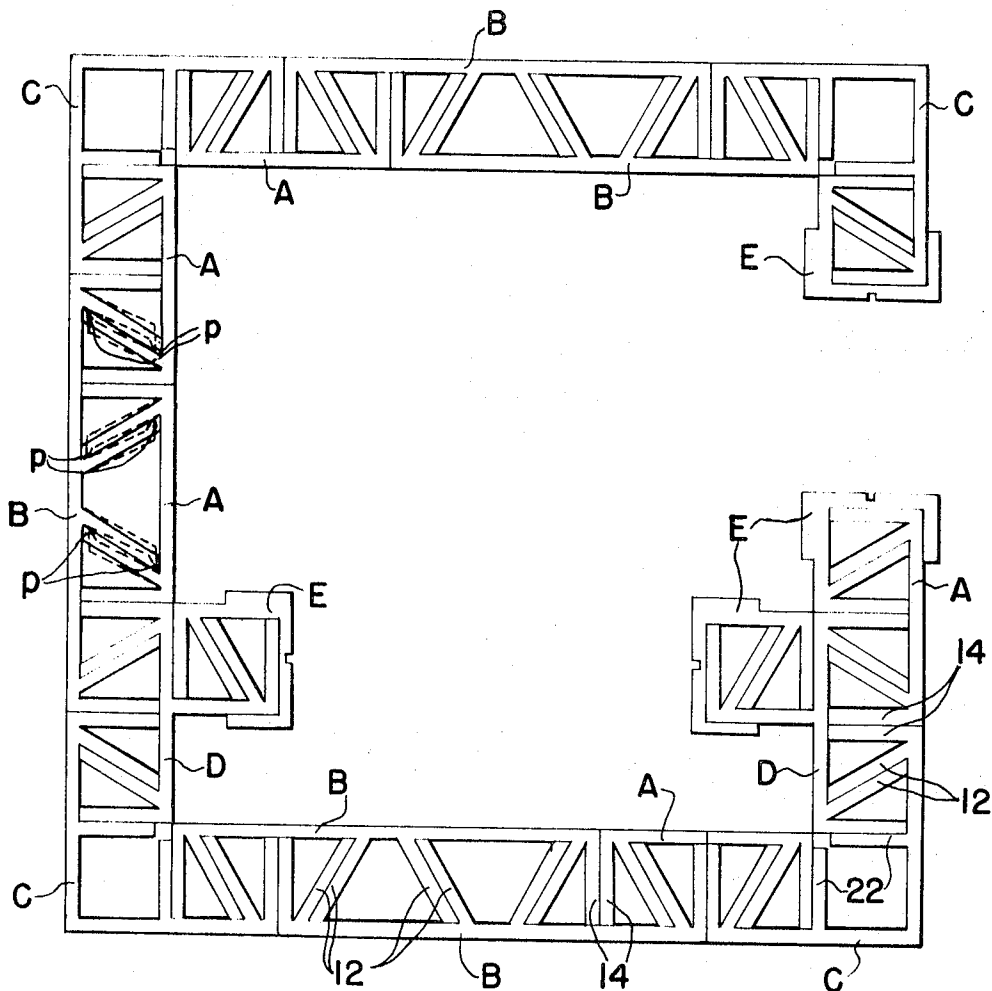


FIG. 11

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3,619,935
TOY BLOCKS

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Continuation-in-part of application Ser. No. 784,282,
Dec. 6, 1967. This application July 3, 1969, Ser.
No. 838,911

Int. Cl. A63h 33/06

U.S. Cl. 46—19

3 Claims

ABSTRACT OF THE DISCLOSURE

The set of eight basic forms of toy blocks includes an assortment of half height blocks of the wall layer forms, the aggregate total quantity of blocks in the set being sufficient to build a complete doll house or other building structure, with framed door and window openings in the walls and a roof, as may be desired. The blocks are laid in two interlocked layers to form the walls, by laying the rows or courses alternately in the opposite layers in vertically overlapping relation between the opposite rows, and the blocks in one layer horizontally overlapping the blocks in the other layer, and thus each block in one layer interlocks the corners of four adjacent blocks in the other layer, which it overlaps. The blocks are light and have a running fit between the blocks in the opposite layers into their sliding interlocks as they are laid, enabling any child to design the wall structure as he builds or removes some of the blocks, and changes the designs with the greatest of ease in accordance with his fancy, meanwhile learning while actually constructing.

This is a continuation-in-part of Ser. No. 784,282 filed Dec. 6, 1967 now abandoned.

There have been many different kinds of building block sets developed in the prior art which have interlocking means, but most of these means are of the snap interlock type which prevent a close laying of the adjacent blocks as seen from the outside and thus present an uneven and weak structure which cannot be made to anywhere near resemble a real building wall structure. The angular interlock flange means extending from the back of the faces of the blocks in the present structure are entirely hidden and provide a strong structure, neat in outside block appearance, just like the real building wall structures.

The present dovetail groove and ridge type of flange interlock blocks are fashioned after the disclosure of the skeleton interlock blocks for actual wall structures in the co-pending application above referred to, but is more adaptable for use in miniature building construction by children as well as grown-ups for entertainment and by architects and structural engineers for actual planning of their structural designs of walls, abutments, bridges, road beds, mosaic designs, etc., since these blocks may be made in various colors as well as black and white.

Obviously this same system of blocks comprising the eight basic forms illustrated here may be made in suitable sizes for actual commercial and private housing, in which event the designs of the blocks would be modified in accordance with the requirements of desirable strength and particular use characteristics.

The object of this invention is to make a toy block building set having angular flange interlocking blocks that will provide a substantially co-extensive outer face on both sides of the wall, with a joint pattern between the blocks that may be made selectively coordinate or the vertical joints in the successive courses might be horizontally staggered.

A further object is to make a durable toy block set which has blocks which are easily laid in courses in interlocked relations between the blocks in the opposite

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layers of the wall and around the corners of the walls as well as at the T and + wall connections, and includes jamb, window sill and door and window frame blocks for interlocking in a complete unitary block building structure, including 135°, 90° gable and slant roof slabs.

A further object is to provide a uniquely simple interlocked wall block structure kit having an assortment of eight basic forms of blocks for construction of complete building wall structures including framed window and door openings wherever desired in the wall and including a roof structure.

A further object is to provide an interlocked block wall structure having blocks laid to form one side layer of the wall, their inner faces provided with angular flange means extending therefrom to form interlocking sides of dovetail grooves and ridges for interlocking with like means formed on the innerfaces of the blocks in the opposite layer laid to form the other side layer of the wall.

Other and more specific objects will appear in the following detailed description of the invention as illustrated in the accompanying drawings, wherein:

FIG. 1 is the basic unit form of the building blocks of the present kit,

FIG. 2 shows a double unit form of the blocks included in the kit,

FIG. 3 illustrates a form of corner blocks,

FIG. 4 is a T wall connection form,

FIG. 5 is a form of jamb blocks,

FIG. 6 is a window or door frame form of blocks,

FIG. 7 shows a form of chimney forming type of blocks,

FIG. 8 is a 135° corner form,

FIG. 9 illustrates the beginning of the laying of a corner connected to a linear wall segment,

FIG. 10 shows how two T corner forms are interlocked to form a + wall connection, and

FIG. 11 illustrates the use of the several forms to construct a sample wall structure.

The block of unit form A, shown in FIG. 1, is used in laying linear wall segments. It has a plain surface outer face 10 (out of view in FIG. 1, but may be seen in FIG. 10), and a central groove defined by angularly extending flanges forming the sides 12 and having a median width equal to half the width W of the block. This groove is flanked by half dovetail ridges defined by the same angularly extending flanges to form the sides 12 and the normally extending flange forming the end sides 14 of the block. Some of the unit form of blocks are made of half the height, such as B₂ and C₂ shown in FIG. 9, for laying in the initial and final courses in the opposite layers of a wall to provide a square start and finish edge thereto.

A linear wall segment may be built by starting with a course of these half height blocks laid end to end on a flat surface with their outer faces lined up in one layer of the wall, then a course of these full unit blocks is laid by sliding them into interlocking relation over the adjacent half dovetail ridges and into the grooves of the blocks laid in the first course of the first layer to form the base of the other layer of the wall. The following courses of the full unit blocks are similarly interlocked in the alternate wall layers until a desired height of the wall is reached, and the last course laid comprises half blocks to finish the top of the wall squarely across the top of both layers.

This wall will present a coordinate arrangement of the blocks in each layer, although this pattern in one layer will be staggered both horizontally and vertically with respect to the pattern in the other layer.

Blocks of the form B, shown in FIG. 2 are composed of a compound or two-unit form with their adjacent end sides 14 removed, and may be used in any assortment

with the unit form A blocks in either or both layers of a linear segment of wall in the same manner as described above. By using blocks of this double unit form the vertical joints in successive courses in either layer may be staggered as may be desired.

Form C, shown in FIG. 3, is a corner block type having a square corner post portion 18 with sides substantially equal to the thickness of the wall T_h , and having half width block portions 20 extending from the two adjacent sides 22 of said post, their outer faces being co-extensive with the outer sides of said corner post portion 18, angular flanges 12 and 14 extending from their inner faces to form a half dovetail groove portion adjacent said corner post portion bounded by a half dovetail ridge portion at the outer ends thereof. A column of these corner blocks C may be laid in interlocking relation with the half width ends 20 of the corresponding courses in the inner layer of the linear segments of walls connected therewith. The block of form D shown in FIG. 4 is a T joint block having a unit block form with a half width block 20 extending from its outer face 10 at a point which spaces its outer face the thickness of the wall T_h from one end of said unit block form. A column of these blocks may be laid in interlocking relation with corresponding half width block extensions 20 of three linear wall segments to form the T corner connection therein.

The jamb block form E shown in FIG. 5 is a half width block portion 20 with a frame portion 24 extending from the bottom 26 of its half dovetail groove portion around the end side of the interlocking block in the edge of the corresponding wall segment, defining the side of an opening such as a window or a door in the wall structure.

The block form F shown in FIG. 6 is a still frame block which fits over the wall portion equal to three unit block widths in length at the bottom or top of a window or door opening in said wall and has the ends 28 of the frame portions interlocked by the adjacent jamb blocks E.

The block form G shown in FIG. 7 has a chimney or hollow column portion 30 extending from its outer face and may be used in a wall structure to form chimneys or for other obvious purposes.

The block form H shown in FIG. 8 is a 45° wall deflection block for connecting two wall segments at a 135° internal corner for use in an octagon walled structure or for building a 135° gabled roof slab to place over a corresponding rectangular wall, etc. The gable ends of the wall may be built up to a peak for supporting the gable roof ridge portion at a suitable height without necessarily closing the entire gable end area of the wall, the open spaces being hidden by the eaves of the roof overhanging the end walls. These openings may obviously be filled in by improvised means for closing them if desired, in the completed structure.

Thus this system of eight basic forms which are easily mass produced by extrusion from suitable plastic or metal materials and cutting them to unit lengths (block heights) with some of the linear wall blocks being cut in half heights for use in the initial and final courses in a wall of definite height, is sufficient to provide experimentation in the building of a wide range of structural designs including a complete building wall and roof structure with openings for any doors or windows desired.

FIG. 10 shows how a cross wall corner connection may be built, using two block forms D interlocked in inverse relation, as indicated, to bring the cross wall segments connected to opposite face extensions into alignment.

In FIG. 9 the initial half height block forms B_2 and C_2 are laid in the outer layer at the base to form a corner connected to a wall segment formed by adding full height blocks in the inner layer, such as the forms A and B, interlocked with this outer layer base, and by adding courses thereon alternately in the outer and inner layers until the desired height is reached.

Children can learn a great deal more about coordination of structures and about creating new designs from

the use of these actual structural blocks than they could from any other type of block materials in the toy field.

Likewise, architects and engineers will find this system very useful in designing prototype models of their creative structures as well as in their experimentations and teaching architectural design in a very practical way.

Many obvious modifications in form and engagement of parts in the interlocking means of these forms may be made without departing from the spirit and scope of the present invention.

For example, the interlocking of the parts at the extremities of the median widths of the grooves and ridges may be obtained by a snapping engagement of the diagonal sides of the dovetail forms if they were extended from the outer ends of the end sides instead of being extended from the inner face of the blocks as illustrated, and if they would be curved to a radius that would make them tangent to their diagonal direction at a point just outwardly of the median width plane of the dovetail groove portion, thus providing bulges on the interlocking parts over which these parts may be snapped into engagement by pressing the blocks together in the opposite layers of the wall, instead of sliding them into place in the successive courses. Thus, while the sliding interlock would still be possible in this snap type interlocks, they could be also individually pulled out from any part of a wall segment and replaced by another snap block without dismantling the portion of the wall above them as is necessary in the forms of interlocks shown in the basic forms.

Some of these modified forms of blocks could also be made by brake forming methods from sheet strip materials, and for some purposes would be preferable from the standpoint of durability, economy or practicability for engineers and architects, who might sometimes wish to change the blocks in some parts of the completed portions of a wall without each time necessitating elaborate dismantling and reconstructing large portions of the wall.

Regardless of the method of production of these blocks in their basic forms, it is very difficult to obtain a good running fit of the interlocking sliding surface contacts.

In order to relieve any binding effects of too close tolerances between these surfaces on the sides of the dovetail members, these sides may be shortened to prevent their ends binding and to permit some flexure thereof to provide a good running fit without binding, and the edge ridges p shown dotted in a portion of FIG. 11, may be provided at the shortened ends of these sides to bear against the opposite dovetail sides 12 in a line contact, with little sliding friction and no binding between the surfaces allowing much greater dimensional tolerances without loss of the good running fit between the blocks.

What is claimed is:

1. A toy building block kit comprising

an assortment of block forms adapted to be laid in overlapping relation in two opposite side layers of a wall to be built thereof, and in interlocking relation between the opposed blocks therein, and one of said block forms being

a unit block having a planar rectangular outer face for lining up with like faces of other unit blocks forming one side of said wall, and interlocking means on its inner faces adapted for slidably interlocking with like interlocking means on the inner faces of unit blocks having their outer faces lined up in the other side of the wall, in horizontally and vertically overlapping relation to the outer faces of the blocks with which they interlock,

said interlocking means comprising

a central dovetail groove having a median width equal to half the width of said unit block and defined by its groove sides extending from said inner face convergently to the inner faces of opposed blocks in the other side of the wall, said groove sides being in

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slidably interlocking engagement with corresponding groove sides of said opposed blocks,
 said groove being flanked by half dovetail ridges having half the width of said grooves and being defined by said groove sides and normally extending end sides based in the ends of the inner face of said unit block, and
 one of said block form being a T wall connection block comprising
 a unit block having a half width block portion extending from the outer face thereof.

2. A toy block building kit comprising
 an assortment of block forms adapted to be laid in overlapping relation in two opposite side layers of a wall to be built thereof, and in interlocking relation between the opposed blocks therein, and one of said blocks forms being
 a unit block having a planar rectangular outer face for linking up with like faces of other unit blocks forming one side of said wall, and interlocking means on its inner face adapted for slidably interlocking with like interlocking means on the inner faces of unit blocks having their outer faces lined up in the other side of the wall, in horizontally and vertically overlapping relation to the outer faces of the blocks with which they interlock,
 said interlocking means comprising
 a central dovetail groove having a median width equal to half the width of said unit block and defined by its groove sides extending from said inner face convergently to the inner faces of opposed blocks in the other side of the wall, said groove sides being in slidably interlocking engagement with corresponding groove sides of said opposed blocks,
 said grooves being flanked by half dovetail ridges having half the width of said grooves and being defined by said groove sides and normally extending end sides based in the ends of the inner face of said unit block, and
 one of said block forms being a jamb block comprising
 a half width block portion provided with a frame portion extending from the side edge at the bottom of its half groove around the corresponding end of the wall to be built, to the other side of said wall end.

3. A toy block building kit for building double layer interlocked wall structures comprising
 an assortment of block forms adapted to be laid in overlapping relation in two opposite side layers of a wall to be built thereof, and in interlocking relation between the opposed blocks therein, and including
 a unit block form having a planar rectangular outer face for lining up with like faces of other unit blocks forming one side of said wall, and angularly interlocking flange means extending from its inner face adapted for slidably interlocking with like angular interlocking flange means extending from the inner faces of unit blocks having their outer faces lined up

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in the other side of the wall, in horizontally and vertically overlapping relation to the outer faces of the blocks with which they interlock,
 a double block form comprising two unit blocks joined at their side edges, the adjacent side edges of the component unit blocks being removed,
 a rectangular corner form comprising a hollow square post portion, the outer dimension of which is substantially equal to the thickness of the wall to be built, said corner post portion having its outer corner sides formed co-extensively with the outer faces of two half width block portions the inner face of which have a half dovetail groove portion next to the inner corner sides of said corner post portion bounded by a dovetail side formed by an angular flange extending from the inner face of the corresponding half width block portion, and a half ridge portion at the outer ends of said inner faces defined by said angular flanges forming said dovetail sides and normally extending flanges forming the end sides of said half width block portions,
 a 135° corner form comprising a corner post portion having its outer corner sides co-extensive with the outer faces of two half width block portions extending therefrom, the inner corner sides of said corner post portion forming a 45° angle and defining the normal side of the half dovetail groove in each half width block portion,
 a T wall connection form comprising a unit block having a half width block portion extending from the outer face thereof,
 a jamb block form comprising a half width block portion provided with a frame portion extending from the side edge at the bottom of its half groove around the corresponding end of the wall to be built, to the other side of said wall end,
 a chimney block form comprising a unit block having a hollow chimney portion defined by a perimetric enclosure of the same height as the block and extending outwardly from its outer face, and
 a sill-frame block form, whereby a complete block building structure may be built therefrom, the blocks being interlocked throughout without the use of any extraneous attaching or connecting means, and including completely framed door and window openings where desired, and gabled or slant roof structures.

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