

Jan. 10, 1933.

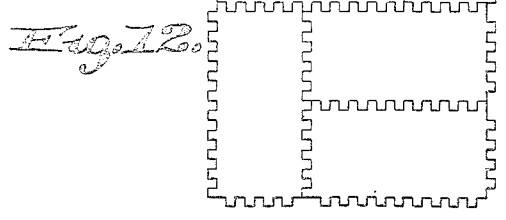
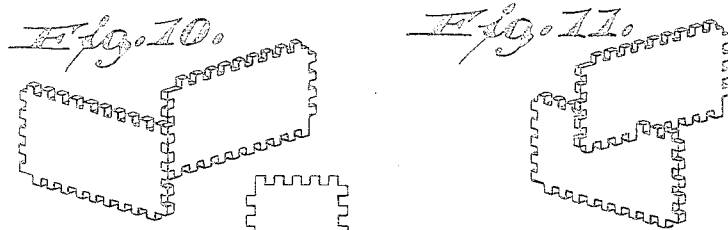
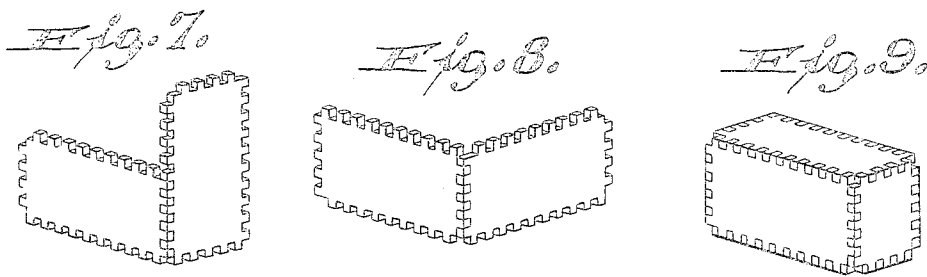
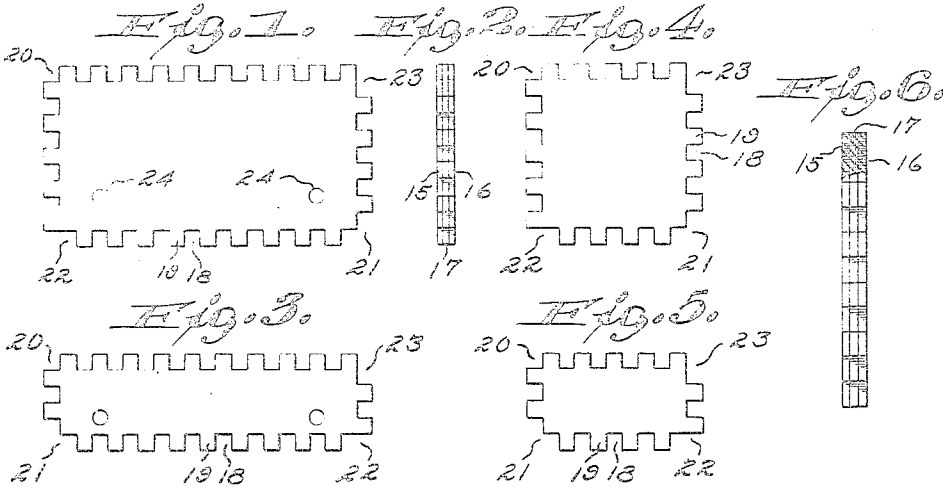
R. E. SANDERS

1,894,061

TOY CONSTRUCTION BLOCK

Filed April 8, 1931

2 Sheets-Sheet 1



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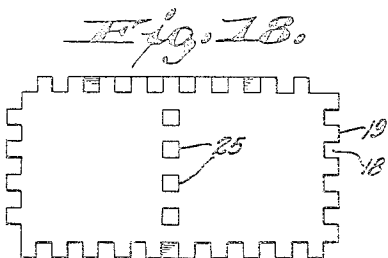
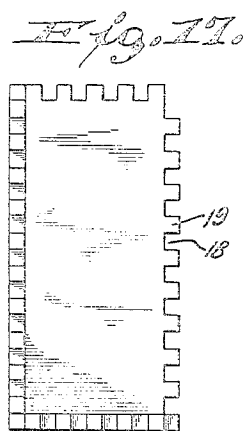
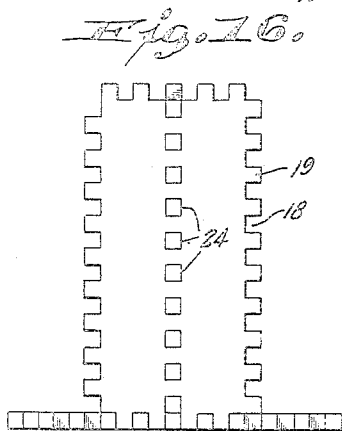
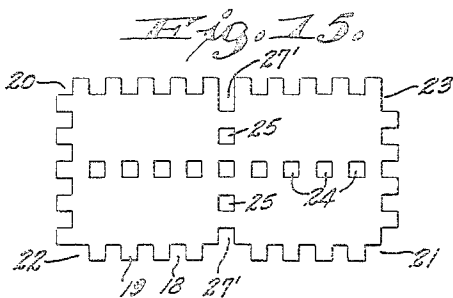
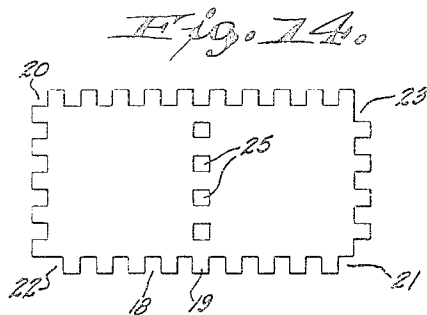
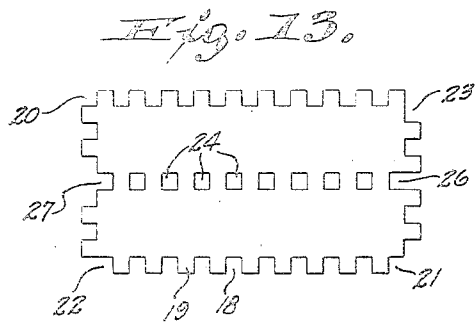
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1,894,061

TOY CONSTRUCTION BLOCK

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2 Sheets-Sheet 2



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TOY CONSTRUCTION BLOCK

Application filed April 8, 1931. Serial No. 528,470.

This invention relates in general to improvements in toys and particularly to toy construction blocks.

Heretofore, toy construction blocks having recesses and projections for interlocking engagement with one another have been so constructed that the use of the blocks is quite limited. This has been caused by the fact that these prior blocks have been formed to permit interconnection with one another only in particular ways. In order to make a construction block adapted for unlimited use, it is necessary that all edges thereof have a continuous series of relatively small interlocking member so that any two blocks can be interlocked at any edge and at any point in any edge, and so that they can be interlocked at angles with one another, if desired. Heretofore, it has been impossible to form a series of relatively small projections on all edges of wooden construction blocks, in view of the fact that projections extending transversely to the grain, where the projections are small, have little resistance to breakage. Formation of a continuous series of mortises and tenons on all edges of a block also presents the problem of constructing the corners so that when two blocks are joined together in alinement that there will be no possibility of two tenons being juxtaposed to hinder the connection of another block.

It is a general object of the present invention to provide a series of simple, cheaply constructed, and easily interlocking blocks which may be combined with one another in an endless variety of ways to form miniature structures, furniture, implements, buildings, vehicles, machines with moving parts and the like.

A further object of this invention is to provide wooden construction blocks which embody a series of interlocking projections along all edges thereof, the said blocks being so constructed as to permit this formation of projections on all sides and still prevent the usual possibility of breakage of certain of the projections.

A further object of the invention is to provide construction blocks of uniform thickness, varying in length and width in definite

ratios and formed with a series of mortises and tenons on all edges so that any edge of one block will interlock snugly in parallel position or at right angles with any edge of any other block.

A further object of the invention is to provide construction blocks having all edges formed with mortises and tenons which extend continuously and uniformly around the block except at certain of the corners, and in which said corners are so formed as to prevent two tenons from becoming juxtaposed when the two blocks are joined to one another.

A more specific object of the invention is to provide construction blocks in which the mortises and tenons on two edges at right angles with one another are staggered with relation to the mortises and tenons on the other two edges of the block to permit interlocking of one edge of one block with the opposite edge of another block in such a way that the edges of the two blocks so interlocked are in perfect alignment.

A further object of the invention is to provide construction blocks which may have in addition to the edge mortises and tenons, rows of apertures within the outline of the blocks which apertures are adapted to snugly receive edge tenons of another block to increase the adaptability of the blocks.

A still further object of the invention is to provide construction blocks formed of plywood in which the grain of one layer extends transversely to the grain of an adjacent layer so as to render the interlocking projections or tenons on any side resistant to breakage.

With the above and other objects in view, the invention consists of the improved toy construction blocks and all its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings illustrating one complete embodiment of the preferred form of the invention in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a plan view of one type of rectangular block;

Fig. 2 is an edge view thereof;

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Fig. 3 is a plan view of a block having its length equal to the length of the block shown in Fig. 1, and its width one-half of the width of the block of Fig. 1;

5 Fig. 4 is a plan view of a block having its width equal to the width of the block in Fig. 1 and its length one-half of the length of said block.

10 Fig. 5 is a plan view of a block having a width equal to the width of the block of Fig. 3 and a length one-half the length of said block, the area of the blocks shown in Fig. 5 being one-fourth of the area of the block of Fig. 1 and one-half of the area of the block

15 of Fig. 4;

Fig. 6 is an enlarged edge view of one of the blocks, part being shown in section;

20 Figs. 7 to 12 inclusive are views showing blocks interconnected with one another in a number of different arrangements.

Figs. 13, 14, and 15 are plan views of different modified forms of blocks;

25 Fig. 16 is a front elevational view of a group of blocks showing how the modified form may be assembled;

Fig. 17 is a side view of said group of blocks; and

Fig. 18 is a bottom view thereof.

30 It is preferred to form all of the blocks from wood inasmuch as said material possesses sufficient durability to withstand handling, and has sufficient rigidity to form substantial structures. It is also preferred to utilize plywood as illustrated in Figs. 2 and 6,

35 and in the drawings three layers are shown, top and bottom layers 15 and 16 which have the grain running in one direction, and an intermediate layer 17 having the grain running in a transverse direction. The three

40 layers may be united by means of an adhesive or in any other suitable manner.

The blocks are arranged to be made in sets, each set comprising a sufficient number of blocks to make possible the building of relatively complicated structures. The majority of the blocks in the set will be of rectangular shape as shown in Figs. 1, 3, 4 and 5, and said rectangular blocks vary in size, the larger blocks being exact multiples in area of smaller blocks. For example, the blocks shown in Fig. 1 have twice the area of the blocks of Figs. 3 and 4, and four times the area of the blocks of Fig. 5, and the blocks of Figs. 3 and 4 have twice the area of the blocks of Fig. 5. By having the blocks formed so that larger ones are exact multiples of smaller ones, they are much more adaptable and can be used to form an endless variety of either open or closed structures.

60 An important feature of the invention resides in the fact that each block is formed with a continuous series of alternating mortises 18 and tenons 19 along all edges, said mortises and tenons being relatively small in size. As shown in Fig 2, the thick-

ness of the blocks is substantially equal to the width and depth of the mortises. Furthermore, each of the mortises and tenons is substantially square. With this arrangement, two blocks may be interconnected in planes 70 at right angles to one another, and the ends of the tenons of one block will be flush with the surface of the other block to make a flush corner construction. Furthermore, by preserving the ratio between the thickness of the 75 blocks and the size of the mortises, the blocks may be interconnected edgewise at right angle to one another as shown in Fig. 11. Due to the uniformity in size of all of the mortises and tenons, there will be a snug engagement 80 of one block with another, and this engagement will be possible at any point, making the blocks very adaptable.

It is further to be noted that the mortises and tenons extend continuously and uniformly 85 around the blocks except at certain of the corners which are formed in a novel manner to prevent two tenons from being juxtaposed when two blocks are joined to one another with edges in alinement. This corner 90 arrangement, which also aids in obtaining staggering of the tenons on one edge with relation to the tenons on an opposite edge, will be hereinafter described in detail.

Another important feature of the invention 95 resides in the possibility of forming an enclosed or box-like structure as shown in Fig. 9. This is brought about by the peculiar arrangement of the mortises and tenons along one edge of a block with relation to 100 the mortises and tenons along the opposite edge. Referring to Fig. 1, it will be noted that the tenons along the upper edge of the block are uniformly staggered with relation to the tenons on the lower edge, and that 105 the tenons on the right hand edge of the block of Fig. 1 are similarly staggered with relation to the tenons on the left hand edge. This arrangement is brought about by having a single vacant space 20 equal to the size of 110 a single tenon at one corner of the block, by having an angular space 21 at the diagonally opposite corner of the block which is equal to the size of three tenons, by having a double space 22 of rectangular form equal to the size 115 of two tenons omitted from another corner, and by having another rectangular space 23 equal to the size of two tenons on the remaining corner of the block, said rectangular space 23 extending at right angles to the 120 space 22. The block illustrated in Fig. 4 is provided with a similar arrangement of mortises and tenons to the block of Fig. 1.

It is also necessary, in some of the smaller blocks, to have the corner recesses 21 and 22 125 reversed in position as shown in Figs. 3 and 5 in order to have the tenons on the end edges work out correctly. With this staggered arrangement, one long edge of the block shown in Fig. 1 may be interlocked with the 130

opposite edge of a block of similar length, leaving the ends of the two blocks flush with one another, and one end edge of the block shown in Fig. 1 may be interlocked with the opposite end edge of another block of similar width, leaving the sides in alignment as shown in Fig. 12. Other sizes of the blocks are similarly interconnectable with one another. Any edge of any block may also be connected at any point with any edge of any other block in either the manner shown in Fig. 10 or Fig. 11. Thus, practically any type of interconnection may be obtained, and the child will be in no way hampered by limited possibilities.

Due to the formation of the blocks of plywood with the grain of one layer extending transversely to the grain of another layer, the relatively small tenons may be formed in a continuous series along all edges, and all of these tenons will be resistant to breakage. If a continuous series of tenons were formed along all edges of an ordinary piece of wood, the tenons projecting transversely to the grain of the wood would readily break off and render the blocks unfit for future use. The particular construction of the material is, therefore, of utmost importance as it contributes in an important way to the adaptability of the blocks.

In the form of the invention illustrated in Fig. 13 a block similar to that of Fig. 1 is shown. This block, however, is formed with a row of spaced apart apertures 24 which bisects the block longitudinally. The apertures are each of a size to snugly receive one of the edge tenons 19 of another block, and the apertures in the row are spaced from one another a distance equal to the distance between adjacent edge tenons.

In Fig. 14 a block of similar shape and size is shown in which there is a transversely extending row of spaced apart apertures 25, the said apertures being of the same size as the apertures 24 of Fig. 13 and being spaced apart a distance equivalent to the spacing of the apertures 24.

In Fig. 15 a block is illustrated having both transversely extending apertures 25 and longitudinally extending apertures 24. By having a number of blocks in each set formed in accordance with the showings of Figs. 13, 14, and 15, the edge of one block may be joined to the center of another by inserting the tenons 19 on an edge of a block into the apertures 24 or 25 of another block. Thus the adaptability of the blocks is materially increased, and a number of different arrangements, such as that shown in Figs. 16-18, are made possible.

Due to the staggered arrangement of the mortises and tenons on one edge of a block with relation to the mortises and tenons on an opposite edge, two arrangements of apertures 24 are necessary, and also two arrange-

ments of the apertures 25. With the arrangement of apertures 24 shown in Fig. 13, the mortise at one edge in line with the row of apertures is of double depth as at 26 and at the opposite edge the central tenon is omitted and a mortise 27 of double depth is substituted. This arrangement permits reception of the tenons on the upper edge of the block of Fig. 1 by the row of apertures leaving the edges of the blocks flush as shown in Fig. 16. If, however, it were attempted to insert the tenons on the lower edge of the block of Fig. 1 in the apertures 24 of the block of Fig. 13, the two blocks would necessarily be offset with relation to one another.

With the arrangement of the apertures 24 shown in Fig. 15, the regularity of the end edges is not disturbed, and this arrangement permits reception by the apertures 24 of the tenons along the lower edge of the block of Fig. 1 leaving the edges of the blocks flush.

Two similar arrangements of the transversely extending apertures 25 are also used. The arrangement shown in Fig. 14 is arranged to receive the tenons along the right hand edge of the block of Fig. 1 so as to leave the edges of the two blocks flush as in Fig. 18, and the arrangement shown in Fig. 15, where the mortises 27' of double depth are used, is arranged to receive the tenons along the left hand edge of the block of Fig. 1 leaving the edges of the two blocks flush.

Although it is preferred to utilize a majority of blocks of rectangular shape with larger blocks multiples in area of smaller blocks, blocks of other form may be utilized to increase the construction possibilities. These other blocks may be triangular, round or of any other desired formation. Furthermore certain of the blocks may be formed with apertures 24 to permit the insertion of rods designed to carry wheels, where it is desired to form a wheeled vehicle or the like. Other similar additions may be utilized as desired.

From the above description it may readily be seen that very durable construction blocks have been formed which are at the same time susceptible of interconnection with one another in an endless variety of ways to produce practically any desired structure.

Although only a few forms of the invention have been shown and described, it is obvious that various modifications and changes may be made without departing from the spirit of the invention, and that all such changes are contemplated as may come within the scope of the claims.

What I claim is:

In a set of rectangular toy construction blocks, each block having at least one edge thereof an exact multiple in length of the corresponding edge of the smallest of said blocks and said blocks being of substantially

the same thickness, each block having all
 edges cut to form a series of uniform, sub-
 stantially cubical mortises and tenons of
 equal size on each edge, the mortises and
 5 tenons on one edge being offset from the
 mortises and tenons on the opposite edge to
 render each corner of the block different in
 shape, and the mortises and tenons on the
 several edges being so arranged with respect
 10 to one another that a plurality of the blocks
 may be joined together by means of the mor-
 tises and tenons to form closed box-like struc-
 tures with flush edges with but one arrange-
 ment of mortises and tenons on all blocks of
 15 the same size.

In testimony whereof, I affix my signature.
 REGINALD E. SANDERS.

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