March 31, 1942. L. MAGNUS ET AL 2,278,327

TOY BLOCK

Filed Aug. 27, 1940 3 Sheets-Sheet 1

Fig. 1

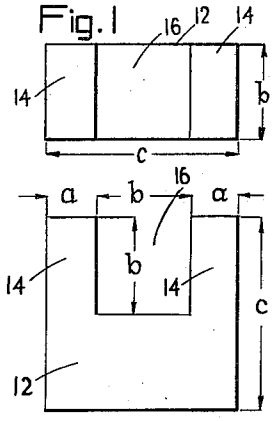


Fig. 2

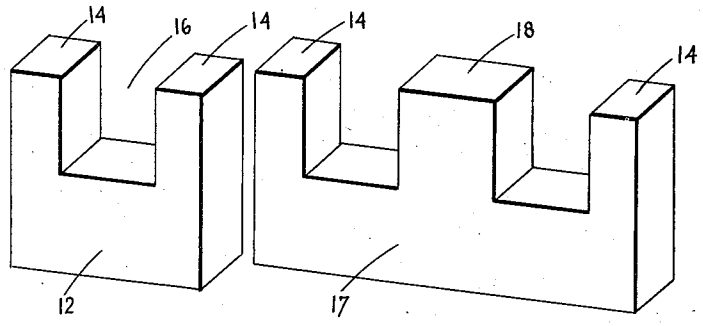


Fig. 3 Fig. 4

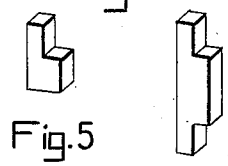


Fig. 5

Fig. 6

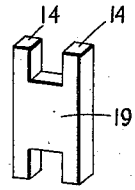


Fig. 7

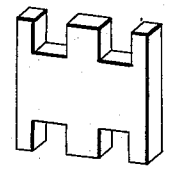


Fig. 8

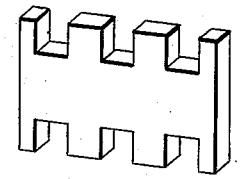


Fig. 9

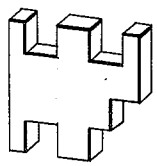


Fig. 10

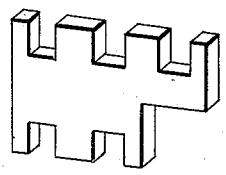


Fig. 11

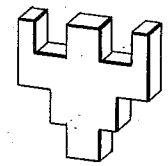


Fig. 12

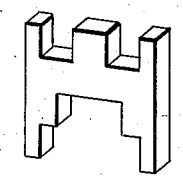


Fig. 13

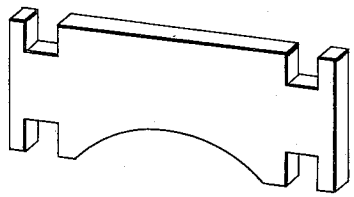


Fig. 14

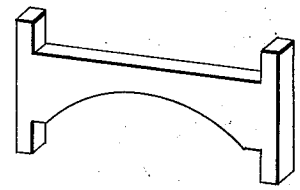


Fig. 15

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Fig. 16

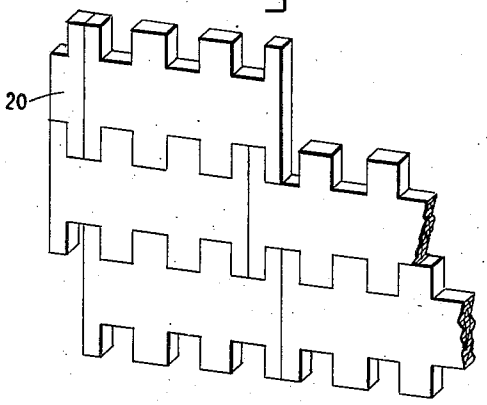


Fig. 17

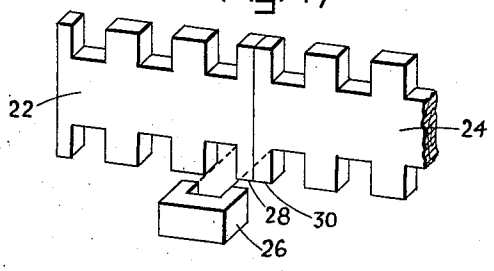
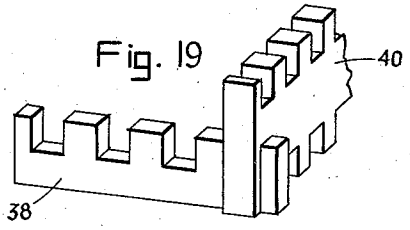


Fig. 19



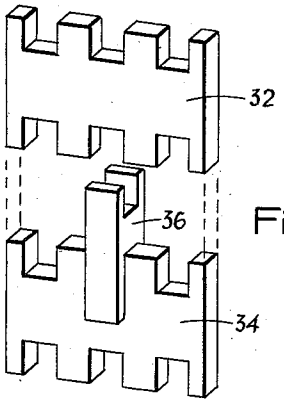


Fig. 18

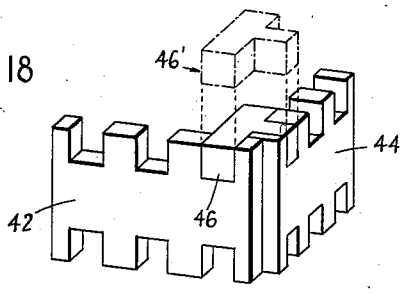
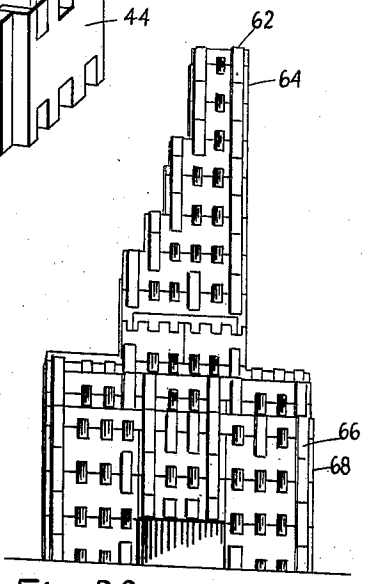


Fig. 20



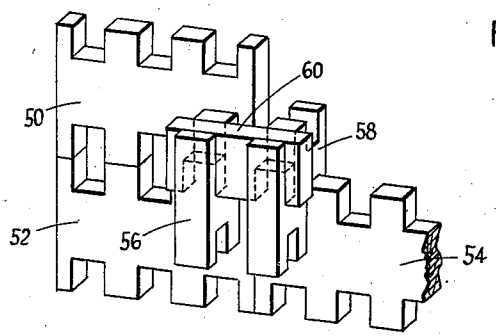


Fig. 21

Fig. 22

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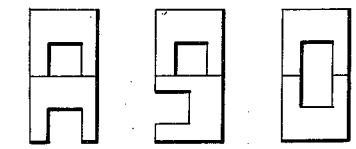


Fig. 29 Fig. 30 Fig. 31

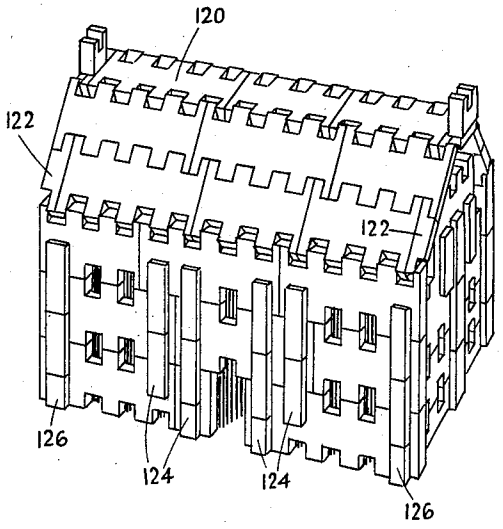


Fig. 24

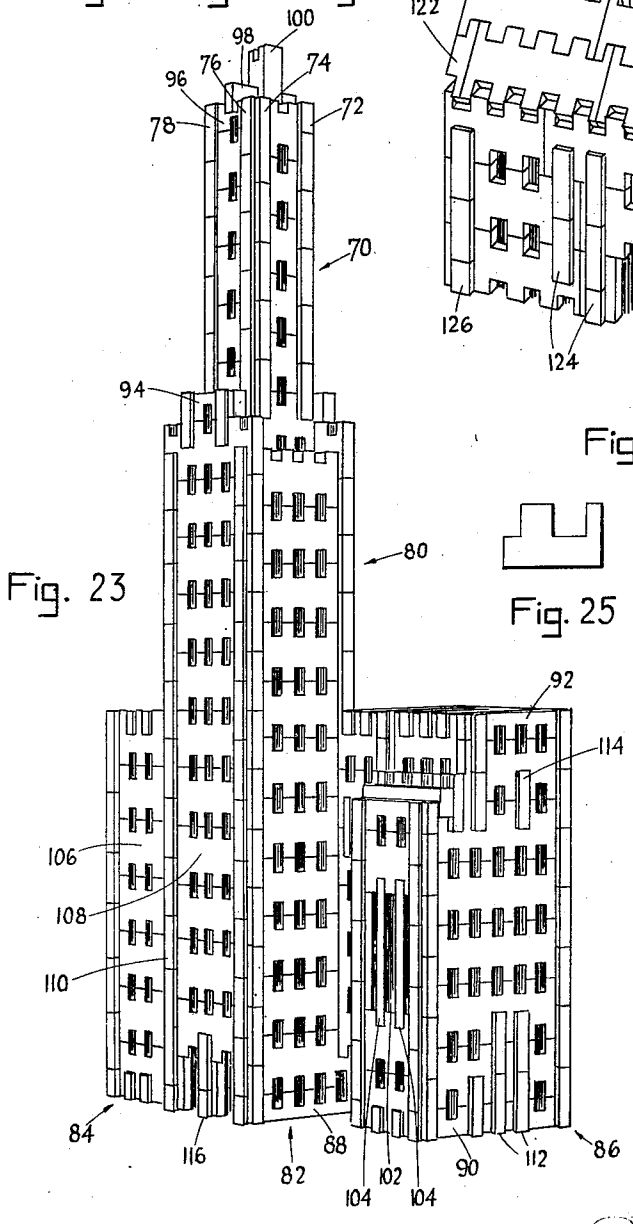


Fig. 23

Fig. 25

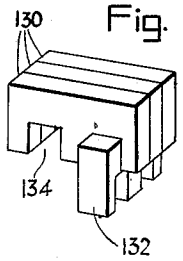


Fig. 26

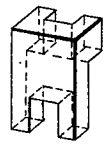


Fig. 27

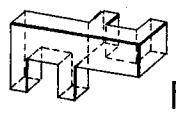


Fig. 28

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Patented Mar. 31, 1942 2,278,327

UNITED STATES PATENT OFFICE

2,278,327

TOY BLOCK

Ludwig Magnus and Berthold Meyerhof, New York, N. Y., assignors of thirty-seven and one-half per cent to David B. Greenberg, New York, N. Y., forty per cent to said Magnus, and twenty-two and one-half per cent to said Meyerhof

Application August 27, 1940, Serial No. 354,368

16 Claims. (Cl. 46—25)

This invention relates to toys and puzzles, and more particularly to interlockable toy blocks.

The primary object of our invention is to generally improve blocks, particularly toy blocks which may be used for structural building purposes, or as a puzzle. It has already been suggested to make blocks with interfitting or interlocking parts, such as mortises and tenons. One object of the present invention is to greatly improve blocks of this general character, and particularly to provide a block of increased versatility and adaptability for the making of a variety of structures. A more specific object is to provide improved blocks which are adapted, among other things, for making simulated buildings, particularly tall buildings or so-called skyscrapers.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, our invention consists in the block elements and their relation one to the other as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a plan view of a basic block or unit of U shape;

Fig. 2 is a front elevation of the same;

Fig. 3 is a perspective view of the same;

Fig. 4 is a perspective view of a multiple U unit;

Fig. 5 is a perspective view of a half U unit;

Fig. 6 is a perspective view of a half H unit;

Fig. 7 is a perspective view of an H unit;

Fig. 8 is a perspective view of a double H unit;

Fig. 9 is a perspective view of another multiple H unit;

Fig. 10 is a perspective view of a block corresponding to three and one-half U units, or to an H unit, and one and one-half U units;

Fig. 11 is a perspective view of a block corresponding to two H and one U units;

Fig. 12 is a perspective view of a block corresponding to two U and two half U units;

Fig. 13 is a perspective view of a block corresponding to two U and two half U units differently arranged;

Fig. 14 is a perspective view of an arch block with mortises and tenons at its ends;

Fig. 15 is a perspective view of an arch block with tenons at its ends;

Fig. 16 is a perspective view illustrating how the blocks may be put together to form a continuous surface;

Fig. 17 is a perspective view showing how blocks may be joined end to end by a U unit;

Fig. 18 is a perspective view illustrating how blocks may be joined in superposition by an H unit;

Fig. 19 is a perspective view showing how a multiple U unit may be interlocked with a multiple H unit;

Fig. 20 is a perspective view showing how multiple H units may be connected by a T connection to form a corner;

Fig. 21 is a perspective view showing how four multiple H units may be joined by two multiple H units and one multiple U unit;

Fig. 22 illustrates one form of simulated toy building which may be made with our improved blocks;

Fig. 23 is a perspective view showing another form of tall building made with our improved blocks;

Fig. 24 illustrates a comparatively low building made with our blocks;

Fig. 25 illustrates a block which may be used as a corner connection block;

Fig. 26 shows another way in which the blocks may be interlocked;

Fig. 27 illustrates one form of block corresponding to U units arranged in perpendicular relation;

Fig. 28 is another block corresponding to U units arranged in perpendicular relation; and

Figs. 29–31 show how the blocks may be assembled to represent letters or numbers.

Referring to the drawings, and more particularly Figs. 1 and 2, the basic block or unit of our invention comprises a single piece of material of approximate U shape. The block is most commonly made of wood, but it may also be made of a molded plastic, ply wood, cardboard, or other suitable material. The block comprises a body 12 having tenons 14 projecting transversely at the ends thereof and forming a mortise 16 therebetween. The mortise 16 has a width half the width of the body 12, and the tenons 14 have a width half the width of the mortise 16. The height of the body 12 is equal to the height of the mortise 16 or/and the tenons 14. The thickness of the block is equal to the width of the mortise. In other words, the mortise space is a cube. Two tenons arranged side by side will equal a mortise space, and will also constitute a cube. In Figs. 1 and 2, the dimension *a* is one-half of the dimension *b*, and the dimension *b* is one-half of the dimension *c*.

The resulting block, which for convenience we

shall term a U unit, is most clearly shown in Fig. 3.

Additional blocks may be made up as multiples of the basic U unit. Thus, in Fig. 4, we show a multiple U unit made up of two U units disposed edge to edge. This may, if desired, be referred to as an E unit. In Fig. 7, we show a block having the configuration of two U units arranged back to back or pointed in opposite direction. This may be referred to as an H unit. It will be understood that in the E unit, the body 17 of the unit has the same height and thickness as in the U unit, but twice the length, whereas in the H unit the body 19 has the same length and thickness, but twice the height of the body in the U unit. In the E unit, the tenon 18 has twice the width of the tenons 14. In the H unit, the tenons are all the same size as in the U unit.

In Fig. 8, we illustrate a multiple block having the configuration of two H units disposed edge to edge. In Fig. 9, the block has the configuration of three H units disposed edge to edge. It will be understood that in Figs. 4, 8, and 9, the mortises have the same dimension as in the basic U unit, and the end tenons have the same dimension as in the basic U unit, whereas the intermediate tenons have twice the width of the end tenons or are cubical in configuration.

The block of Fig. 5 is one-half of a U unit, the U being bisected vertically. The block of Fig. 6 consists of two half U units disposed back to back, or one H unit bisected vertically. These fractional blocks are sometimes valuable for filling an end gap or space caused when assembling a plurality of the other or main blocks.

Special combinations of the H, U, and half units may also be used in making additional blocks. Thus, in Fig. 10 the block there shown corresponds to an H unit, a U unit, and a half U unit or, differently expressed, it corresponds to three and one-half U units. The block of Fig. 11 has a configuration corresponding to two and one half H units, or two H units and a U unit, or five U units. The block shown in Fig. 12 has a configuration corresponding to two units and two half units with the latter arranged edge to edge at the center of the block. The block of Fig. 13 corresponds to two U and two half U units with the latter disposed at the ends of the block.

For the purpose of variety in creating structures utilizing the blocks, it is also possible to provide special blocks simulating particular structural elements such as an arch. Thus, in Fig. 14, the block comprises an arch provided with mortises and tenons at its ends. The height and thickness of the block is preferably made equal to the height of a regular H unit. The mortises and tenons are dimensioned as in the regular blocks.

The arch block shown in Fig. 15 differs primarily in reducing the height of the body intermediate the ends so as to leave only tenons at the ends. Here again, the over-all height and thickness of the block correspond to that of a regular H unit. The tenons correspond to those of a U unit. In both Figs. 14 and 15, the length is so selected as to mate with the regular blocks, that is, the spacing between the tenons corresponds to a suitable desired multiple of the spacing in the U and H units.

Referring now to Fig. 16, it will be seen that the multiple H units may be assembled together or interlocked to form a continuous surface. The staggered relation of the blocks, which manifests itself at the ends, may, if desired, be filled out by the use of appropriate half units such as the half H unit shown at 20.

Fig. 17 illustrates how U, H, multiple U, or multiple H units may be joined end to end by means of a U unit. In the specific case illustrated, two multiple H units 22 and 24 are joined end to end by a single U unit 26, the latter being slid over the adjacent tenons 28 and 30 of the multiple H units.

Fig. 18 illustrates how U, H, multiple U, or multiple H units may be joined in superposition by an H unit. Specifically, in Fig. 18, the multiple H units 32 and 34 are joined in superposition by a single H unit 36. It will be understood that the superposition contemplated in Fig. 18 differs from that contemplated in Fig. 16, in that in Fig. 18 the tenons are brought end to end, the mortise spaces being left open.

Fig. 19 illustrates how multiple units may be interlocked in perpendicular relation. This is particularly useful for interlocking the units at their ends to form the corner of a building. In the specific case shown in Fig. 19, a multiple U unit 38 has been interlocked with a multiple H unit 40. Such an arrangement may be used at the bottom of a building to bring the parts to a common floor level. At successive tiers the multiple H units may be used until the top tier is reached, at which time another multiple unit may be employed to bring the parts to a common roof or set-back level.

If it is of importance, in any particular case, to join multiple units on a common level instead of a staggered level, this may be done by means of a special connection block such as that illustrated in Fig. 20. In this case, two multiple H units 42 and 44 are connected to form a corner by means of connection block 46. The latter is an unsymmetrical T-shaped block having the standard thickness. It is more clearly shown in broken lines at 46', where it is assumed lifted from its connecting position. The cross-bar is square in section and has a length equal to seven times the dimension *a*, or three and one-half times the dimension *b*. The stem is a cube and is located an amount equal to three *a* from one end, and two *a* from the other end. This proportioning of the parts enables it to fit in the relation shown in Fig. 20.

Another block which may be used for the same purpose, that is, for a corner connection is shown in Fig. 25. This block corresponds to a U unit and a half U unit arranged edge to edge.

In Fig. 21, we illustrate how four multiple units may be joined with two double H and a double U or E unit. Specifically, Fig. 4 illustrates the joinder of four multiple H units, but one of these has been omitted to more clearly show the connecting blocks. Thus, there are multiple H units 50 and 52 located in superposition, and two additional multiple H units located in superposition, only the lower one of these being shown at 54. The pairs of superposed multiple H units are located end to end. Multiple H units 50 and 52 are held in superposition by a double H unit 56. Multiple H unit 54 and its superposed multiple H unit are held in superposition by a double H unit 58. The resulting superposed pairs of multiple H units are held in end to end relation by the double U or E unit 60, which is interlocked with the inner or concealed parts of the double H units 56 and 58. A similar result may be obtained by using single H units at 56 and 58, and using one or more U units in horizontal position as shown in Fig. 17.

Fig. 22 illustrates a simulated tall building of set-back construction, constructed with the blocks here illustrated. The illustration assumes the eye level at the bottom of the toy building. The building is made up, for the most part, of multiple H blocks disposed horizontally. The window spaces are formed by the superposed mortises. The ridges 62, 64, 66, 68, etc. at the various corners of the building are formed by the exposed ends of multiple H blocks interlocked in perpendicular relation, as shown in Fig. 19. The entrance has been formed by omitting a block.

Another example of a simulated skyscraper building made by means of our blocks is illustrated in Fig. 23. The tower portion 70 is made up, for the most part, of triple H blocks disposed horizontally. The center mortises form the windows, while the end mortises are used to interlock the blocks in perpendicular relation. The ends of the blocks form the exposed ridges 72, 74, 76, 78. The lower tower portion 80 is formed, for the most part, of horizontally disposed multiple H blocks which are five H's in length. The three center mortises form the three vertical lines of windows, while the end mortises are used to interlock the blocks. When referring to multiple H blocks of a certain length, it will be understood that these may be assembled from blocks of shorter length. Thus a five H block may be made of a two H block and a three H block arranged end to end. This is not important with short lengths, but becomes significant when longer lengths are required.

The lower portion of the building is made up of a number of different wings or sections. The portion 82 is directly beneath the tower 80. The portion 82 is flanked by wings generally designated 84 and 86. The wings are themselves made up of superposed multiple H blocks. At appropriate points, multiple U blocks are used as, for example, at 88 and 90 at the bottom of the building, 92 at the top of wing 86, 94 at the top of tower 80, and 96 at the top of tower 70. The transverse member 98 at the top of tower 70 is also a multiple U block, while the pinnacle 100 is a single H block, the lower end of which straddles the block 98.

For the sake of variety in the window structure, or where it is desired to provide an especially tall cathedral-like window, this may be done by omitting some tiers of blocks and inserting some plain vertical strips, or some multiple U blocks with the tenons turned inwardly where they are out of sight. This is illustrated at 102 where three long vertical window spaces are provided, separated by two vertically disposed strips 104.

Where two walls lie in the same plane as, for example, the walls 106 and 108, they may be joined by superposed H blocks, the exposed edges of which form a ridge such as the ridge 110. Exposed edges of H blocks may similarly be used for ornamentation as well as for utilitarian purposes, this being illustrated at 112, 114, 116, etc.

Of course, the use of the blocks need not be confined to skyscraper structures. In Fig. 24, for example, we illustrate a wholly different character of building made up of our blocks. The roof consists of a ridge 120 made up of a number of multiple H blocks disposed end to end in horizontal position, and sloping surfaces the forward one of which is most clearly shown. This is made up of interlocked multiple H blocks joined as was described in connection with Fig. 16, to form a smooth continuous surface. This is interlocked with the ridge 120 and the vertical walls of the building by inserting the tenons and the mortises at an angle. The use of half H blocks at the ends of the flat surface is illustrated at 122.

The vertical walls are made of three tiers of multiple H blocks, these being joined by other H or multiple H blocks, the exposed ends of which are visible at 124. The end walls begin at the bottom with multiple U blocks, and multiple H blocks are disposed thereabove. The exposed interlocked ends are visible at 126.

It should be understood that the blocks may be interlocked by inserting the body portion of one block into the mortise of another with all of the tenons pointing in the same direction, instead of in opposite direction. Thus, in Fig. 26, three double U blocks 130 are mounted on the body or continuous edge of a double U block 132. There is room for another block like the block 130, thus presenting a square flat top surface. Another block, like the block 132, may be inserted at the mortise line 134, the resulting structure simulating a butcher's chopping block. However, a more common use for continuous blocks presenting a flat surface, as here described, is to form the top or roofing of a building wing, or set-back, or tower.

As so far described, the multiple blocks consist of unit blocks arranged in a common plane. This is not essential. The blocks may be arranged in perpendicular planes, thus forming what may be termed "three dimensional blocks" which are useful for connecting other blocks in perpendicular planes. A vast number of blocks may be designed and made in this way, but we are here illustrating only two typical simple examples. In Fig. 27, the block corresponds to two U units, the upper unit being disposed horizontally, and the lower unit being disposed vertically, with the side of the body of the upper unit common to the top of the body of the lower unit. In Fig. 28, the block corresponds to two U units with the right-hand block arranged horizontally, and the left-hand block arranged vertically. The ends of the body portions of the two blocks are common. It will be understood that words such as "top," "bottom," "right-hand" and "left-hand" are used only for convenience, and that in practice the blocks may be turned to any desired position.

Figs. 29 through 31 illustrate how the blocks heretofore described may be employed in an educational way for the formation of letters or numbers. In Fig. 29, the letter A is simulated by two U units arranged in superposition with the tenons pointing downwardly. In Fig. 31, the letter O, or the number zero, are represented by two U units arranged in superposition with the tenons pointing oppositely. In Fig. 30, the number 9 is represented by two U units, the upper unit having its tenons pointing downwardly and the lower unit having its tenons pointing sidewardly toward the left.

It is believed that the construction and relative proportioning of the parts of our improved blocks, as well as the method of using the same and the many advantages thereof, will be apparent from the foregoing detailed description thereof. The quantitative dimension is unimportant and may vary widely. For example, we have made sets of blocks using wood one-quarter inch in thickness, in which case the tenons have a width of one-eighth inch and one-quarter inch. The mortises have a width of one-quarter inch. The U-shaped unit has a height of one-half inch, and the H-shaped unit a height of one inch. We have also made blocks using wood having a

thickness of three-fourths of an inch, in which case the tenons are three-eighths and three-fourths of an inch in width. The mortises are three-fourths of an inch in width. The U-shaped unit is one and one-half inches in height, and the H-shaped unit is three inches in height. These quantitative dimensions are given by way of example and not in limitation of the invention.

It will also be apparent that while we have shown and described our blocks in preferred forms, many changes and modifications may be made without departing from the spirit of the invention as sought to be defined in the following claims. In some of the claims, reference is made to a block being made of a piece of material, and it will be understood that this is not intended to exclude multiple pieces of material permanently secured together as, for example, the laminations of ply wood.

We claim:

1. A generally U-shaped block element made up of a body portion having two tenons projecting transversely therefrom and forming a mortise therebetween, the mortise having a width half the width of the body and the tenons having a width half the width of the mortise, the height of the body being equal to the height of the mortise or tenons, and the thickness of the body and the thickness of the tenons each being equal to the width of the mortise, and to the height of the body and to the height of the mortise and to the height of the tenons.

2. A block comprising a generally H-shaped unit having the configuration of two U-shaped units arranged back to back, with each of said U-shaped units having the proportions set forth in claim 1.

3. A block comprising a generally H-shaped unit made up of a body portion and four tenons, two projecting upwardly and two downwardly from the body portion, there being a mortise formed between each pair of tenons, the mortise having a width half the width of the body and the tenons having a width half the width of the mortise, the height of the body being double the height of a mortise or tenon, and the thickness of the body being equal to the width of a mortise, and to the height of a mortise and to the height of a tenon, and to one half the height of the body.

4. A block comprising a piece of material having a configuration corresponding to an assembly of a plurality of U-shaped units each having the proportions defined in claim 1.

5. A block comprising a piece of material having a configuration corresponding to an assembly of a plurality of U-shaped units arranged edge to edge and all pointing in the same direction, each of said units having the proportions defined in claim 1.

6. A block made of a piece of material having a configuration corresponding to an assembly of a plurality of H-shaped units arranged edge to edge, each of said H-shaped units having the configuration of two U-shaped units arranged back to back, each of said U-shaped units having the proportions defined in claim 1.

7. A block made of a piece of material having a configuration corresponding to an assembly of a plurality of H-shaped units arranged edge to edge, each of said H-shaped units having the proportions defined in claim 3.

8. A block made of a piece of material having a configuration corresponding to an assembly of a plurality of H and U-shaped units arranged ede to edge, each of said H-shaped units corresponding to two U-shaped units arranged back to back, and all of said U-shaped units having the proportions defined in claim 1.

9. A block made of a piece of material having a configuration corresponding to an assembly of a plurality of U-shaped units, some arranged back to back and some arranged edge to edge, and all having the proportions defined in claim 1.

10. A block made of a piece of material having a configuration corresponding to an assembly of a plurality of complete U-shaped units and fractional or half U-shaped units arranged edge to edge, each of said units having the proportions set forth in claim 1.

11. A block made of a piece of material having a configuration corresponding to one half of a U-shaped unit as defined in claim 1, the U-shaped unit being bisected vertically.

12. A block made of a piece of material having a configuration corresponding to one half of a H-shaped unit as defined in claim 3, the H-shaped unit being bisected vertically.

13. A toy building block of U shape in which each arm has a width a; the thickness of the block, the depth and width of the slot each being b; and each side of the block being c; in which the dimension c is twice the dimension b, and the dimension b is twice the dimension a.

14. A single integral toy building block having the configuration of a plurality of U-shaped units arranged edge to edge, each U-shaped unit being dimensioned as defined in claim 13.

15. A single integral toy building block having the configuration of a plurality of U-shaped units arranged back to back, each U-shaped unit being dimensioned as defined in claim 13.

16. A single integral toy building block having the configuration of a plurality of U-shaped units arranged edge to edge and back to back, each U-shaped unit being dimensioned as defined in claim 13.

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