INTERLOCKING TOY BUILDING PANELS AND BLOCKS BUILT THEREFROM

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Fig. 1.

Fig. 2.

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Attty.
This invention relates to a construction or assembly-type toy having appeal to the inquisitive mind of young and old alike. In particular, the invention provides a number of flat building panels or walls which serve to amuse and educate as they are assembled to form larger objects such as toy blocks and buildings. Each such panel, which may be a brightly colored plastic sheet or the like, carries one of the two tapered halves of a dovetail interlock element on each end. These dovetail elements serve to interlock the panels, one with another in groups of four, to form a four-sided, hollow building block. After a youngster has formed a number of these hollow blocks, the individual blocks can be assembled and interlocked one with another to construct a toy building such as a train depot, service station, or the like. Thus, one object of the invention is to provide two separate and independent interlock or meshing elements for a toy building panel, one such element serving to interlock the panels in the assembly of a toy building block and the other serving to interlock a group of such blocks in the construction of a toy house, building or the like.

The propensity of preschool and school-age children alike to be fascinated and amused by a building or construction-type toy is well known. Thus, parents often give such toys to their children in order to watch the child experiment and play at the construction of a toy block and/or toy building. Further, these parents realize that construction-type toys instruct and educate the child in the intricacies of a mechanical assembly, and they keep the child amused and silent while the parent is busy with other tasks. To the end that such a toy may appeal to a wide age group, it is necessary that a number of factors be kept in mind. Firstly, children of preschool age admire and brightly colored mechanical toys, the assembly or construction of which is not difficult for the young minds to grasp. Additionally, the various parts or elements of the toy should be nontoxic and both the assembled toy building and the parts thereof should be light in weight, rugged and flexible in order to withstand hard usage from pounding, chewing, and throwing about of the toy. Secondly, somewhat older children demand a toy requiring an increased or more advanced skill to assemble and a life-like or natural appearance when assembled into a building or the like. Having in mind these diverse factors, it is a primary object of my invention to provide a construction-type toy, educational in nature, which will amuse and entertain a large number of children in diverse age groups by satisfying the above listed requirements.

To this end, I have provided the aforementioned building panels or walls with two independent interlocking elements. The first such interlocking element includes a complementary dovetail tenon and recess used in the assembly of a cube-like or rectangular solid block from the individual panels. These dovetail elements purposely are tapered at right angles one to another whereby assembly of blocks requires a certain amount of skill, thus serving an older group of children. Further, the dovetail elements, when interlocked in companion pairs, provide a sturdy, rugged building block well adapted to resist hard usage and play. On the other hand, the second interlocking element includes a pin and fork structure for securing companion ones of said blocks one to another. This pin and fork structure requires a lesser degree of skill in assembly. Thus, a young child or toddler can be amused and kept interested if the parent will assemble a number of the small building blocks and allow the child to play with and to assemble these blocks one with another. Further in this vein, my invention provides a lightweight panel which is formed from a tough, brightly colored plastic or the like, yet which, by means of a novel rib structure, is reinforced completely along those portions which are subject to the most stress and strain. Thus, whatever the age group, both the individual panels and the assembled blocks efficiently will withstand hard usage. Yet further, the individual building blocks, when assembled into a complete building such as a service station, airplane hangar, or the like, present an appearance not unlike the appearance of full-size building blocks in a full-size structure. This appearance adds to the amusement of both preschool and school-age children.

These and other objects and advantages of my invention hereinafter will be set forth in the following detailed description, taken with
reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a toy service station built with toy building blocks assembled in accord with this invention; and

Fig. 2 is a detail view, showing a number of individual toy building panels in various stages of joiner and spaced vertically one from another to better indicate the manner in which both the panels and the blocks may be interlocked by independent interlocking elements. In the drawings, a number of individual building panels joined in various stages of assembly. These panels are best formed from a thermoplastic, such as Polystyrene, by injection molding. However, whether the panels are molded from plastic, pressed from metal, or otherwise formed, each panel should have a parallelogram shape akin to either the rectanglar side units 1 or the square end units 2 of Fig. 2. Aside from the shown differences in length, however, each of the panels 1 and 2 is identical.

Accordingly, I employ the term right angular “parallelogram” as generic to either of the panels shown or to an equivalent thereof.

Each of the building panels 1 and 2 is provided with a thin, flat wall 3 bounded between a top margin 4, a bottom margin 5, and two end margins 6 and 7, respectively. A flat surfaced rib 8 projects laterally in from the wall 3 and extends completely around the aforementioned peripheral margins. This rib is of uniform depth and is disposed perpendicular to the wall 3 along the top and bottom margins 4 and 5 respectively. At the ends of the panel, the rib is formed into interlocking elements hereinafter to be described. Thus, as best shown in the middle and lower portions of Fig. 2, the rib 8 causes these elements to define an interlocking chain stitch along the corner between each pair of assembled panels.

To lock the individual panels 1 and 2 together when forming a building block, each of the end margins 5 and 7 carry one of the two complementary, tapered halves of a dovetail interlocking means. Thus, the right end margin 7 carries a plurality of dovetail tenons 9. These dovetail tenons project longitudinally from the end margin 7 and the individual tenons are bounded between a flat end face 10 (perpendicular to the wall 3) and two oblique side faces 11 (see the middle portion of Fig. 2). In a similar manner, the left end margin 6 carries a plurality of dovetail recesses 12. Each of the dovetail recesses 12 is complementary to a corresponding one of the dovetail tenons 9. However, this complementary disposition is at right angles, rather than end to end, for a purpose hereinafter to be discerned. Thus, each dovetail recess includes two oblique side faces 13 and an inner end face 14 lying normal to the aforementioned wall 3, and it is a recess side face 11 which contacts each tenon side face 11.

In assembly of the panels to form a hollow toy building block, four panels are used for each block. Thus, a rectangular solid may be formed by using two side panels 1 and two end panels 2 (see the bottom of Fig. 2), a small cube may be formed by using four end panels 2, or a large cube may be formed by using four side panels 1. The optional building block size adds to the amusement value of the toy. The steps of assembly are identical whichever block size is chosen. Accordingly, a typical assembly operation will be described with reference to the four panels A, B, C, and D shown at the bottom of Fig. 2. As previously mentioned, each of the dovetail tenons 9 is formed with the flat end face 10 and the oblique side faces 11 perpendicular to the wall 3 whereas each of the dovetail recesses 12 is formed with the side faces 13 disposed at an oblique angle to this wall. Accordingly, the panel A is grasped in the left hand and the panel B in the right hand with the complementary tenons and recesses disposed at right angles to one another. This is for the reason that the tenons and recesses will not fit end to end but must be turned at right angles. Thereafter, the tenons 9 (on the panel A) are fitted into the recesses 12 (on the panel B) by sliding the end of the panel A laterally sideways against the end of the panel B. The panels C and D then are assembled in like manner. After these first steps of assembly, two L-shaped structures will result (see the middle L shape in Fig. 2). Thereafter, the two L's are fitted together, again by arranging the panels A and B perpendicular to the panels C and D (in the shape of a block) and slipping the corresponding tenons into the complementary recesses at right angles. As best shown at the bottom of Fig. 2, a building block assembled in this manner will resist detachment or disassembly by virtue of the right angle interlock of each tenon and recess. Thus, the tenons 9 on the left end of the panel C resist and prevent movement of the panel longitudinally of the tenons. In like manner, the tenons on each of the other panels A, B, and D prevent movement longitudinally of their corresponding tenons. After the building blocks have served their purpose, however, detachment or disassembly is accommodated because the right angular joiner of the tenons and recesses accommodates movement longitudinally of the recesses. For example, the corner between the panels C and D can be disassembled by moving the tenons on the panel C laterally away from the recesses in the panel D. Thus, each of the dovetail recesses accommodates movement in a longitudinal direction whereas each of the dovetail tenons prevents movement in a direction of right angles thereto.

Turning now to Fig. 1, I have shown a service station as one example of a toy building which may be assembled from the building blocks previously described. In assembling this service station, a number of building blocks have been stacked vertically, one upon another. In order that the vertical stacks of blocks adequately may resist lateral displacement relative one to another, I have provided a novel pin and fork structure now to be described. To this end, an upstanding pin 15 is carried upon that portion of the flat rib 8 which extends along the top margin 4 of each panel. This pin 15 is parallel to the wall 3 and is disposed at a point intermediate the ends of the panel. Similarly, a two-pronged fork 16 protrudes laterally from intermediate the ends of that portion of the rib 8 bounding the bottom margin 5. The prongs of each fork 16 are spaced longitudinally by a distance substantially equal to the thickness of a corresponding pin 15 in order that the two prongs may straddle the pin. Thus, when the building block assembled from the panels A, B, C, and D is complete, four pins 15 protrude upwardly from the hollow inferior of the block and four complementary two-pronged forks laterally into the inferior of the block adjacent the lower face thereof. This complementary lateral spacing of the pins and forks prevents displacement of one building block
relative to another in each of four separate directions.

As shown in Fig. 1, I have provided a number of elements supplementary to a group of my building blocks. Thus, any of numerous structures such as a house, airplane hangar, toy railroad station, or the like, may be assembled for playing with other toys commonly used by children. In the service station, shown as explanatory, a flat piece of cardboard 17 is provided for a base. This cardboard base has appropriate cutaway portions in which the vertical stacks of toy building blocks may rest. Thus, an elongated front cutaway portion 16 accommodates both the two end pillars or stacks of building blocks 18 and a pump island (formed from a rectangular piece of wood) such as is shown at 20. To lend realism, two miniature gas pumps 21, a clear plastic window 22, and a plastic door 23 may be added. Further, elongated wood girders (not shown) may be laid over the assembled building blocks and a cardboard roof 24 placed thereupon. Whatever the supplementary items employed, however, it is evident that the toy building is assembled either by stacking two or more hollow building blocks one upon the other or by latching two or more building blocks horizontally face to face so the pins and forks mesh. Thus, the completed structure will have a natural, life-like appearance and efficiently will resist lateral movement and displacement such as may result from hard usage or play.

As will now be apparent, my construction-type toy possesses appeal for a wide age group of children. For example, the assembly of the dovetail elements of the various panels A, B, C, and D sometimes may prove to be too complex an operation for the mind of a very young child readily to grasp. However, the assembly of one block with another, by means of the pins 15 and forks 16, is relatively simple. Accordingly, very young children will find amusement in assembling building blocks of various sizes and shapes into long rows, tall stacks, or other shapes and forms. With somewhat older children, however, amusement will be provided in the assembly of the individual panels to form completed building blocks. Thereafter, the completed building blocks may be assembled into a building such as the service station shown. It is to serve this wide age group that I have provided two separate and independent interlocking or meshing elements for a toy building panel. One such element serves to interlock the panels to form a building block whereas the other serves to interlock a group of such blocks in the construction of a toy building. I have thus served my primary inventive object which is to provide a construction-type toy which is educational in nature and which will serve the requirements of a large number of children in diverse age brackets.

I claim:

1. In a toy structure, a plurality of plastic building blocks adapted to be stacked in vertical alignment one upon another, each said block having a hollow interior opening at the top and bottom, said open tops and bottoms being adapted to be arranged in vertical registration, complementary pin and fork means on said block adapted to secure said blocks against lateral displacement relative to one another when in vertical juxtaposition, said means including a plurality of pins spaced laterally about the hollow interior of the top rib of each said block and protrudable vertically into engagement with a like plurality of complementary forks spaced laterally about the hollow interior of the bottom rib of another said block stacked thereon, such fork being arranged to straddle one of said pins, the hollow interior of each said building block being bounded by four panels having abutting complementary ends arranged at right angles one with another, and dovetail means for detachably interlocking said abutting ends, said dovetail means including an elongated dovetail tenon carried at one end of each panel and a complementary elongated dovetail recess carried at the opposite end, complementary ones of said tenons and recesses being carried at a point intermediate said end margins of the tenon carried thereby but to accommodate said dovetailed movement longitudinally of the recess carried thereby.

2. In a toy structure including a plurality of plastic toy building blocks, said blocks being interlocked one with another to prevent relative displacement between the individual blocks, such building blocks each having interlocking end and side panels detachably joined one with another, each such panel comprising; an elongated, right angular parallelogram having a thin, flat wall bounded between a top, bottom, and two end peripheral margins, a flat rib of uniform depth projecting laterally in from said flat wall and extending completely about said peripheral margin, a dovetail tenon formed in that portion of said rib bounding one end margin of said panel and projecting longitudinally from said one end margin, a dovetail recess complementary to said dovetail tenon and formed in that portion of said rib bounding the opposite end margin of said panel, an upstanding pin protruding beyond the plane of that portion of said flat rib bounding said top margin, said pin lying parallel to said wall and being carried at a point intermediate said end margins, and a fork complementary to said upstanding pin and protruding laterally in from intermediate the ends of that rib portion bounding said bottom margin and lying in the plane of said rib portion.

3. A plastic panel for use in the assembly of a toy building block, comprising an elongated right angular parallelogram having a thin wall bounded between a top, bottom, and two end peripheral margins, a flat surfaced rib of uniform depth projecting laterally in from said wall and extending completely about said peripheral margin, said rib and wall being normal along said top and bottom margins, a plurality of dovetail tenons formed in that portion of said rib bounding one end margin of said panel and projecting longitudinally from said one end margin, each said dovetail tenon having a flat end face and two oblique side faces all lying normal to said wall, a plurality of dovetail recesses complementary to companion ones of said dovetail tenons and formed in that portion of said rib bounding the opposite end margin of said panel, each said dovetail recess having two oblique side faces bounding a lateral taper and having an inner end face lying normal to said wall, an upstanding pin protruding beyond the plane of that portion of said flat rib bounding said top margin, said pin lying parallel to said wall and being carried at a point intermediate said end margins, and a fork complementary to said upstanding pin and protruding
laterally in from intermediate the ends of that rib portion bounding said bottom margin and lying in the plane of said rib portion, said fork having two prongs spaced longitudinally a distance substantially equal to the thickness of said pin.

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