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TOY BUILDING SET WITH INTERFITTING FRAMES AND BLOCKS

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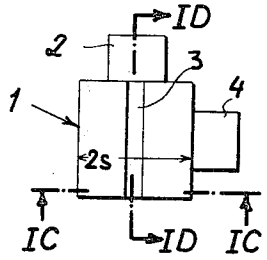


Fig. 1a

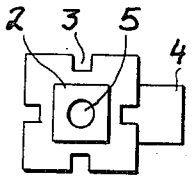


Fig. 1b

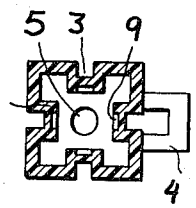


Fig. 1c

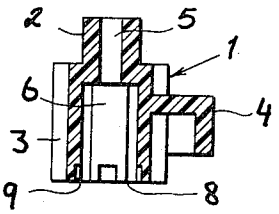


Fig. 1d

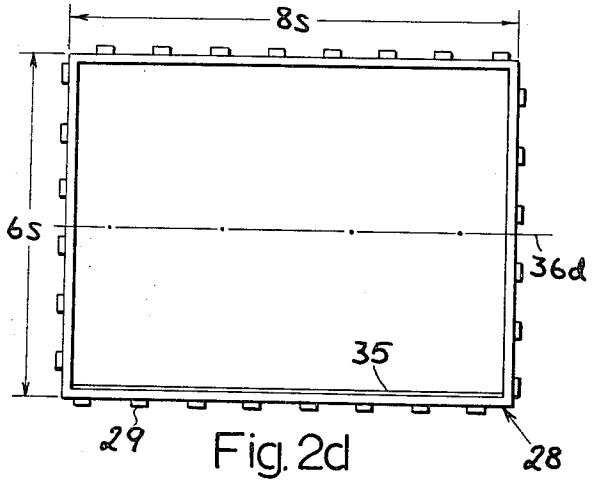


Fig. 2d

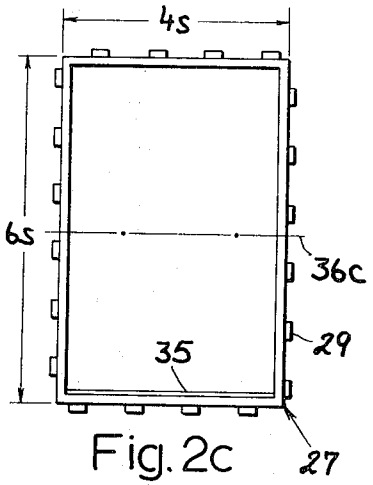


Fig. 2c

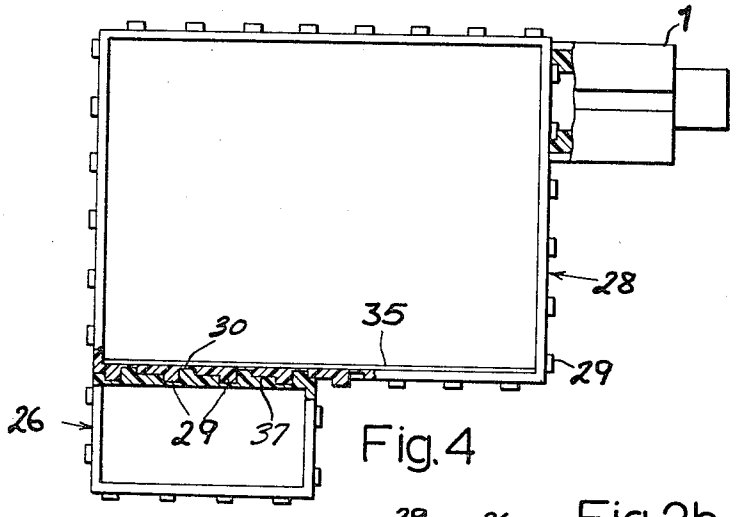


Fig. 4

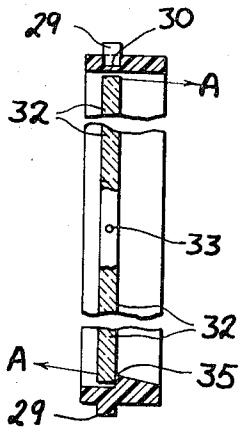


Fig. 3

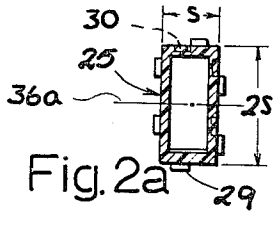


Fig. 2a

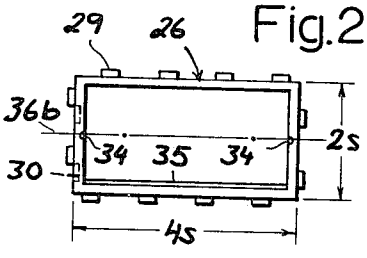


Fig. 2b

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TOY BUILDING SET WITH INTERFITTING FRAMES AND BLOCKS

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Continuation-in-part of application Ser. No. 383,597, July 20, 1964. This application Dec. 5, 1968, Ser. No. 781,390

Int. Cl. A63h *33/08*

U.S. Cl. 46—16 9 Claims

ABSTRACT OF THE DISCLOSURE

Toy building set with several rectangular frame elements of different sizes, all their sides except possibly the minor side of the smallest rectangle being equal to or a multiple of predetermined unit length corresponding to the length of the sides of a multiplicity of prismatic building blocks of square outline also included in the set; the rectangles and building blocks are formed with complementary projections and depressions enabling their selective interfitting. Specially colored or otherwise distinctive panels may be swingably lodged in the rectangles to simulate window panes and the like.

This application is a continuation-in-part of my copending application Ser. No. 383,597 filed July 20, 1964, now Patent No. 3,415,007.

In that copending application and patent I have disclosed a toy building set wtih a multiplicity of prismatic, generally cubic blocks serving as basic construction elements, these blocks as well as several types of associated auxiliary elements being formed with mating formations to enable their selective interfitting. More particularly, the blocks may be formed with male coupling formations or plugs on one or more sides and with complementary sockets on at least one other side; other such formations include lateral grooves, designed to receive ribbed cover plates, and inner recesses forming lateral extensions of the socket on the last-mentioned side.

With the object of increasing the diversity of the structures capable of being constructed with such a toy set, my prior application and patent also disclose a set of rectangular frames of staggered sizes to be used as auxiliary construction elements. My present invention relates particularly to these frames and their mode of interconnection with one another and with the basic building blocks of the set.

In accordance with an important feature of this invention, the aforementioned rectangular frames are so dimensioned that the sides of each rectangle are equal to or a whole multiple of a given unit length *s* corresponding to all or an aliquot fraction (e.g. half) of the length of a side of the basic block, the length of each frame side being thus equal to $n \cdot s$ where n is an integer. In a preferred embodiment, giving the widest choice of building dimensions obtainable through selective combinations of differently size frames. the rectangles are so staggered that the major side of any smaller frame equals the minor side of the next-larger frame, the major and minor sides of each frame differing by the length of a block side with the possible exception of the smallest-size frame whose major side may have a length 2*s* corresponding to that block side, its minor side having the unit length *s*.

According to another advantageous feature, the outer surfaces of the frames are substantially uniformly studed with coupling formations alternating with complementary female formations; though the latter could be throughgoing holes or sltos, it will usually suffice to shape them as blind holes or depressions so as not unduly to weaken the walls of the frames. The male formations may

be ribs or bosses of round, square or rectangular profile, their spacing being advantageously so chosen that any two adjoining projections may jointly fit into a cutout of a building lock, e.g. one of the lateral grooves or the laterally recessed socket thereof referred to above.

According to another feature of my invention, special rectangular panels may be pivotally or otherwise mountable in one or more of the frames to stimulate, say, windows or doors. These panels may be transparent or distinctively colored to enhance that impression.

The invention will be described in greater detail with reference to the accompanying drawing in which:

FIG. 1*a* is a side-elevational view of a basic building block of a toy set according to the invention;

FIG. 1*b* is a top view thereof;

FIG. 1*c* is a cross-sectional view taken on the line IC—IC of FIG. 1*a*;

FIG. 1*d* is a sectional elevation taken on the line ID—ID of FIG. 1*a*;

FIGS. 2*a*, 2*b*, 2*c*, 2*d* are face views (the first one in section) of successively smaller frames in a set of staggered frames according to the invention;

FIG. 3 is a fragmentary cross-sectional view of one of these frames provided with a swingable panel; and

FIG. 4 is a plan view of a combination of a variety of interfitted elements of the type shown in the preceding figures.

In FIGS. 1*a*, 1*b*, 1*c*, 1*d* I have shown a block **1** having a prismatic, specifically cubic body whose sides have a length 2*s*, *s* being a unit length significant for the dimensioning of a set of associated frames **25**, **26**, **27** and **28** respectively illustrated in FIGS. 2*a*, 2*b*. 2*c*, 2*d*. Thus, the smallest frame **25** has a minor side of length *s* and a major side of length 2*s*; the next frame **26** has a minor side of length 2*s* and a major side of length 4*s*; the third frame **27** has a minor side of length 4*s* and a major side of length 6*s*; and the largest frame **28** has a minor side of length 6*s* and a major side of length 8*s*. All the frames as well as the blocks **1** of the set are advantageously made of a synthetic resin having sufficient resiliency to facilitate the releasable interfitting of their mating formations which include one or more square-profiled plugs **2**, **4** on upper and/or lateral faces of blocks **1**, complementary sockets **6** on the undersides thereof, lateral median grooves **3** of a width corresponding to the diameter of a center bore **5** of plug **2**, and symmetrically disposed recesses **9** formed at the bottom **8** of socket **6** in internal ribs **7** whose presence gives sufficient wall thickness to the body of the block in the region of the grooves **3**. On the frames **25–28** the coupling formations are outwardly pointing bosses **29** and depressions **30** alternating therewith along the length of a frame side, both the projections **29** and the depressions **30** being equispaced along the frame sides though any depression flanked by two projections is shown to lie closer to one of these projections than the other. The bosses **29** may be of square profile, complementary to that of the recesses **9** in FIGS. 1*c* and 1*d*, and so spaced apart that the bottom cutout **8** of any block **1** may be fitted thereto as illustrated in FIG. 4. This figure also shows how two or more frames, specifically frames **25** and **28**, can be interfitted by their male and female coupling formations **29**, **30**.

It will be seen that any pair of closely adjoining formations **29**, **30** on, say, frame **25** is relatively widely separated from the next such pair by a land **37**, level with the outer frame edge, which comes to rest against a similar land on the adjoining frame (e.g. **26**) whose projections and depressions mate with the complementary formations on the first frame. It will further be noted that the first formation on a frame side, nearest one corner, is of one type (e.g. a depression **30**) while the last for-

mation on that side, nearest the opposite corner, is of the other type (e.g. a projection **29**). This arrangement allows the fitting of a larger number of coupling formations on a frame of given size (and therefore the choice of a smaller unit length *s*) than would be possible if the bosses **29** and depressions **30** were uniformly spaced from one another.

Each frame **25–28**, or some of them, may be provided with mounting formations **34**, i.e. a pair of aligned notches in opposite frame sides, defining a more or less median axis designated **36***a*, **36***b*, **36***c*, **36***d* in FIGS. 2*a*, 2*b*, 2*c* and 2*d*, respectively. These notches are designed to receive pins **33**, FIG. 3, on a rectangular panel **32** fitting the respective frame whereby the latter may swing about the corresponding pivotal axis in the manner of a door or window. Such swinging (arows A) may be limited by an abutment **35** in the form of a ledge along an inner frame edge parallel to the swing axis. Panel **32** may consist of glass, plastic material, metal or any other sufficiently rigid material and may be specifically colored or otherwise of distinctive appearance compared with the associated frame.

It will be apparent that the blocks **1** may also be fitted with their grooves **3** onto the studs **29** and that, if desired, other mating formations can be provided on these blocks for that purpose.

I claim:

1. In a building set, in combination, a plurality of rectangular frames of different sizes, the side of each rectangle being equal to *n.s* where *n* is a whole number and *s* is a predetermined unit length, said frames being externally provided with complementary male and female formations enabling their selective interfitting, said male formations being outwardly directed projections and said female formations being inwardly directed depressions, said projections and depressions alternating along a frame side and being grouped into *n* pairs of closely adjoining complementary formations separated along said frame side by intervening lands level with the outer frame surface, the separation of said pairs by said lands substantially exceeding the relative spacing of said adjoining complementary formations, the first formation at one end and the last formation at the opposite end of said frame side being of complementary types.

2. The combination defined in claim **1** wherein each of said rectangles has a major side equal to the minor side of the next-larger frame.

3. The combination defined in claim **1**, further including a multiplicity of identical, matingly interconnectable, generally prismatic blocks, said unit length *s* bearing an aliquot relationship with the length of a side of any of said blocks, the latter having surface recesses adapted to receive said projections for selective attachment to said frames.

4. The combination defined in claim **3** wherein the outline of said blocks is a square of side **2***s* and the minor side of the smallest frame is equal to *s*, the major side of said smallest frame being equal to **2***s* and the major side of each larger frame differing by **2***s* from the corresponding minor side.

5. The combination defined in claim **3** wherein at least one side of each frame is provided with at least a pair of said male formations in longitudinally spaced relationship, said blocks having faces provided with elongate cutouts engageable by said pair of projections.

6. The combination defined in claim **1**, further including at least one rectangular panel, at least one of said frames having substantially the dimensions of said panel and being provided with mounting formations for receiving said panel in its interior.

7. The combination defined in claim **6** wherein said panel is provided with a pair of aligned lateral pins, said mounting formations being a pair of aligned notches spaced and positioned to receive said pins for pivotally engaging said panel.

8. The combination defined in claim **7** wherein said one of said frames is provided with an internal ledge along a side parallel to the line of said notches forming an abutment for said panel.

9. The combination defined in claim **8** wherein said ledge extends along a side of said one of said frames, said notches being disposed substantially midway on two sides transverse thereto.

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U.S. Cl. X.R.

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