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[54] TOY BRICK AND COMBINATION OF TOY BRICKS

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[52] **U.S. Cl.**.. **46/25,** 46/26
[51] **Int. Cl.**.. **A63h 33/08**
[58] **Field of Search**............................ 46/24, 25, 26

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Assistant Examiner—Robert F. Cutting
Attorney, Agent, or Firm—Walter Becker

[57] ABSTRACT

The toy brick comprises a box-shaped part with side and end walls and with a top wall while being open at the bottom and having a plurality of elastically deformable holding means, fins or connecting elements connected to the outside of the top wall in a symmetrically paired arrangement for frictional engagement with some of the walls or some of the holding means of another toy brick of similar construction.

12 Claims, 14 Drawing Figures

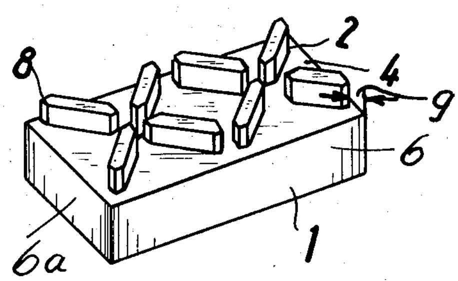


Fig.1

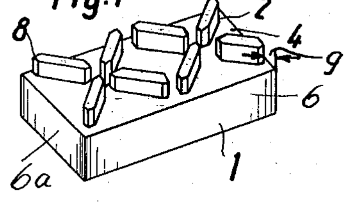


Fig.2

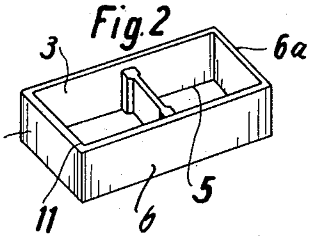


Fig.3

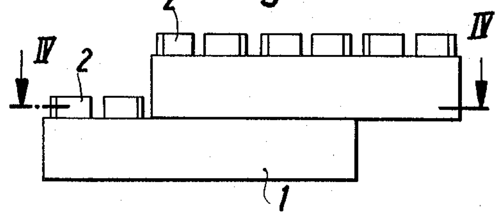


Fig.5

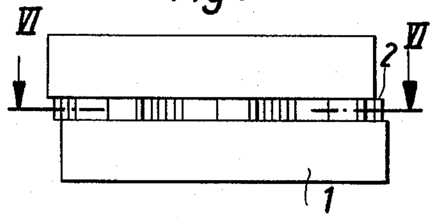


Fig.4

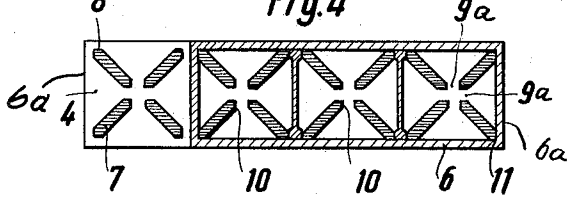


Fig.6

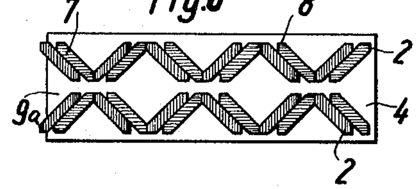


Fig. 7a

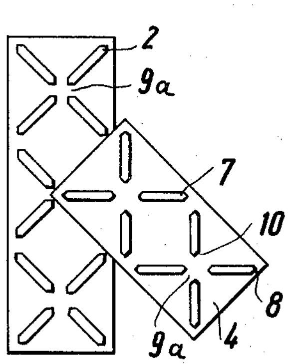


Fig. 7b

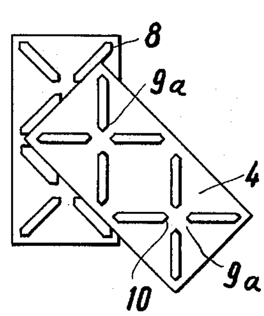


Fig 7c

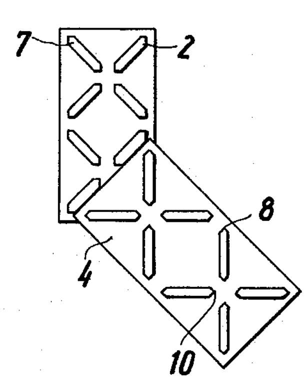


Fig.8

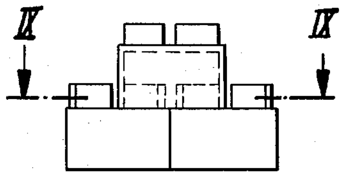


Fig.10

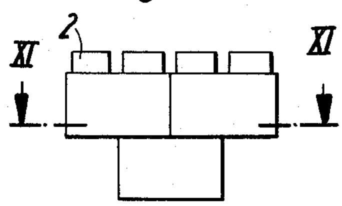


Fig.9

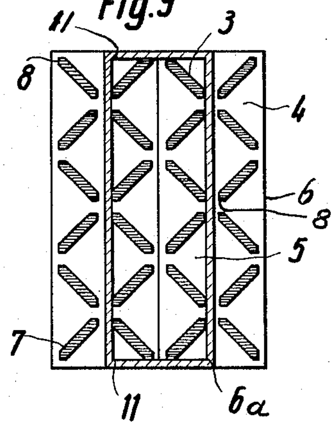


Fig.11

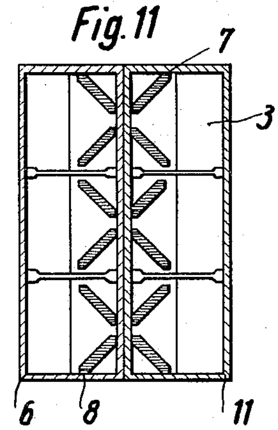
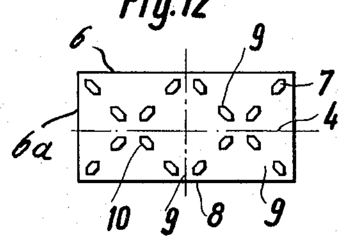


Fig.12



TOY BRICK AND COMBINATION OF TOY BRICKS

Toy bricks are known which comprise a hollow base having walls defining a box having an open bottom and being surmounted by a configuration which is insertable with a friction fit into the hollow base of another toy brick.

Such bricks can be fitted together only in a limited number of combinations. For example, they cannot be fitted together at an angle of 45°. Moreover, it is impossible to join the superstructures of two bricks together in a friction fit. Hence the number of possible constructions is very limited.

It is, therefore, an object of the present invention to provide a toy brick that can be used in a multitude of different ways and that can be frictionally fitted together with other toy bricks in a great diversity of combinations.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is an isometric view of a toy brick according to the invention showing the top and two sides of the brick.

FIG. 2 is an isometric view of the same brick of FIG. 1, but showing the bottom and all four sides of the brick.

FIG. 3 is a side elevation of two toy bricks fitted together.

FIG. 4 is a section on the line IV — IV of FIG. 3.

FIG. 5 is a side elevation of two toy bricks shown with their superstructures fitted together.

FIG. 6 is a section taken along the line VI — VI of FIG. 5.

FIGS. 7*a*, 7*b*, 7*c* respectively illustrate three possible ways of interfitting toy bricks at an angle of 45°.

FIG. 8 is a side elevation of three toy bricks fitted together.

FIG. 9 is a section along the line IX — IX of FIG. 8.

FIG. 10 is a side elevation of three differently interfitted bricks.

FIG. 11 is a section along the line XI — XI of FIG. 10.

FIG. 12 is a view from above of a brick formed with repeatedly gapped fins.

The toy brick according to the invention is characterized primarily by a superstructure consisting of a plurality of narrow, symmetrically paired and elastically flexibly deformable holding means or connecting elements which can be optionally frictionally fixed together with the holding means or connecting elements of another brick as well as with its box walls.

The proposed toy bricks can be joined together at angles of 45°. Moreover, their superstructures also interfit. This permits attractive variations to be introduced into the construction of a building from a number of toy bricks.

In a preferred embodiment of the invention the connecting elements holding means or have the form of fins. These readily yield when several toy bricks are fitted together and they create a firm friction joint.

The brick according to the invention substantially consists of a base **1** surmounted by a superstructure **2**. In shape the base **1** is an oblong box with an open bottom **3**. The top **4** of the box carries the superstructure **2**. The hollow interior **5** of the box is surrounded by side walls **6** and end walls **6*a***.

The superstructure **2** consists of holding means or fins **7** which extend diagonally across the top **4** with their ends **8** near the sides **6**. Their ends facing the corners of the base **1** may be V-shaped and thus pointed. Moreover, they may end short of the outside surface of the wall **6** to leave a space **9** between the ends and the outside surface at the sides of the brick equal to the thickness of the wall **6**.

Near the center of the top **4** of the base the fins are gapped. The result is the creation of holding means or fins **7** having four inside ends **10** which face each other leaving a gap **9*a*** between them.

When two such bricks are fitted together the box-shaped base **1** can be fitted over the superstructure **2** so that the ends **8** are received into the corners **11** of the interior **5** (FIGS. **3**, **4**). However, one brick may also be used to connect together two other bricks by inserting the walls **6** of two bricks between the facing inside ends **10** of the holding means or fins **7** (FIGS. **8**, 9). In both cases the ends **8** make frictional contact with the base **1** on a line which is as long as the holding means or fins **7** are high. According to the manner in which the bricks are fitted together, either the corners **11** or the centers of the inside walls **6** will frictionally cooperate with the ends **8**, **10**. Owing to the elastic flexibility of the holding means or fins **7** which have a small base with which they are attached to the top **4** of the base, the fins are capable of adapting themselves to any irregularity in the corners **11** or on the inside walls **6**. Consequently, the holding means or fins **7** will apply a uniform amount of pressure to the walls **6** and thus provide a good friction fit.

The frictional interfitting of such bricks does not depend upon the contour of the base. It is merely necessary for the superstructure **2** to match the contour. For example, instead of the square cross section shown in the drawings, round, oval and rectangular contours could also be chosen.

The configuration of the superstructure **2** could also be varied in any desired way, provided the elements of the superstructure are elastically flexible. For instance the holding means or fins **7** could be repeatedly gapped, the gap width in each instance being equal to **9** (FIG. **12**). A sinusoidal configuration of the superstructure **2** would also be feasible. In principle three fins would be sufficient for frictionally fitting two bricks together, the ends **8** of two fins ending in the corners **11** and the end **8** of the third ending either nearly in the middle of wall **6** which does not adjoin either of the corners **11** or in a third corner **11**. A firm connection which would not allow relative rotation between the two bricks would still be assured.

The disposition of the holding means or fins **7** on the top **4** of the base may also be varied. For instance four fins **7** could be arranged to extend from the middle of one side wall **6** to the middle of the adjoining wall **6** (FIGS. **9**, **11**). The height of the fins **7** will more or less depend upon the nature of the material of which they are made. Generally speaking a soft synthetic plastics of which toy bricks are commonly made will be preferred. In such a case the height of the fins may be about one-third of the height of the base **1**. If the choice of alternative materials results in a change in friction between different components, then the height of the fins may accordingly be increased or reduced.

The arrangement of the fins **7** is always such that the configurations of the superstructure **2** of two different bricks can be fitted together 9FIGS. 5, 6). (FIGS. compensating flanks of two fins make frictional contact. An open longitudinal joint will remain between the bases 1 of bricks thus joined, the width of the joint being equal to the height of the fins 7. The presence of this open joint introduces an aesthetic variant into the construction of a building from bricks according to the invention.

Moreover, it is also possible to use only some of the fins for fitting two bricks together. FIG. 7 shows how one brick can be fitted to another brick at an angle of 45°. The obliquely fitted brick in the first case is held on the inside of the box by the flanks and on the outside of the box by the points of two fins 7 each. In the second case the superimposed brick is located by the flanks of four fins. Two pairs of two fins at an angle of 90° bear against the box sides 1 of the fitted brick. On the inside the box-shaped base is located by the points of two fins which bear against cooperating wall faces. In the third example the fitted brick is located by three fins of which two bear with their sides against the outside walls of the box, whereas the point of a third cooperates with the inside face of one of the walls of the box.

FIGS. 8 to 11 illustrate combinatorial possibilities which arise because the clearance gaps between the points of neighboring fins 7 are all equal. This permits two bricks placed side by side to be connected together by a third brick (FIGS. 8, 9). The open box-shaped base of the coupling brick embraces one half of the superstructure of each of the two bricks that are to be coupled. The resultant frictional fit between cooperating walls 6 is sufficient to create a stable combination of bricks.

Alternatively, the provision of the same constant width clearance gap 9 between the ends 8 of the fins also permits three bricks to be fitted together in the manner illustrated in FIGS. 10 and 11. In this instance the inner ends 10 of neighboring fins 7 are used to grip the two walls 6 of two adjacent bricks. This also creates a firm connection in which — in contradistinction to FIGS. 8 and 9 — the brick underneath couples two bricks above.

Five individual bricks can be combines in a major constructional unit. It is again necessary to ensure that the gap width between the superstructures of two neighboring bricks is the width 9. The combinatorial possibilities of joining the bricks are thus preserved. As a basis for a major building, a mounting plate may also be provided. In such a case a plurality of separate superstructures are combined on a plate of larger size so that the erection of the building can proceed from a flat and level surface on exactly perpendicular building lines. By way of another accessory, bricks may be so contrived that the base 1 carries a sloping or V-shaped roof surface. Such bricks can then be used for the construction of a roof, the V-shaped bricks being used for the construction of the ridge.

It is, of course, to be understood that the present invention is by no means limited to the specific showing in the drawings, but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A toy brick comprising a box-shaped part with side and end walls and with a top wall while being open at the bottom, and a plurality of elastically deformable holding means connected to the outside of said top wall in a symmetrically paired arrangement, at least some of said holding means being fin-shaped, said fin-shaped holding means being arranged crosswise with regard to each other with a gap between each two holding means facing each other with their adjacent ends, one end of two holding means in crosswise arrangement respectively pointing to two adjacent corners of said box-shaped part.

2. A toy brick according to claim **1**, in which said box-shaped part has an oblong cross section.

3. A toy brick according to claim **1**, in which said box-shaped part has a square cross section.

4. A combination according to claim **1**, in which said box-shaped part has four corners frictionally engaging four of said holding means.

5. A toy brick according to claim **1**, in which each of said holding means has a relatively long and narrow cross section.

6. A toy brick according to claim **1**, in which the height of each of said holding means approximately equals one-third of the height of said box-shaped part.

7. A toy brick according to claim **1**, in which each of said holding means forms a rectilinear element.

8. A toy brick according to claim **1**, in which said holding means are arranged in pairs so that one end of each pair of holding means faces an adjacent end of a holding means pertaining to the same pair of holding means, while said adjacent ends define a gap therebetween.

9. A toy brick according to claim **8**, in which said side and end walls have substantially identical thickness, and in which the width of said gap approximately equals twice the thickness of one of said walls.

10. A toy brick according to claim **1**, in which the ends of the fin-shaped holding means are beveled so as to define a V-shaped contour.

11. A combination according to claim **1**, in which said holding means form groups of four fins with the fins of each group arranged crosswise and with each two oppositely located fins of each group aligned with each other and their inner ends spaced from each other, and in which at least two walls of one box-shaped part are in frictional engagement with at least three fins of the other box-shaped part.

12. A toy brick comprising a box-shaped part with side and end walls and with a top wall while being open at the bottom, and a plurality of elastically deformable holding means connected to the outside of said top wall in a symmetrically paired arrangement, at least some of said holding means being fin-shaped, all of said holding means being fin-shaped and grouped in groups of four arranged crosswise with regard to each other while defining a gap therebetween and between oppositely located fins, the gap between oppositely located fins being located substantially along a straight line at least approximately parallel to said side walls.

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