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(54) BUILDING ELEMENT ESPECIALLY FOR TOYS

KONSTRUKTIONSELEMENT, INSBESONDERE FÜR SPIELZEUGE

ELEMENT DE CONSTRUCTION POUR JOUETS

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Description

[0001] This invention relates to a set of building elements as described in the first part of claim 1.

[0002] A great number of different embodiments of building bricks, especially for toys, are known. Among these are only few which can be connected in a greater number to form a coherent area of random size without holes, and where the elements in addition can be kept together without the help of other aids, such as glue, bottom plates or the like.

[0003] An example of such a building brick are shown in GB-A-1 127 168 by Arthur Fischer. His invention relates to a building brick of the type adapted for interlocking engagement with other bricks by means of a re-entrant tongue and groove connection. This kind of building bricks can be put together by a sliding fit when a vertical tongue are introduced into a groove from above. These bricks have the disadvantage that they can not be pushed together or released sideways, because the tongue have a firm locking function in the groove.

[0004] However the are known building bricks which also can be slided together sideways manually. In European Patent Specification No. 69 141 are described such building bricks. The inventor of those bricks is the same as the inventor of the building bricks in this patent. The new elements can, therefore, be seen as a further development of those in the above-mentioned European Patent Specification described building bricks/building elements.

[0005] Those and other known building bricks have, apart from their different advantages, some drawbacks. Such building bricks have to have relatively big tongues and accordingly deep grooves so that they can be kept suitably interlocked. This results in the building brick having an outline when seen from above that deviates quite a lot from the form of a square, which is the polygon that will be easiest to place correctly when connecting a great number of identical building bricks to form different patterns. In the following the square is therefore used as an example of the fundamental polygon, which can also be formed as a union of two or more of such squares. With deep grooves and matching long tongues it is also difficult to secure that the building bricks/building elements are pushed uniformly tight together, which is necessary especially for the precise forming of greater patterns with many small building bricks. Further with such building bricks it can be difficult to avoid that the assembled building bricks are displaced among themselves or literally falls apart. This will often be the case when tongues and grooves not are so precisely adapted that it for instance can be difficult especially for minor children to put the building bricks together well enough with their hands only, especially if the building bricks are made of a fairly hard material, such as impact strengthened polystyrene, polypropylene, or ABS. To make building bricks as close to the ideal square shape as possible the choice has often been to make the building bricks relatively big so that the matching tongues and grooves meant for connection seem smaller. But this has, on the other hand, led to the drawback that details and contours will be substantially coarse in all the patterns one can form of such building bricks, which limits their usability as mosaic bricks.

[0006] The building bricks according to the invention are characterized by the statement in the characterizing part of claim 1.

[0007] As the building bricks by their sideways connection can be clicked together, and preferably with a distinct audible click, one secures that the building bricks are always correctly placed with the same distance and very close to each other which is a great advantage when constructing especially bigger patterns. At the same time it is hereby obtained that tongues and grooves can be made exceptionally small in relation to the length of the edge of the basic square, which normally forms the primary form of the building brick, and whose edgeline can therefore be made very small. As the individual elements can be clicked together, the assembly will also be so suitably firm, without the building bricks on the other hand being too tight for children to put together and separated with their hands only. By forming the elements in such a way that especially the width of the tongues and thereby of the corresponding grooves, understood as the maximum distance from the square, is extra small, at least less than a fifth of the edgeline of the square and preferably smaller, an extra advantage is obtained. Hereby it will be easier, or even possible, sideways to put a forth building brick together with three other already assembled elements to form a rectangular unit, which is a great advantage especially when constructing bigger patterns. Especially the audible clicking together also makes it much more funny to put together the building bricks related to the invention than just to slide them together from above.

[0008] When working with the mosaic bricks it appears from the abovementioned that the individual building bricks must be suitably small to obtain sufficiently detailed patterns on limited areas. Thereby you also realize that to make the mosaic bricks function in practice they must be able to be put together mutually and from the side individually and not just assembled row by row or be slid together carefully from above. This has the result that the individual tongues their respective grooves not only have to be rather small especially with regard to their width as defined above, but at the same time they should also be placed as far away as possible from the corners of the basic square. This results in a suitable version with only a single tongue or a single groove placed in the middle of the side of the basic polygon, preferably the square. In the opposite case it can be difficult or even impossible to place a forth element with three already united elements to a coher-

ent square by assembling sideways, which as mentioned forms the simple but also very crucial examination whether the mosaic bricks will function well enough for the wanted connection of bigger coherent areas. To give an impression of how small scales you can obtain when the building bricks are able to be clicked together, it can be pointed out that the width of the tongues, as defined above can be made at least less than 1 mm and the side in the basic square less than 10 mm. Hereby it will be possible with the building elements related to this invention to produce a great variety of patterns with extremely fine details.

[0009] In a specially suitable version of the building bricks related to this invention the basic polygon is a square with, as mentioned above, just one single tongue on each of the two of the opposite or possibly adjacent sides and correspondingly one groove in each of the two other sides of the square all placed in the middle of the side of the square, and at the same time the tongues as well as the grooves have a length, measured along the sides of the square, which is just a third of the edge line of the square while their width is less than half thereof. This gives a suitable building element relating to the invention both aesthetically and with the possibility of connecting the elements in more than one way as it appears from the drawing.

[0010] The rest of the details of the version of the building elements relating to the invention as well as the different advantages hereby will be described in the following with reference to the drawings, where

fig. 1 shows four connected building elements of a known type of mosaic brick,
fig. 2 two of the same known type of building elements connected in another way,
fig. 3 a building element referring to the invention seen from above,
fig. 4 the same seen from below in cross section,
fig. 5 the same seen from the side,
fig. 6 another version of the stud of the building element seen from above,
fig. 7 another version of the bottom of the building element seen from below in cross section
fig. 8 a detailed picture of a tongue and a groove of two building elements referring to the invention seen in cross sections,
fig. 9 another version of a building element with reference to the invention,
fig. 10 the same seen from below in cross section
fig. 11 three connected elements of the same with a fourth ready for connection herewith,
fig. 12 an alternative embodiment of the building element seen from the side,
fig. 13 more of the same seen connected from above,
fig. 14 a building element of rectangular outline seen in cross section,
fig. 15 another version of the same type seen in cross section,
fig. 16 two identical building elements seen in cross section assembled to a square element,
fig. 17 a building element with a regular hexagon as the basic polygon, and
fig. 18 several of a covered type hereof seen connected from above.

[0011] As it will appear from fig. 1 showing a known version of a mosaic brick for which has earlier been obtained European patent No. 69 141 by the inventor of the here mentioned building brick, the up to now known building elements have some disadvantages that make their practical use difficult. It is seen from the figure showing four united elements of the known mosaic brick, seen from above, that every single building element can in principle be regarded as a box 1 with a basic cross section being a square 2 with its four corners 3. On two of the opposite sides of the square there is a tongue 4 and on the two other sides corresponding deep grooves 5 all having the length as well as the width equal to a third of the sideline of the square. This has the advantage that the elements can be united on the same plane in more than one way. Reversely the great deviance from the basic shape of a square has the disadvantage that it is difficult with such mosaic bricks to make sufficiently detailed and clearly defined patterns with differently coloured mosaic bricks. Another disadvantage is that these known building bricks are often not put together correctly in relation to each other to obtain a bigger connected area without openings. This can only be obtained when each element in the plane is placed at right angles to each of the nearest elements all the time as shown in fig. 1 and not parallel to each other as shown in fig. 2. It shall be noted that only three of the four assembled known elements shown here can be put together from the side only. The last element in the assembly must as a result of the long tongues 4 and the deep grooves 5 be slid into place from above. The four element can however be put together two and two, as well as more building elements can be put together sideways row by row.

[0012] Fig. 2 just shows two known building elements of the same kind as shown in fig. 1 only put together in a different way, namely parallel to each other on the plane and displaced a third of the length of the edge line in the basic square 2. The two basic squares 2a and 2b are hereby seen to cut into each other. The placing shown here can certainly be an advantage, e.g. to give variations in the side of a greater pattern. But this type of assemblies can, on the other hand, create great disadvantages in the form of unintended holes or bad connections inside the pattern, because you can easily put the building bricks together in this way instead of the way mentioned in fig. 1.

[0013] Fig. 3 indicates, on a relatively big scale, a building element according to the invention seen from above, whereby similarities to as well as differences

from that in fig. 1 and 2 shown known building elements appear. It will be noted that the tongues 4 and the grooves 5 are shaped in such a way that they can be suitably clicked together with the corresponding grooves and tongues on other identical building elements for a suitable mutual retention. This is achieved by the length of the tongue 4 and the groove 5 measured along the edgeline of the basic square 2 are a little less in an area nearer to the square than a bit further out, as well as both tongues 4 and grooves 5 being suitably rounded to ease the assembling and the subsequent separation by the hands only. It is also seen that the tongues 4 and the grooves 5 have a much smaller width, understood as the greatest distance from the basic square 2, than on the known element shown in fig. 1 and 2. In that way the basic square 2 appears more distinct and with clearly indicated corners 3, which makes a correct assembly of more elements into bigger patterns more easy. To further secure of this the box 1 can at the top be furnished with a stud 6 which is seen indicated by its circular outline, as the studs of the individual elements will be seen lying in straight rows by a correct assembly. The primary intention with the stud 6 is, however, that two or more elements can thereby be assembled directly upon each other, as the stud 6 is designed so it fits precisely in the corresponding cavity in the bottom of the building element.

[0014] Fig. 4 is a horizontal cross section through the same building element seen from below. The punctuated circle corresponds to the outline of the stud 6 which is just seen to fit into the cavity in the bottom 7. Between the opposite to each other placed grooves 5 the cavity is suitably adjusted to the rounding of the stud so that the stud 6 is kept in its correct position in a better way, but otherwise the thickness of the wall of the building element is seen to be appropriately uniform and mainly of the size of half the width of the tongues 4 as defined above. This gives a suitable moulding, a saving of material, plus a suitable flexibility in the building elements when assembling and separating them.

[0015] Fig. 5 shows the same element seen from the side where the stud 6 protrudes the top 8 of the box 1 and has a rounded upper edge 9 to ease the connection in the vertical plane to corresponding or other known types of building elements. It is noted that the height of the box 1 is bigger than the length of the edge of the basic square which strongly assists to improve the cohesion, which is especially important in bigger assemblies. The relatively great height also has the effect that the elements can be put together displaced in very different heights, whereby also interesting space figures can be formed.

[0016] Fig. 6 shows the same type of building brick seen from above but with another outline of the stud 6, here designed as a rounded octagonal star. There may also be other versions of the stud 6 just as it may be totally avoided. This last solution especially because the building elements relating to the invention can also be connected in the sides by means of their long grooves 5 and tongues 4 and in this way be mutually displaced in vertical direction to an even considerable stepless variation of their mutual difference in height.

[0017] In fig.7 is seen another version of the bottom 7 of the building element according to the invention. By putting small extra tongues 10 inside the bottom 7 and placed in such a way that together they can hold a square figure, you can in an easy way achieve that these building elements can be assembled with other types of building elements, which have corresponding big square excrescences. Furthermore, you can with this extra tongues 10 achieve that you can also design the outline of the stud 6 as a corresponding big square which as regards the outlook can be an advantage.

[0018] Fig. 8 shows a detailed picture of a tongue 4 and a groove 5 on two building elements according to the invention. As it will be noted the tongue has, a short distance from the basic square, a somewhat bigger extension than slightly nearer the square. This has the effect that such a tongue 4 with a modest use of force can be pressed into the groove 5 of a corresponding building element and still be interlocked suitably firmly herewith. The rounded form of the tongue 4 has the effect that it can more easily be clicked into the corresponding groove 5. The groove 5 is seen to be of a so to speak identical outline as the tongue 4. So it is noted that the radius of curvature 11 innermost in the groove 5 and corresponding innermost on the tongue 4 is a little less than the radius of curvature 12 outermost on the groove 5 and outermost on the tongue 4, as it has shown that there can hereby in practice be achieved a better clicking together between the elements when assembling them.

[0019] Fig. 9 shows the outline of another version of a building element according to the invention, where the basic polygon 2 is also a square and where the length of the tongues 4 and the grooves 5 measured along the edges of the square is also a third of this. The difference from the version in fig. 3 is that the two tongues 4 are placed on the two adjacent sides of the square and the two grooves 5 on the two other likewise adjacent sides. Both the tongues 4 and the grooves 5 have a width as above defined, which is less than half their length, whereby this version is at all possible, contrary to if the width was also a third of the length of the edge of the square, as the case is on that in fig. 1 shown known building element.

[0020] Fig. 10 shows the same version of a building element according to the invention seen in a horizontal cross section from below. It is noted, especially when comparising with the corresponding cut i fig 4 that this version will not be quite so suited as the one shown earlier, whose symmetrical construction appears more harmonic and at the same time more material saving.

[0021] Fig. 11 shows a building element of a design as shown in fig. 9 and 10, which is being put together with three already assembled elements of the same

type. This crucial test for mosaic bricks is also seen to be possible with this version because the tongues 4 only extends a little from the basic square, just as there is only a single tongue on each side, both placed in the middle of the side.

[0022] Fig. 12 shows another possibility for designing a building element according to the invention here shown from the side. By comparison with fig 5 it shows that this version in many respects corresponds with that shown in fig. 3, 4 and 5. The deviant from this appears by placing a small cover 13 over the upper part of the groove 5 suitably of about the same thickness as the thickness of the material of the building brick and precisely covering the groove 5 seen from above and in line with the top of the upper part 8 of the box 1 itself. At the same time a bigger or smaller piece of the upper part of the tongues 4 is left out, so they can still fit into the grooves 5. With this design of the building element according to the invention a special advantage is obtained. Seen from above they will protrude as quite regular squares without grooves and tongues only with the exception of the out-turned tongues of those elements placed outermost in the respective pattern as shown in the next figure. These building elements according to the invention can also be clicked together on the sides; but it is a disadvantage that they cannot or can only to a limited extent get displaced stepless for each other in the height as in the hitherto shown versions.

[0023] Fig. 13 shows a total of sixteen assembled building elements of the design form fig. 12 seen from above. As it appears you can hereby obtain a regular square pattern as the coverings 13 just cover all the grooves 5, which can be a special advantage in many cases. This design is made possible because the building element according the invention is provided with such suitably small tongues 4 and grooves 5 that a fourth building element can be fitted in sideways by clicking it together with three already assembled elements to form a square. However the building elements cannot be fitted together from above as with the hitherto shown versions.

[0024] Fig. 14 shows a version of a building element according to the invention where the basic polygon 2 is a rectangle. The element is shown in a horizontal cross section with a punctuated circle marking the location of the stud 6. It appears from this that the building element in principle just corresponds to two joined elements of that in fig. 3, 4 and 5 shown design, which has a square as a basic polygon 2. As two such elements can replace the one shown, even having different colours, it appears to be an advantage with respect to the details of the pattern only to have the smallest elements in the system. This is also because it is difficult to place elements with more than one tongue on already assembled elements by a sideways connection.

[0025] Fig. 15 shows a horizontal cross section of an element of a similar type. From this it appears that the version shown in fig. 14 is, after all, more suitable, because there out of consideration for the possible attachment to another building element by means of its stud 6, shown as a punctuated circle, only a smaller and more evenly distributed amount of material is needed in this case.

[0026] Fig. 16 shows a cross section seen from below of two identical building elements according to the invention, where the basic polygon 2 is a triangle put together to form an element that just corresponds to the one shown in fig. 3, 4 and 5. The cut is made so high up on the building brick, that it is above the point where a stud 6 from another element will reach up to when it is assembled. Further down a corresponding cut might resemble the one shown in fig. 4 if you imagine that this element is cut along a diagonal, so that a stud 6 from another element can be fitted in. Such "half" elements, suitably of different colours, can possibly be part of a system of building elements of the type shown in fig. 3, 4 and 5, whereby for instance even more detailed patterns can be created if necessary.

[0027] Fig. 17 shows the outline of a building element according to the invention, where the basic polygon 2 is an equilateral hexagon with corners 3. With a multitude of such identical elements honeycomb cell shaped patterns can be built, which in certain cases can be an advantage. The deviation from a regular hexagon however seen to be rather visible because of the tongues 4 and the grooves 5.

[0028] Fig. 18 shows a number of building elements according to the invention where the basic polygon is also an equilateral hexagon as in fig. 17, but where the individual building element is, at the same time, provided with corresponding covers 13 just as the building element shown in fig. 12 and fig. 13. Hereby you achieve that the assembled elements, seen from above, constitute pure regular hexagons except for elements in the outermost rows. Thus extremely beautiful patterns can be built corresponding to what is known from e.g. beads. But because of the special clicking together of the elements according to the invention this does not, as with beads, lead to disadvantages such as need for bottom plates or welding together with heat, which prevents reuse.

[0029] The examples shown on the drawing are only part of the many different versions the building element according to the invention can assume. In addition to the square, rectangular and hexagonal basic forms used on the drawing there might have been shown examples of other, mainly equilateral polygons. But the square is used here in specifically because it must be considered the best starting point for a system of identical building elements according to the invention. Furthermore, beside the shown examples, there can as mentioned be made building elements comprising 4, 6, 8 or any other number of basic squares with a corresponding number of studs and cavities in the bottom as well as the corresponding number of tongues and

grooves. There are not depicted more of such versions because they will, as mentioned above, be less appropriate. There might also be building elements designed as other parts of a square element than the one shown in fig. 16.

[0030] The design of the individual tongues and hence of the corresponding grooves can also be varied in many more ways than those shown on the drawing, e.g. concerning the relation between length and width plus the size and placing of the roundings in order to obtain the best possible clicking together. As an example the extent along the side of the square can be half of its length or another fraction than the third, which on the drawing is generally preferred as the most practical.

[0031] The shown cylindrical stud may also have other designs than the herein shown circular or rounded octagonal. A square stud is thus mentioned, but there may also be other outlines, and the stud can also comprise more than a single cylindrical figure. The studs can even be designed in such a special way that the studs of two single or assembled elements, which have the studs turned towards each other, are able to attach the elements studs against studs. The individual stud may also at the top be provided with channels e.g. placed in crossform parallel to the sides of the basic square and with the same cross section as the cross section of a groove. Thus the stud is also able to secure a corresponding building element in one of its tongues side against top.

[0032] The building elements according to the invention might furthermore be made of a number of different materials. Most suitable would probably be, as mentioned, a thermoplastic material such as rigid polystyrene, a hard polypropylene, or an ABS.

[0033] The building elements according to the invention are as mentioned especially suited, in their most simple basic shape together with other identically shaped building elements but of several different colours, to be used as a mosaic brick for toys. The building element according to the invention may however also be used for several other purposes, such as easily assembled signboards or planning boards, as you can build for instance the different letters and numbers of various sizes of the same basic building element. In the same way the building elements can be suited for the educating of children in reading and writing, as the children themselves can build the letters and can hereby at the same time in an entertaining way improve the movement of their fingers. The building elements according to the invention also can be used for building up self-bearing partition walls, e.g. on stands for exhibitions, as well as for sketching by artists for mosaics space figures or other creative products, such as colourful, but cheap jewellery. All in all the building element according to the invention seem to contain vast possibilities for uses for totally different purposes for both children and adults, because they can in a simple way be assembled in all three dimensions.

Claims

1. Set of building elements especially for toys, where each element comprises the basic outline of a mainly hollow and relatively thin-walled box (1) with an open end (7), and where a horizontal cross-section of the box (1) apart from tongues (4) and grooves (5) represents a square or another polygon, a so-called basic polygon (2), in which the corners (3) may be suitably rounded, and where on at least one of the sides of the basic polygon (2) there is at least one tongue (4) and on at least one of the other sides one corresponding groove (5), **characterized** by the fact that the corresponding tongues (4) and grooves (5) are designed in such a way, that they can be clicked into each other for mutual retention with an audible click, as the length of the tongue (4) at a certain distance from its top measured along its respective side of the basic polygon (2) is bigger than the length of the tongue (4) somewhat nearer to its bottom, and the length of the groove (5) measured along its respective side of the basic polygon (2) at a certain distance from the opening is smaller than the length of the groove (5) somewhat deeper in the groove, and at the same time both tongues (4) and grooves (5) are suitably rounded, just as the material for the elements are of a suitable hardness, so that a clicking together and a following separation easily can be performed manually.

2. Set of building elements according to claim 1, **characterized** by the basic polygon (2) being a square, and on each of the two opposite or adjacent sides of the square there are only one tongue (4) and on each of the two other sides only one groove (5), and where both tongues (4) and grooves (5) are placed in the middle of the respective sides of the square.

3. Set of building elements according to claim 1, **characterized** by the fact that the height of the building element is bigger than the smallest edge length of the basic polygon (2).

4. Set of building elements according to claim 1, **characterized** by the fact that the width of the tongues (4) and consequently of the corresponding grooves (5) understood as the maximum distance from the polygon (2) is so small compared to the length of the edges of the polygon (2) that it is at least five times smaller than the smallest side and preferably even smaller, so that a fourth element is able to be clicked together with three others already assembled elements to a square by a sideways connection only.

5. Set of building elements according to claim 1, **characterized** by the fact that both tongues (4) and

grooves (5) run at a right angle from the bottom (7) and that the two horizontal cross sections through the box (1) from the bottom (7) and up to the top of the tongues (4) have identical outlines, whereby assembled elements can be displaced stepless in the height relatively to each other without having to be separated or loosened from e.g. a composed pattern of building elements.

6. Set of building elements according to claim 2, **characterized** by the fact that the length of the tongue (4) and consequently the length of the groove (5) measured along the side of the square amounts to a third of its edge length, while the corresponding widths of tongues (4) and grooves (5) are less than half their length.

7. Set of building elements according to claim 1, **characterized** by the fact that on the top (8) of the box (1) there is at least one protrusion in the form of a preferably cylindrical stud (6) with e.g. a circular or a rounded octagonal starformed cross section just meant to fit into the cavity/cavities in the bottom (7) of a corresponding building element, so that the elements can be mutually retained also when placed directly on top of each other.

8. Set of building elements according to claim 1, **characterized** by the fact that the thickness of the material in the hollow box (1) is preferably uniform and so small, that is less than and preferably about half of the distance from the polygon (2) to the outermost of the tongue (4), that is corresponding to the width of the tongues (4), so that these can easily be pressed together and the grooves (5) correspondingly extended a bit, which eases the mutual assembling and results in a suitable retention, especially if the building element is of a relatively hard thermoplastic, such as rigid polystyrene, ABS or polypropylene.

9. Set of building elements according to claim 1, **characterized** by the fact that the cavity/cavities in the bottom (7) are designed with extra tongues (10) in such a way, that they can herein retain building elements with a stud (6) with a square outline plus other types of building elements that have for instance a square cross section which fits into the cavity.

10. Set of building elements according to claim 1, **characterized** by the fact that the uppermost of the grooves (5) has a cover (13), which seen from above levels with the sides of the basic polygon (2), and that the tongues (4) are shortened at the top corresponding to the thickness of the cover (13) or more, so that more building elements can be assembled sideways in the plane to bigger units, where, seen from above, only appears to be a regular cubical, hexagonal, or a corresponding regular pattern, except for the outermost elements.

Patentansprüche

1. Satz von Bauelementen, insbesondere für Spielzeug, wobei jedes Element die Kontur eines hohlen und verhältnismäßig dünnwandigen Kastens (1) mit einem offenen Ende (7) aufweist und ein horizontaler Querschnitt des Kastens (1), abgesehen von Zungen (4) und Aussparungen (5), ein Quadrat oder ein anderes Polygon, ein sogenanntes Grundpolygon (2), darstellt, bei dem die Ecken (3) passend gerundet sein können, und wobei auf mindestens einer der Seiten des Grundpolygons (2) mindestens eine Zunge (4) und auf mindestens einer der anderen Seiten mindestens eine entsprechende Aussparung (5) vorhanden sind, dadurch **gekennzeichnet**, daß die sich entsprechenden Zungen (4) und Aussparungen (5) derart ausgebildet sind, daß sie sich zum gegenseitigen Festhalten mit einem hörbaren Klick ineinander einrasten lassen, da die jeweils längs ihrer Seite des Grundpolygons (2) gemessene Länge der Zunge (4) in einem bestimmten Abstand von deren Oberkante größer ist als die Länge der Zunge (4) etwas näher an deren Fuß und die jeweils längs ihrer Seite des Grundpolygons (2) gemessene Länge der Aussparung (5) in einem bestimmten Abstand von deren Öffnung kleiner ist als die Länge der Aussparung (5) etwas tiefer in der Aussparung und gleichzeitig sowohl die Zungen (4) als auch die Aussparungen (5) passend gerundet sind, so daß ein Ineinanderrasten und anschließendes Trennen unschwer von Hand erfolgen können.

2. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß das Grundpolygon (2) ein Quadrat ist und auf jeder der beiden gegenüberliegenden oder angrenzenden Seitenflächen des Quadrats nur eine Zunge (4) und auf jeder der beiden übrigen Seitenflächen nur eine Aussparung (5) vorhanden sind, wobei sowohl Zungen (4) als auch Aussparungen (5) jeweils in der Mitte der Seitenfläche des Quadrats angeordnet sind.

3. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß die Höhe des Bauelementes größer ist als die kleinste Kantenlänge des Grundpolygons (2) .

4. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß die als maximaler Abstand vom Polygon (2) verstandene Breite der Zungen (4) und damit der entsprechenden Aussparungen (5) im Verhältnis zur Kantenlänge des Polygons (2) so klein, d.h. mindestens fünfmal so klein wie die klein-

ste Seite und vorzugsweise noch kleiner ist, daß das Ineinanderrasten eines vierten Elementes mit drei anderen bereits verbundenen Elementen zu einem Viereck nur mit seitlicher Verbindung möglich ist.

5. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß sowohl Zungen (4) als auch Aussparungen (5) rechtwinklig vom Boden (7) hinauf verlaufen, und daß die beiden horizontalen Querschnitte des Kastens (1) vom Boden (7) hinauf bis zur Oberkante der Zungen (4) gleiche äußere Konturen aufweisen, wodurch miteinander verbundene Elemente stufenlos relativ zueinander nach oben verschoben werden können, ohne z.B. von einem zusammengesetzten Muster getrennt oder gelöst zu werden.

6. Satz von Bauelementen nach Anspruch 2, dadurch **gekennzeichnet**, daß die längs der Seite des Quadrats gemessene Länge der Zunge (4) und damit die Länge der Aussparung (5) ein Drittel dessen Kantenlänge ausmachen, während die entsprechenden Breiten der Zungen (4) und Aussparungen (5) weniger als die Hälfte ihrer Längen ausmachen.

7. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß auf der Oberseite (8) des Kastens (1) mindestens ein vorzugsweise in der Form eines zylindrischen Stutzens (6) mit z.B. kreisförmigem oder gerundet achteckig sternförmigem Querschnitt ausgebildeter Vorsprung (6) angeordnet ist, der dafür bestimmt ist, genau in die Höhlung(en) im Boden (7) eines passenden Bauelementes hineinzupassen, so daß die Elemente sich auch dann gegenseitig festhalten können, wenn sie unmittelbar übereinander angeordnet werden.

8. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß die Wanddicke des hohlen Kastens (1) vorzugsweise gleichmäßig und derart klein, d.h. kleiner als und vorzugsweise halb so groß wie der Abstand des Polygons (2) vom äußeren Rand der Zunge (4), d.h. entsprechend der Breite der Zungen (4), ist, daß diese unschwer zusammengedrückt und die Aussparungen (5) entsprechend ein wenig erweitert werden können, was die gegenseitige Verbindung der Elemente erleichtert und ein passendes Festhalten zur Folge hat, insbesondere dann, wenn das Bauelement aus einem verhältnismäßig harten thermoplastischen Kunststoff wie schlagfestem Polystyrol, ABS oder Polypropylen besteht.

9. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß die Höhlung(en) im Boden (7) derart mit zusätzlichen Zungen (10) ausgebildet ist/sind, daß hierin Bauelemente mit einem Stutzen (6) quadratischer Kontur sowie Bauelemente anderer Bauarten, die z.B. einen in die Höhlung hineinpassenden quadratischen Querschnitt aufweisen, festgehalten werden können.

10. Satz von Bauelementen nach Anspruch 1, dadurch **gekennzeichnet**, daß die Aussparungen (5) oben eine überdeckung (13) aufweisen, die in Draufsicht mit den Seiten des Grundpolygons (2) fluchtet, und daß die Zungen (4) oben entsprechend der Dicke der Abdeckung (13) oder mehr gekürzt sind, so daß mehrere Bauelemente in der seitlichen Ebene zu größeren Einheiten verbunden werden können, wobei im Draufsicht, abgesehen von den außenliegenden Elementen, nur ein regelmäßig kubisches, sechseckiges oder ähnliches Muster zu sehen ist.

Revendications

1. Jeu d'éléments de construction spécialement pour jouets, où chaque élément présente le contour de base d'une boîte principalement creuse à parois relativement minces (1) avec une extrémité ouverte (7) et où une coupe transversale horizontale de la boîte (1) mis à part les languettes (4) et les rainures (5) représente un carré ou un autre polygone, dit polygone de base (2), dont les coins (3) peuvent être convenablement arrondis et où il y a au moins sur l'un des côtés du polygone de base (2) au moins une languette (4) et sur au moins l'un des autres côtés il y a au moins une rainure correspondante (5),
caractérisé en ce
que les languettes (4) et rainures (5) correspondantes sont conçues de telle manière qu'elles peuvent être assemblées l'une dans l'autre avec un déclic audible pour leur retention mutuelle, étant donné que la longueur de la languette (4) à une certaine distance de son sommet mesurée le long de son côté respectif du polygone de base (2) est plus grande que la longueur de la languette (4) un peu plus proche de son fond et que la longueur de la rainure (5) mesurée le long de son côté respectif du polygone de base (2) à une certaine distance de l'ouverture est plus petite que la longueur de la rainure (5) quelque peu plus profonde dans la rainure et qu'en même temps aussi bien les languettes (4) que les rainures (5) sont convenablement arrondies, tout comme la matière utilisée pour les éléments est d'une dureté convenable, de manière qu'un assemblage et une séparation consécutive puissent être effectués aisément à la main.

2. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que le polygone de base (2) étant un carré et que

sur chacun des deux côtés opposés ou contigus du carré il y a seulement une languette (4) et de chacun des deux autres côtés seulement une rainure (5), et où tant les languettes (4) que les rainures (5) sont disposées au milieu des côtés respectifs du carré.

3. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que la hauteur de l'élément de construction est plus grande que la longueur du plus petit bord du polygone de base (2).

4. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que la largeur des languettes (4) et, de ce fait, des rainures correspondantes (5) entendu comme étant la distance maximum du polygone (2) est si petite par rapport à la longueur des bords du polygone (2) qu'elle est au moins cinq fois plus petite que le plus petit bord et, de préférence, encore plus petite, pour qu'un quatrième élément puisse être cliqué ensemble avec trois autres éléments assemblés d'avance en un carré uniquement par un assemblage latéral.

5. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que tant les languettes (4) que les rainures (5) se développent en un angle droit depuis le fond (7) et que les deux coupes transversales horizontales à travers la boîte (1) depuis le fond (7) et jusqu'au sommet des languettes (4) ont des contours extérieurs identiques, de sorte que des éléments assemblés puissent être décalés en hauteur en progression continue les uns par rapport aux autres sans être séparés ou dégagés par exemple d'un modèle composé d'éléments de construction.

6. Jeu d'éléments de construction selon la révendication 2,
caractérisé en ce
que la longueur de la languette (4) et, de ce fait la longueur de la rainue (5), mesurée le long du côté du carré, constitue un tiers de la longueur du bord de celui-ci, tandis que la largeur correspondante des languettes (4) et des rainures (5) est inférieure à la moitié de leur longueur.

7. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
qu'au sommet (8) de la boîte (1) il y a au moins une protubérance, de préférence de forme cylindrique (6), comportant par exemple une coupe transversale octogonale étoilée, circulaire ou arrondie, destinée à s'adapter précisément dans le/les creux au fond (7) d'un élément de construction correspondant, afin que les éléments puissent être retenus respectivement également quand ils sont placés directement l'un au-dessus de l'autre.

8. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que les parois de la boîte creuse (1) est de préférence d'égale épaisseur et si mince qu'elle est inférieure et de préférence environ la moitié de la distance du polygone (2) à l'extrémité de languette (4), soit correspondant à la largeur des languettes (4), de sorte que celles-ci puissent facilement être comprimées et les rainures (5) être proportionnellement élargies un peu, ce qui facilite l'assemblage des éléments et permet d'obtenir une rétention convenable, spécialement si l'élément de construction est exécuté d'un thermoplastique relativement dur tel que du polystyrène rigide, de l'ABS ou du polypropylène.

9. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que le/les creux dans le fond (7) sont conçus avec des languettes supplémentaires (10) de manière à pouvoir retenir des éléments de construction dotés d'une protubérance (6) de contour carré ainsi que d'autres types d'éléments de construction ayant, par exemple une coupe transversale carrée qui s'adapte dans le creux.

10. Jeu d'éléments de construction selon la révendication 1,
caractérisé en ce
que la rainure la plus haute (5) est pourvue d'une couverture (13) qui, vu du haut est alignée avec les côtés du polygone de base (2) et que les languettes (4) sont écourtées au sommet correspondant à l'épaisseur de la couverture (13) ou plus, de manière que plusieurs éléments de construction puissent être assemblés latéralement sur ce plan à des unités plus grandes où, vu du haut, à l'exception des éléments les plus écartés, il n'apparaît qu'une forme régulière cubique ou hexagonale ou un modèle régulier correspondant.

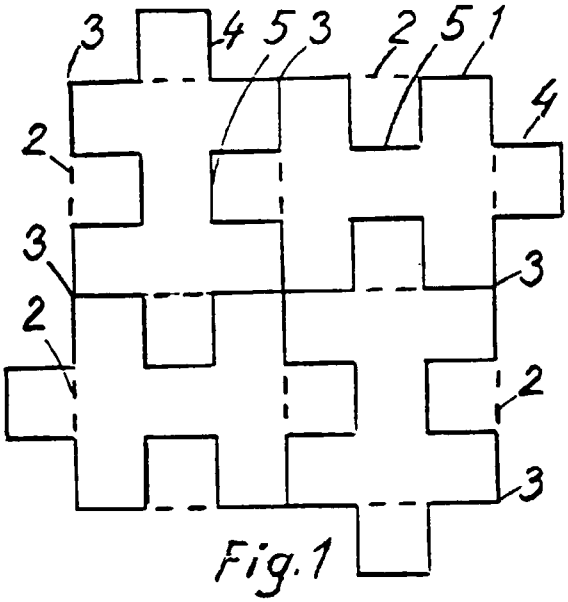


Fig. 1

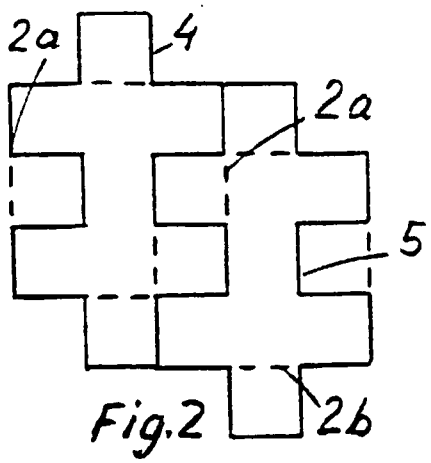


Fig. 2

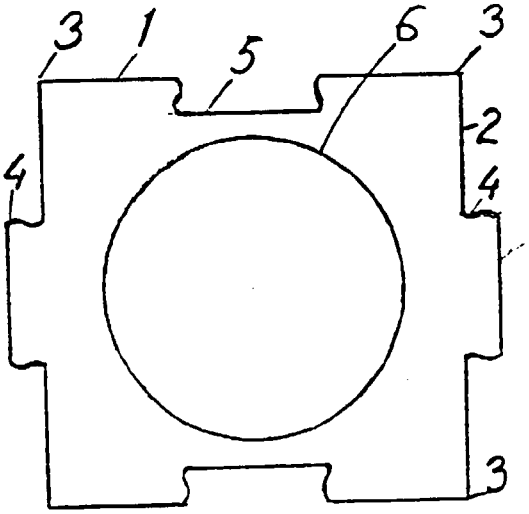


Fig. 3

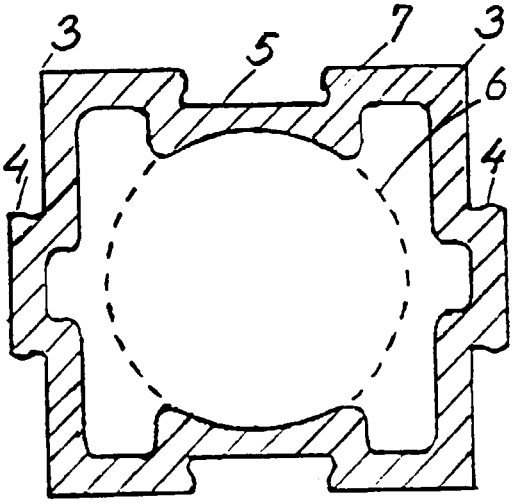


Fig. 4

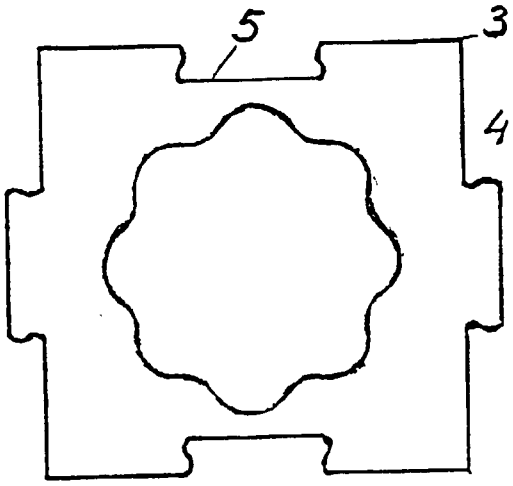


Fig. 6

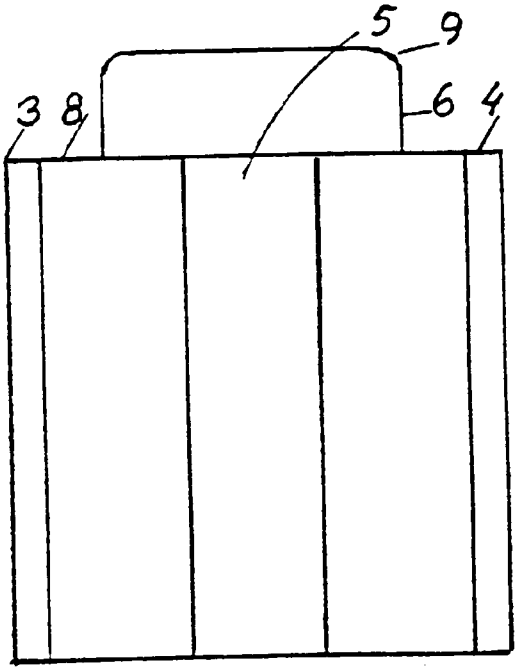


Fig. 5

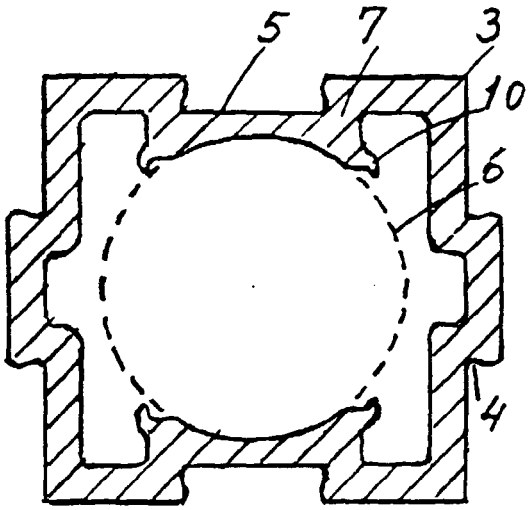


Fig. 7

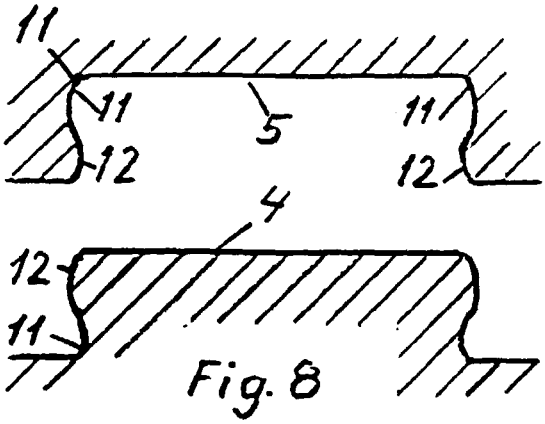


Fig. 8

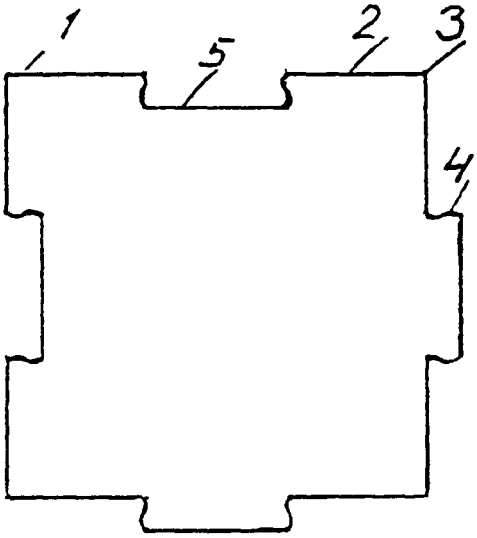


Fig. 9

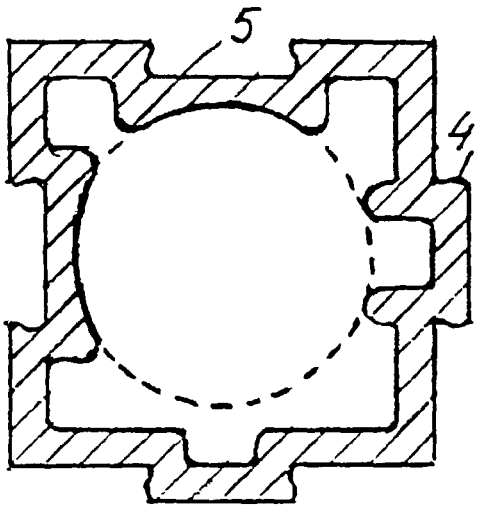


Fig. 10

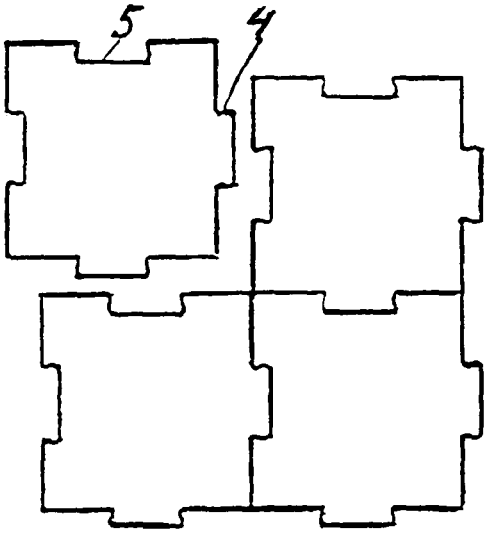


Fig. 11

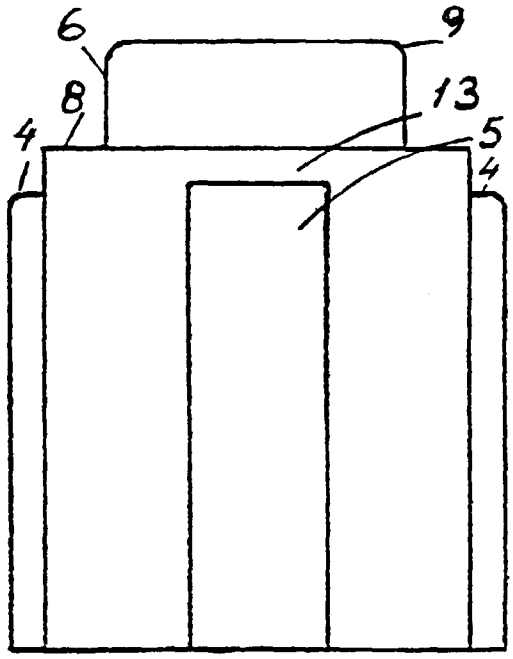


Fig. 12

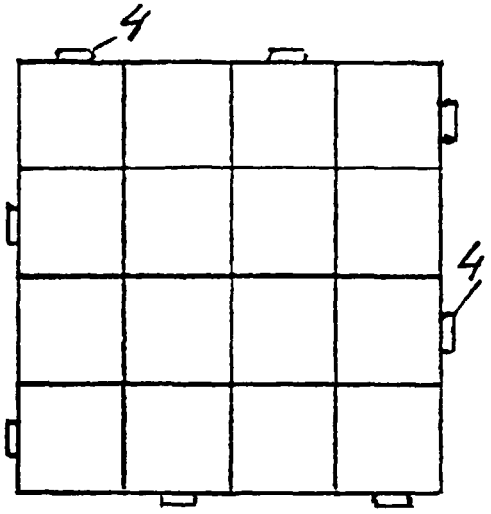


Fig. 13

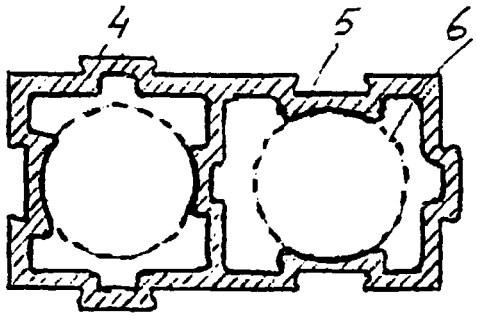


Fig. 14

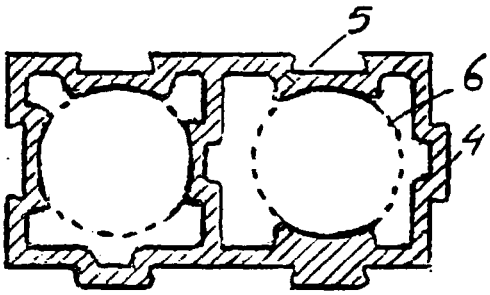


Fig. 15

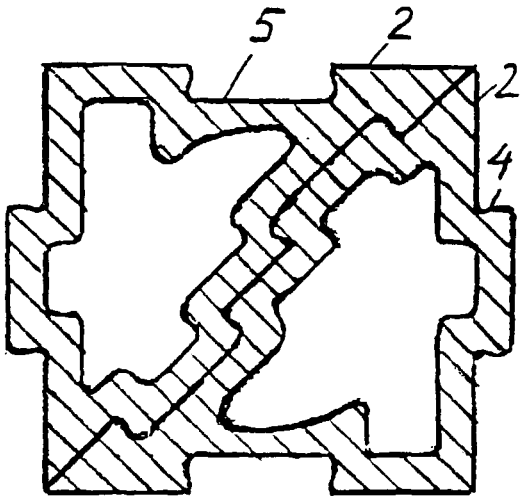


Fig. 16

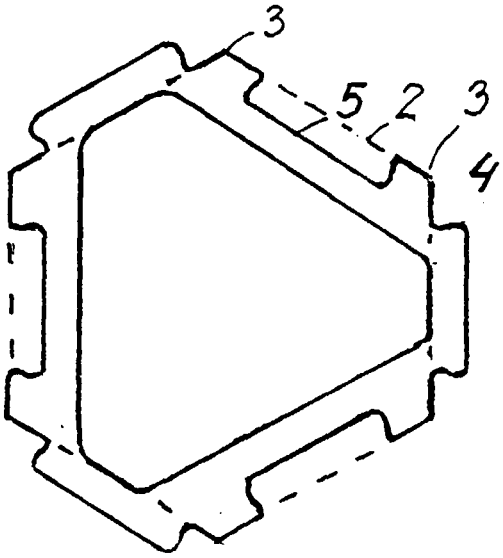


Fig. 17

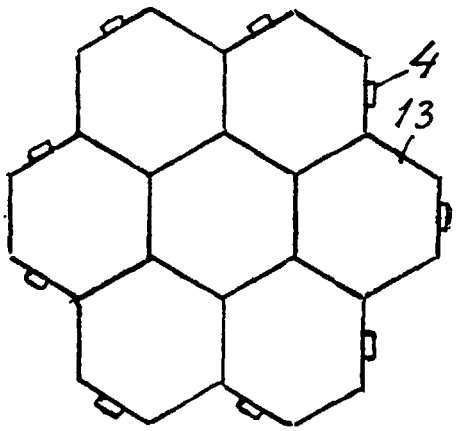


Fig. 18