PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Building Brick for Incorporation in a Constructional Toy or Model.

I, ARTHUR FISCHER, a German citizen, of Tumlingen, Kreis Freudenstadt, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a building brick, preferably of synthetic plastics material, for incorporation in a constructional toy or model. Such bricks of known type are provided with re-entrant grooves and at least one tenon which, for the purpose of connecting the brick to other identical bricks, can make interlocking engagement with grooves of the latter, the tenon being of re-entrant shape matched to the cross-section of the grooves and being of square cross-section so that two opposite lateral surfaces thereof can bear on the groove walls over part of its length, to prevent relative twisting of the interlocking bricks.

Bricks of the type referred to can be assembled in almost any desired manner into toy models or technical models. The versatility in the design of such models is increased by using further components of different shape from the building bricks but provided with similar grooves and/or tenons, such as plates, toothed wheels, etc. Connection of the bricks together is effected by slipping the tenon of one brick into the groove of another. The two bricks thus joined may be relatively displaced and arranged in any desired manner within the range of movement allowed by the groove in which the tenon of a brick has been inserted. The dimensions of the grooves and the tenons are such that relative displacement for the purpose of assembling the bricks remains possible, whereas on the other hand there is sufficient frictional resistance to movement to prevent inadvertent relative displacement of the bricks in the finished model, under the low stresses encountered in this situation. In addition to bricks with tenons of square cross-section which prevent relative twisting of the bricks, other bricks are also known which are provided with tenons of circular cross-section allowing rotation of one brick relatively to the other.

It has been found, however, that tenons of square cross-section frequently tend to break. Observation of children assembling toy models has shown that they will forcibly twist bricks with square tenons relatively to bricks connected therewith, sometimes inadvertantly and in some cases mischievously. Although a resilient synthetic material is employed for these tenons, the resilience is nevertheless insufficient to allow the deformation of the tenon necessary for such a twisting movement without breakage.

The present invention has for its object to provide bricks with tenons of square cross-section which are capable of withstanding inadvertent twisting movements of the above-mentioned kind without being destroyed.

The invention accordingly provides a building brick for incorporation in a constructional toy or model, the brick being formed of a resiliently deformable material and being provided with re-entrant grooves and at least one re-entrant tenon for interlocking engagement with tenons or grooves or like bricks, the tenon being of generally square cross-section so that two of its opposite lateral faces may slidably engage opposite walls of a groove, and the tenon having a slot or recess extending diagonally across its end face, the dimensions of this slot or recess being such as to permit sufficient resilient deformation of the tenon to

[Price 4s. 6d.]

enable rotation of the tenon in a mating groove under the influence of a twisting force smaller than that which would tend to cause breakage of the tenon at its narrowest point.

The diagonal arrangement of this recess increases the resilient yielding capacity of the corners of the tenon which enables it to withstand a twisting movement of one of the bricks relative to the interlocking brick without destruction. Owing to the diagonally arranged recess the corners situated on laterally opposite sides of the recess are enabled to yield resiliently. In the corners bisected by the recess, the resilience attained and the ease of rotatability is still further increased since the distance between the opposite corners in the zone of the recess is reduced in accordance with the width of this recess.

On the other hand, the resilience achieved by the invention and the possibility of mutual twisting of two bricks joined together by means of a tenon of square cross-section is not meant to facilitate the twisting of bricks joined by tenons of square cross-section relatively to each other in normal use. On the contrary it is intended that the function of a tenon of square cross-section, i.e. the establishment of resistance to such mutual twisting, should be preserved. The object of the invention is to provide the possibility of mutual twisting only in cases where a twisting movement is imparted inadvertantly with considerable force, in order thus to prevent destruction of the tenon.

Moreover it is not intended that the slot in the tenon should enable deformation of the tenon to an extent allowing withdrawal thereof through the re-entrant part of the groove. For this reason, preferably the depth of the slot or recess is less than the height of the tenon. If the depth of the recess is dimensioned in this way the possibility that the tenon might be withdrawn from the groove past the restricted portion of the groove lips is prevented. The resilience of the tenon is nevertheless sufficiently increased, due to the recess, for the forcible twisting of the tenon to be possible without destruction. The most advantageous depth of the recess depends, apart from the resilience of the material and other factors, also upon the width of the recess. The exact depth of the recess must therefore be determined for each individual case. A recess of suitable depth has been found to be a recess penetrating up to one third of the region in which the re-entrant part of the tenon bears on the groove walls. If the recess is made considerably deeper there is a risk that the opposite lateral surfaces of the tenon, due to the recess, will be urged towards one another as tension is applied to the tenon and that the distance between these lateral surfaces may become equal to, or smaller than, the distance between the opposite groove edges, allowing withdrawal of the tenon from the groove.

The invention is illustrated by way of example in accompanying drawings, in which:

Fig. 1 is a side elevation, and

Fig. 2 is a plan view of a building brick with tenon.

In the drawings a cube shaped brick is indicated at 1, the brick having re-entrant grooves 2 on its longitudinal faces. On one end face 3 of the brick 1 is provided a tenon 4 which is either integral with the brick 1 or connected thereto in some other suitable way. As shown in Fig. 2, the tenon is of square cross-section. It comprises a portion 5 in which the lateral surfaces are tapered prismatically towards the brick, to fit the cross-section of the grooves of another similar brick shown in broken lines in Fig. 1. The end face 6 of the tenon 4 is provided with a recess 7 the depth of which extends up to the beginning of portion 5. This recess 7 enables the corners 8 and 9 to yield resiliently, and this makes a twisting movement of the square tenon in one of the grooves 2 possible. The corners 10 and 11 situated in the region of recess 7 are not as far apart from one another, due to the recess 7, as the corners 8 and 9. This fact also facilitates a twisting movement of the tenon by increasing the resilient yielding capacity of the lips of the recess in the region of corners 10 and 11.

WHAT I CLAIM IS:—

1. A building brick for incorporation in a constructional toy or model, the brick being formed of a resiliently deformable material and being provided with re-entrant grooves and at least one re-entrant tenon for interlocking engagement with tenons or grooves of like bricks, the tenon being of generally square cross-section so that two of its opposite lateral faces may slidably engage opposite walls of a groove, and the tenon having a slot or recess extending diagonally across its end face, the dimensions of this slot or recess being such as to permit sufficient resilient deformation of the tenon to enable rotation of the tenon in a mating groove under the influence of a twisting force smaller than that which would tend to cause breakage of the tenon at its narrowest point.

2. A building brick as claimed in claim 1, in which the depth of the slot or recess is less than the height of the tenon, extending from the end face of the latter into the region of the widest part of the re-entrant neck portion intended to interlock with a groove.

3. A building brick as claimed in claim

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enable rotation of the tenon in a mating groove under the influence of a twisting force smaller than that which would tend to cause breakage of the tenon at its narrowest point.

The diagonal arrangement of this recess increases the resilient yielding capacity of the corners of the tenon which enables it to withstand a twisting movement of one of the bricks relative to the interlocking brick without destruction. Owing to the diagonally arranged recess the corners situated on laterally opposite sides of the recess are enabled to yield resiliently. In the corners bisected by the recess, the resilience attained and the ease of rotatability is still further increased since the distance between the opposite corners in the zone of the recess is reduced in accordance with the width of this recess.

On the other hand, the resilience achieved by the invention and the possibility of mutual twisting of two bricks joined together by means of a tenon of square cross-section is not meant to facilitate the twisting of bricks joined by tenons of square cross-section relatively to each other in normal use. On the contrary it is intended that the function of a tenon of square cross-section, i.e. the establishment of resistance to such mutual twisting, should be preserved. The object of the invention is to provide the possibility of mutual twisting only in cases where a twisting movement is imparted inadvertantly with considerable force, in order thus to prevent destruction of the tenon.

Moreover it is not intended that the slot in the tenon should enable deformation of the tenon to an extent allowing withdrawal thereof through the re-entrant part of the groove. For this reason, preferably the depth of the slot or recess is less than the height of the tenon. If the depth of the recess is dimensioned in this way the possibility that the tenon might be withdrawn from the groove past the restricted portion of the groove lips is prevented. The resilience of the tenon is nevertheless sufficiently increased, due to the recess, for the forcible twisting of the tenon to be possible without destruction. The most advantageous depth of the recess depends, apart from the resilience of the material and other factors, also upon the width of the recess. The exact depth of the recess must therefore be determined for each individual case. A recess of suitable depth has been found to be a recess penetrating up to one third of the region in which the re-entrant part of the tenon bears on the groove walls. If the recess is made considerably deeper there is a risk that the opposite lateral surfaces of the tenon, due to the recess, will be urged towards one another as tension is applied to the tenon and that the distance between these lateral surfaces may become equal to, or smaller than, the distance between the opposite groove edges, allowing withdrawal of the tenon from the groove.

The invention is illustrated by way of example in accompanying drawings, in which:

Fig. 1 is a side elevation, and

Fig. 2 is a plan view of a building brick with tenon.

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1. A building brick for incorporation in a constructional toy or model, the brick being formed of a resiliently deformable material and being provided with re-entrant grooves and at least one re-entrant tenon for interlocking engagement with tenons or grooves of like bricks, the tenon being of generally square cross-section so that two of its opposite lateral faces may slidably engage opposite walls of a groove, and the tenon having a slot or recess extending diagonally across its end face, the dimensions of this slot or recess being such as to permit sufficient resilient deformation of the tenon to enable rotation of the tenon in a mating groove under the influence of a twisting force smaller than that which would tend to cause breakage of the tenon at its narrowest point.

2. A building brick as claimed in claim 1, in which the depth of the slot or recess is less than the height of the tenon, extending from the end face of the latter into the region of the widest part of the re-entrant neck portion intended to interlock with a groove.

3. A building brick as claimed in claim

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or 2, formed of resilient synthetic plastics material.

4. A building brick substantially as described herein with reference to the accompanying drawings.

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