PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Assembly Plate for use in Constructional Toy

I, ARTUR 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 plate or disc for assembly with small building bricks, preferably of a resilient synthetic material, each of the bricks being provided with at least one re-entrant tenon for engagement with a suitably shaped groove in an adjacent component.

According to the present invention there is provided an assembly plate, for use in a constructional toy together with interlocking building bricks having re-entrant connecting tenons and corresponding re-entrant grooves or slots, each face of the plate having a plurality of elongated openings which extend inwardly from the periphery of the plate, an inward part of each opening in the plate being undercut so that it can interlock with a correspondingly shaped tenon of a building brick, and a part of each opening adjacent the periphery of the plate being of substantially constant width corresponding to the widest dimension of the undercut part of the opening, the position of each opening on one face of the plate coinciding with the position of a corresponding opening on the opposite face of the plate. Preferably corresponding pairs of openings communicate to form slots which extend from one face of the plate to the opposite face. A tenon of a building brick can engage a slot in the plate from either side of the plate, as it can be arranged in the widened part of an opening when at right-angles to the plate and then slid along and into the other part of the opening, to interlock with its undercut mouth. The slots may also serve to receive connecting rods inserted into the edge of the plate.

Furthermore, the central portion of the plate or disc may also be provided with bores and apertures for receiving elements, such as connecting rods, and/or with projecting tenons for engagement with slots or grooves of associated building bricks.

In the case of rectangular plates the slots may be provided along the sides. The centre portion of the plate may be provided with tenons, bores or other apertures so that here, to, additional bricks or connecting elements may be fitted.

The advantage in this construction is that, by means of connecting rods to be inserted in the groove cavities, a plurality of assembly plates may be joined to one another, either end to end or at right angles, with sufficient rigidity to allow bulky constructions to be mounted on such base plates.

Preferably the assembly plate is formed of tough, resilient synthetic plastics material, such as polyamide.

An assembly disc according to the invention may have a peripheral groove to enable it to be used as a pulley. The groove may be round, angular or frusto-conical.

Finally, it should be mentioned as another feature that the thickness of the assembly plate may correspond to the full length of one tenon or the length of two half-length tenons associated with bricks. This enables flush mounting even of two discs in which bricks have been inserted.

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

Fig. 1 is a plan view of an assembly plate in the shape of a round disc, with a brick and a connecting rod radially attached;

Fig. 2 is a side view of the disc shown in Fig. 1, with the portion indicated by the line II—II shown in section;

[*Price 4s. 6d.*]

Price 25p

Fig. 3 is a part-sectional side elevation of the disc of Fig. 1 along the line III—III;

Fig. 4 is a plan view of a rectangular assembly plate;

Fig. 5 is a part-sectional side elevation of the assembly plate of Fig. 4 with attached bricks;

Fig. 6 is an elevation of the assembly plate of Fig. 4 from one end, also showing attached bricks;

Fig. 7 is a plan view, partly in section of a further embodiment of assembly disc, and

Fig. 8 is a side elevation, partly in section corresponding to Fig. 7.

Referring to the drawings, Fig. 1 shows a round disc 1 provided with slots 2, extending radially inwardly from the periphery of the disc 1, into which building elements 3 or rods 4 may be inserted, in order to serve as connecting and constructional elements respectively. As shown in Fig. 3, the slot 2 has on one or both sides re-entrant portions 2*a* which can interlock with the corresponding re-entrant tenons 5 of bricks 3, inserted from both sides of the disc, or can frictionally engage the rods 4, inserted radially into the edge of the disc. Slits 6 provided adjacent the slots 2 facilitate deformation of the sides of the slots 2 to compensate for tolerances in building components introduced into the slots 2. In addition, the disc 1 is provided with apertures 9 to enable rods 4 to pass transversely through the disc.

In the case of the assembly plate 7 shown in Figs. 4 to 6, the slots 2, with re-entrant portions 2*a* are arranged in parallel rows along the outer margins of the two longer sides. This enables bricks 3 to be inserted from the edge of the plate and slid towards the centre portion 7*a*. The latter portion 7*a* may be bridged by means of connecting bricks 8, so that practically the entire surface of the assembly plate 7 can be used for the attachment of constructional elements on both sides. This is very important for example for use in the construction of a model vehicle when side walls have to be fitted to the upper side of the plate, and shafts and wheels to its underside.

Additionally, apertures 9, 10 of round and rectangular shape are provided in the centre portion 7*a* of the assembly plate 7 to enable the attachment of additional bricks 3 or rods 4. Alternatively, tenons such as the tenons 5 with re-entrant portions 5′ might be provided. To provide for the end-to-end connection of plates 7, peripheral grooves 11, bores 11′, and slotted bores 11″ are further provided. This makes it possible positively to connect a plurality of assembly plates 7, 7*a* by means of single or double-connections, either end to end or at right angles.

Thus, the assembly plate of the invention provides for the attachment of constructional elements on both sides, as well as the joining of other assembly plates.

The provision of re-entrant portions 2*a* of the slots 2 on both sides of the plate 7 is of special advantage if the bricks have suitably shaped tenons 5′ which allow them to be assembled either in exact end-to-end opposition or in such a way that the tenons can slide past one another, inside the same slot (see Fig. 5).

Referring to Figs. 7 and 8, the assembly disc 21 is provided with marginal inwardly extending re-entrant slots 22 22*a*, in which bricks or rods (not shown) may be introduced to serve as connecting or constructional elements. The apertures 23 allow rods or similar elements to be inserted transversely through the disc. The central aperture 24 allows attachment of the disc 21 to a suitably shaped hub or shaft.

The disc 21 is also provided with a peripheral groove 25 whose cross section may be semi-circular, angular or frusto-conical. This construction allows the disc 21 to be used as a pulley.

WHAT I CLAIM IS:—

1. An assembly plate, for use in a constructional toy together with interlocking building bricks having re-entrant connecting tenons and corresponding re-entrant grooves or slots, each face of the plate having a plurality of elongated openings which extend inwardly from the periphery of the plate, an inward part of each opening in the plate being undercut so that it can interlock with a correspondingly shaped tenon of a building brick, and a part of each opening adjacent the periphery of the plate being of substantially constant width corresponding to the widest dimension of the undercut part of the opening, the position of each opening on one face of the plate coinciding with the position of a corresponding opening on the opposite face of the plate.

2. An assembly plate as claimed in claim 1 in which corresponding pairs of openings communicate to form slots which extend from one face of the plate to the opposite face.

3. An assembly plate as claimed in claim 1 or 2 in which the central portion of the assembly plate is provided with apertures for receiving constructional elements, and/or with projecting tenons for engagement with slots or grooves of associated building bricks.

4. An assembly plate as claimed in claim 2 or 3 appended thereto, in combination with one or more building bricks as referred to in claim 1, the thickness of the plate corresponding to the length of a tenon of a building brick so that the tenon can penetrate completely a slot in the assembly plate.

5. An assembly plate as claimed in claim 2 or 3 appended thereto, in combination with one or more building bricks as referred to in claim 1, the length of a tenon of at least one

Fig. 3 is a part-sectional side elevation of the disc of Fig. 1 along the line III—III;

Fig. 4 is a plan view of a rectangular assembly plate;

Fig. 5 is a part-sectional side elevation of the assembly plate of Fig. 4 with attached bricks;

Fig. 6 is an elevation of the assembly plate of Fig. 4 from one end, also showing attached bricks;

Fig. 7 is a plan view, partly in section of a further embodiment of assembly disc, and

Fig. 8 is a side elevation, partly in section corresponding to Fig. 7.

Referring to the drawings, Fig. 1 shows a round disc 1 provided with slots 2, extending radially inwardly from the periphery of the disc 1, into which building elements 3 or rods 4 may be inserted, in order to serve as connecting and constructional elements respectively. As shown in Fig. 3, the slot 2 has on one or both sides re-entrant portions 2*a* which can interlock with the corresponding re-entrant tenons 5 of bricks 3, inserted from both sides of the disc, or can frictionally engage the rods 4, inserted radially into the edge of the disc. Slits 6 provided adjacent the slots 2 facilitate deformation of the sides of the slots 2 to compensate for tolerances in building components introduced into the slots 2. In addition, the disc 1 is provided with apertures 9 to enable rods 4 to pass transversely through the disc.

In the case of the assembly plate 7 shown in Figs. 4 to 6, the slots 2, with re-entrant portions 2*a* are arranged in parallel rows along the outer margins of the two longer sides. This enables bricks 3 to be inserted from the edge of the plate and slid towards the centre portion 7*a*. The latter portion 7*a* may be bridged by means of connecting bricks 8, so that practically the entire surface of the assembly plate 7 can be used for the attachment of constructional elements on both sides. This is very important for example for use in the construction of a model vehicle when side walls have to be fitted to the upper side of the plate, and shafts and wheels to its underside.

Additionally, apertures 9, 10 of round and rectangular shape are provided in the centre portion 7*a* of the assembly plate 7 to enable the attachment of additional bricks 3 or rods 4. Alternatively, tenons such as the tenons 5 with re-entrant portions 5′ might be provided. To provide for the end-to-end connection of plates 7, peripheral grooves 11, bores 11′, and slotted bores 11″ are further provided. This makes it possible positively to connect a plurality of assembly plates 7, 7*a* by means of single or double-connections, either end to end or at right angles.

Thus, the assembly plate of the invention provides for the attachment of constructional elements on both sides, as well as the joining of other assembly plates.

The provision of re-entrant portions 2*a* of the slots 2 on both sides of the plate 7 is of special advantage if the bricks have suitably shaped tenons 5′ which allow them to be assembled either in exact end-to-end opposition or in such a way that the tenons can slide past one another, inside the same slot (see Fig. 5).

Referring to Figs. 7 and 8, the assembly disc 21 is provided with marginal inwardly extending re-entrant slots 22 22*a*, in which bricks or rods (not shown) may be introduced to serve as connecting or constructional elements. The apertures 23 allow rods or similar elements to be inserted transversely through the disc. The central aperture 24 allows attachment of the disc 21 to a suitably shaped hub or shaft.

The disc 21 is also provided with a peripheral groove 25 whose cross section may be semi-circular, angular or frusto-conical. This construction allows the disc 21 to be used as a pulley.

WHAT I CLAIM IS:—

1. An assembly plate, for use in a constructional toy together with interlocking building bricks having re-entrant connecting tenons and corresponding re-entrant grooves or slots, each face of the plate having a plurality of elongated openings which extend inwardly from the periphery of the plate, an inward part of each opening in the plate being undercut so that it can interlock with a correspondingly shaped tenon of a building brick, and a part of each opening adjacent the periphery of the plate being of substantially constant width corresponding to the widest dimension of the undercut part of the opening, the position of each opening on one face of the plate coinciding with the position of a corresponding opening on the opposite face of the plate.

2. An assembly plate as claimed in claim 1 in which corresponding pairs of openings communicate to form slots which extend from one face of the plate to the opposite face.

3. An assembly plate as claimed in claim 1 or 2 in which the central portion of the assembly plate is provided with apertures for receiving constructional elements, and/or with projecting tenons for engagement with slots or grooves of associated building bricks.

4. An assembly plate as claimed in claim 2 or 3 appended thereto, in combination with one or more building bricks as referred to in claim 1, the thickness of the plate corresponding to the length of a tenon of a building brick so that the tenon can penetrate completely a slot in the assembly plate.

5. An assembly plate as claimed in claim 2 or 3 appended thereto, in combination with one or more building bricks as referred to in claim 1, the length of a tenon of at least one

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brick corresponding to half the thickness of the assembly plate, so that two such bricks can be attached to the plate from opposite sides their tenons being accommodated directly opposite one another both in the same slot.

6. An assembly plate as claimed in any one of claims 1 to 5, in which slits are provided in the plate adjacent the said slots, in order to facilitate deformation of the walls of said slots.

7. An assembly plate as claimed in any one of claims 1 to 6, formed of a tough, resilient synthetic plastics material, such as a polyamide.

8. An assembly plate as claimed in any one of claims 1 to 7, in which the plate is circular and is provided with a peripheral groove.

9. An assembly plate as claimed in claim 8, in which the cross section of the groove is frusto-conical.

10. An assembly plate substantially as described herein with reference to Figures 1 to 3 or 4 to 6 of the accompanying drawings.

11. An assembly plate substantially as described herein with reference to Figures 7 and 8 of the accompanying drawings.

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