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PATENT SPECIFICATION

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(72) Inventors ERIK BACH and
JAN RYAA



(54) CONNECTOR FOR TOY BUILDING SETS /

(71) We, INTERLEGO A.G. of 3 Sihlbruggstrasse, CH 6340 Baar, Switzerland, a Company organised and existing under the laws of Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us 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 connector for toy building sets and more particularly to a connector for a connecting rod for use with a building set of the kind described in British Patent No. 866,557.

Such building sets generally consist of hollow box-shaped building elements having a rectangular bottom face and four side walls defining a cavity, the outer face of the bottom being provided with coupling studs. Within the cavity of such elements there may be provided other coupling studs known as secondary projections adapted to co-operate with the primary projections for connecting a pair of adjacent building elements.

Moreover, such building sets may include a variety of other elements such as wheels, pinions, shafts for combining with the standard elements referred to for rotational movement relatively to structures formed by various combinations of the standard elements.

In structures including rotatably disposed parts purporting to simulate mechanical constructions such as power transmissions or the like, it may be desirable to provide additional elements for converting a reciprocating movement into a rotation or vice versa.

The main object of the invention, therefore, is to provide a simple and inexpensive connector which will enable the user of the building set to make constructions including a pivoted connecting rod between a reciprocating and a rotatable element.

According to the present invention, a

connector for pivotal mounting of a connecting rod in a toy building set comprises a bearing housing comprising a hollow, rectangular, open-faced toy building element having a bottom and four walls and a pair of oppositely disposed substantially U-shaped recesses defining a pair of bearings, and a pivotal connecting member comprising a pair of tubular elements disposed at right angles to one another, one of which has a pair of cylindrical spigots extending at either side and engaging in the bearings, and the other of which has a bore for receiving one end of a connecting rod.

A construction in accordance with the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation of a connecting member;

Figure 2 is a bottom view of the member shown in Figure 1;

Figure 3 is a plan view of a bearing housing including bearings for pivotally mounting the member shown in Figures 1 and 2;

Figure 4 is a bottom plan view of the bearing housing shown in Figure 3;

Figure 5 is a side elevation of the same bearing housing;

Figure 6 is a sectional view taken on the line VI—VI of Figure 5; and

Figure 7 is a side elevation showing the use of the connector and a connecting rod for interconnecting a pair of elements mounted for rotational and reciprocating movements respectively.

The connecting member shown in Figures 1 and 2 comprises a pair of tubular elements in the form of sleeves 1 and 2 disposed at right angles to one another. The sleeve 1 is provided with a pair of cylindrical spigots 3 extending laterally from either side with their axes intersecting the axis of the sleeve 1 at right angles. The other sleeve 2 receives one end of a connecting rod 9 as

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shown in Figure 7 and is provided with ribs 2a for engagement with corresponding slits (not shown) in the connecting rod 9.

The spigots 3 of the sleeve 1 can be mounted in a pair of bearings 5a in the housing shown in Figures 3 to 6. In the construction shown in these Figures, the bearing housing comprises a modified standard building element pertaining to the building set, i.e. an open faced block having a square bottom 4c as shown in Figure 4 and two pairs of oppositely disposed side walls 4a and 4b. The modification of this standard element for the present purpose consists in the provision of substantially U-shaped recesses forming the bearings 5a for the spigots 3 of the sleeve 1. These recesses 5a are shown in Figure 3 as provided in a pair of internal walls 5 integral with the bottom face 4c of the housing within the cavity thereof and extending parallel to the side walls 4b or they may be in the side walls 4b.

It will be understood that the upper edges of the side walls 4a will limit the angular movements of the swingable connector 1 and 2 within the housing which in Figure 7 is generally designated as 4. Therefore, if it is desired to enable the connector to swing within an angle of 180° so as to coincide with a plane parallel to the bottom face 4c of the housing, the side walls 4a must be provided with recesses 6 permitting for such oscillations.

As shown in Figures 4, 5 and 6, the bottom 4c of the housing is provided with coupling studs 7 for inter-connecting the housing element with other elements of the building set. More particularly, these projections may be used for connecting one end of a piston rod 11 as shown in Figure 7 by clamping the end of the piston rod in between four studs 7 disposed as shown in Figure 4.

The structure shown in Figure 7 comprises a wheel or disc 10 provided with an eccentrically disposed pivot 8 fitting within the bore 1a of the sleeve 1 of Figure 1, so as to provide for oscillatory movements of the connector 1, 2 relatively to the wheel 10 during rotation. One end of the connecting rod 9 is introduced into the bore of the sleeve 2 and the other end of the connecting rod 9 is introduced into a corresponding sleeve of another similar connector pivotally mounted in a bearing housing 4 which is slidably mounted between a pair of guides 12 for reciprocal

movements relatively thereto by means of the piston rod 11. Thus, with the structure schematically shown in Figure 7, the reciprocal movements of the piston rod 11 provide for rotational movements of the wheel 10 or vice versa.

WHAT WE CLAIM IS:—

1. A connector for pivotal mounting of a connecting rod in a toy building set, the connector comprising a bearing housing comprising a hollow, rectangular open-faced toy building element having a bottom and four walls and a pair of oppositely disposed substantially U-shaped recesses defining a pair of bearings and a pivotal connecting member comprising a pair of tubular elements disposed at right angles to one another, one of which has a pair of cylindrical spigots extending at either side and engaging in the bearings, and the other of which has a bore for receiving one end of the connecting rod.

2. A connector according to Claim 1 in which the bottom face of the bearing housing is square and provided with four cylindrical outwardly projecting coupling studs the diameter of which is substantially equal to the diameter of the cylindrical spigots of the pivotal member.

3. A connector according to Claim 1 or Claim 2 in which the substantially U-shaped recesses are formed in members inside and adjacent opposite side walls of the housing.

4. A connector according to Claim 1 or Claim 2 in which the substantially U-shaped recesses are formed in a pair of oppositely disposed side walls of the bearing housing.

5. A connector according to any one of the preceding claims in which a pair of oppositely disposed side walls of the housing disposed perpendicularly to the plane of movement of the pivotal connecting member are provided with recesses for enabling the connecting member to move into its extreme positions.

6. A connector for pivotal mounting of a connecting rod in a toy building set substantially as described and as illustrated with reference to the accompanying drawings.

For the Applicants:—
GILL, JENNINGS & EVERY,
Chartered Patent Agents,
53/64 Chancery Lane,
London, WC2A 1HN.

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It will be understood that the upper edges of the side walls 4a will limit the angular movements of the swingable connector 1 and 2 within the housing which in Figure 7 is generally designated as 4. Therefore, if it is desired to enable the connector to swing within an angle of 180° so as to coincide with a plane parallel to the bottom face 4c of the housing, the side walls 4a must be provided with recesses 6 permitting for such oscillations.

As shown in Figures 4, 5 and 6, the bottom 4c of the housing is provided with coupling studs 7 for inter-connecting the housing element with other elements of the building set. More particularly, these projections may be used for connecting one end of a piston rod 11 as shown in Figure 7 by clamping the end of the piston rod in between four studs 7 disposed as shown in Figure 4.

The structure shown in Figure 7 comprises a wheel or disc 10 provided with an eccentrically disposed pivot 8 fitting within the bore 1a of the sleeve 1 of Figure 1, so as to provide for oscillatory movements of the connector 1, 2 relatively to the wheel 10 during rotation. One end of the connecting rod 9 is introduced into the bore of the sleeve 2 and the other end of the connecting rod 9 is introduced into a corresponding sleeve of another similar connector pivotally mounted in a bearing housing 4 which is slidably mounted between a pair of guides 12 for reciprocal

movements relatively thereto by means of the piston rod 11. Thus, with the structure schematically shown in Figure 7, the reciprocal movements of the piston rod 11 provide for rotational movements of the wheel 10 or vice versa.

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5. A connector according to any one of the preceding claims in which a pair of oppositely disposed side walls of the housing disposed perpendicularly to the plane of movement of the pivotal connecting member are provided with recesses for enabling the connecting member to move into its extreme positions.

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