BUILDING BLOCK ERECTION KIT INCLUDING DETACHABLE ELECTRIC CONTACT ELEMENT

Artur Fischer, Gruenmettetterstr. 133,
D-7241 Tumlingen, Germany
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ABSTRACT OF THE DISCLOSURE

An erection kit includes a plurality of building blocks having on the respective surfaces thereof either elongated undercut open-ended grooves at least one of which is provided with a wider portion so dimensioned as to receive a coupling head or undercut coupling heads receivably in these grooves through the open ends or through the wider portion of the respective groove. An electrically conductive contact element for conducting electrical energy between a source and a user device is provided which includes a first portion configured so as to be receivable in the respective grooves and a section on the first portion which is receivable in the wider portion of such groove to thereby prevent the first portion from being shifted in the groove, and a connected second portion which projects from an open end of the groove when the first portion is received therein.

BACKGROUND OF THE INVENTION

The present invention relates generally to erecting kits, and more particularly to the type of erecting kit wherein structural elements to be connected are provided either with undercut grooves or with coupling heads receivable in such grooves. Still more specifically, the present invention relates to an electrically conductive element for use in conjunction with such a kit for conducting electrical energy between a source and a user device.

It is well known that the use of erecting kits is of particular interest to a child if the kit enables the child to produce true-to-life constructions. Particularly movable constructions, such as vehicles or the like, stimulate the imagination of children playing with this type of toy. Of course, if a vehicle, that is a user device, is to be capable of moving it must be provided with motive power. This is usually done by providing an electromotor. While it is possible to utilize batteries carried in the vehicle or the like, it is frequently desirable to supply the electrical energy from an external source for various reasons, including the fact that batteries tend to weaken relatively quickly, and also because a child will desire to provide the electrical energy in the manner in which it is supplied in the actual life-size constructions, for instance via a rail and sliding contacts, or the like.

It is of course already known to provide sliding contacts which are connected to the model, that is the vehicle or the like, via specially configured structural elements. However, because of their special nature, these specially configured structural elements have only a single use, namely to connect the sliding contacts to the mobile model and cannot be used for anything else. Naturally, this increases the complexity of the construction kit, and accordingly the expense therefore without, however, providing true versatility because this special structural elements have only a single purpose. Another disadvantage of this type of arrangement is that it is frequently difficult to add the sliding contacts to a completed or nearly completed model, often necessitating the removal of individual structural elements or entire groups of such structural elements making up the model, so that the sliding contact can be secured to the model, that is so that it is possible to add the specially configured structural element which in turn will hold the sliding contact on the model. Of course, this adversely influences the interest with which the child approaches playing with the building kit.

It is thus a general object of the present invention to overcome these disadvantages.

More particularly it is an object of the present invention to provide, in an erecting kit of the type under discussion, an electrically conductive contact element for conducting electrical energy between a source and a user device which is considerably simpler and more versatile than what is presently known in this field.

The contact element according to the present invention is not to influence, or to influence only to the minimum possible extent, the versatility of connection between the structural elements of the erecting kit.

Further, this contact element is to provide reliable electrical contact with the source even if the spacing between the element and the source changes.

SUMMARY OF THE INVENTION

In accordance with the above object, and others which will become apparent hereafter, I provide, in an erecting kit of the type including a plurality of structural elements each having a plurality of surfaces, at least some of such surfaces of at least some elements being provided with undercut projecting coupling head and at least some surfaces of at least some elements being provided with complementarily undercut open-ended grooves of which at least one on each element so provided includes an insertion aperture having a cross-section so dimensioned as to permit insertion of a coupling head normal to the elongation of the groove, the improvement which consists in the provision of an electrically conductive contact element for conducting electrical energy between a source and a user device. My novel contact element includes a first portion configured so as to be receivable in the groove having the insertion aperture and this first portion includes a section receivable in this aperture. A connected second portion projects from an open end of the groove when the first portion is received therein.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a somewhat diagrammatic illustration showing a structural element with the electrically conductive element according to the present invention secured thereto; and

FIG. 2 is a longitudinal section through the electrically conductive element of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a structural element in form of a building block or the like, which is provided on some of its surfaces with longitudinally extending undercut grooves 2. Adjacent the end face 3 these grooves are provided with inserting apertures 4 so dimensioned that an undercut coupling head, configured complementarily to the cross-sectional configuration of the grooves 2, and provided on another building block, can be inserted
through these apertures 4 into the grooves 2 so as to connect the (nonillustrated) other building block with the one shown. Such a construction is shown in more detail in my U.S. Pat. No. 3,479,763, which issued from copending application Ser. No. 514,165, filed Nov. 8, 1965 and entitled “Assembly Kit.” Reference may be had to this application for further details concerning the coupling heads and the undercut grooves.

The end face 3 is also provided with an undercut groove 5 corresponding to the grooves 2 and having open ends communicating with the inserting apertures 4 of two of the grooves 2, as shown.

As illustrated, the novel electrically conductive element 6 according to the present invention is inserted into the groove 5. This element 6 is shown in detail in FIG. 2, where it will be seen to consist of a contact portion 7 and a securing or mounting portion 8. The latter consists of two sections, identified with reference numerals 9 and 10. The cross-sectional configuration of the section 9 corresponds to the cross-sectional configuration of the undercut grooves 2 and 5, whereas the cross-sectional configuration of the section 10 corresponds to the cross-sectional configuration of the undercut portion or inserting apertures 4 provided in the grooves 2. A transverse bore 11 is provided in the section 9 so that a connector, a cable or the like can be secured to the element 6 by insertion into the bore 11. This bore may extend transversely to the longitudinal axis of the element 6, or it may extend longitudinally of the latter.

The portion 8 is provided with a longitudinal bore or recess 12 into which the contact portion 7 is telescoped. An expansion spring 13 is also received in the bore 12 urging the portions 7 and 8 apart to their maximum extended position, a suitable abutment being provided to prevent the portion 7 from completely moving out of the bore 12.

Any electrically conductive material is suitable for the construction of the element 6.

It will be appreciated that by inserting the element 6 into one of the grooves as shown in FIG. 1, abutment of the section 10 with the shoulders bounding the insertion apertures 4 will prevent shifting of the element 6 in the groove, that is undesired insertion of the element into the groove to such an extent that the portion 7 would no longer extend outwardly beyond the surface of the building block or structural element. Of course, if a building block constitutes a part of a vehicle or other mobile object constructed with the erecting kit, then the portion 7 may contact a rail or the like through which electrical energy is supplied. Because of the spring-loaded construction of the element 6 it is immaterial whether there are variations in the spacing between the building block to which the element 6 is secured, and the rail or the like because the spring-loaded element 6 will compensate for such variations and will reliably maintain good electrical contact. Of course, the element 6 may be inserted into one of the grooves 2, if desired, rather than into the groove 5. In this case it may for instance be used for electrically connecting shafts or axles received in similar grooves provided in a plurality of longitudinally connected ones of the structural elements, whose grooves 2 carrying these shafts or axles are longitudinally aligned with one another.

Regardless of how the element 6 is utilized, however, it will be appreciated that the contact portion 7 of the element 6 projects only beyond one surface, either a lateral surface or an end face of the respective structural element 1 is secured, so that other structural elements may be connected with this one structural element at all others of the surfaces thereof without interference by the element 6. Of course, it will also be understood that the telescopic construction illustrated in the drawing is not absolutely necessary and that the portions 7 and 8 could also be of one-piece construction. However, I currently prefer the construction as it is illustrated in the drawing because of its greater versatility.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in an erecting kit, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is:

1. In an erecting kit of the type including a plurality of structural elements each having a plurality of surfaces, at least some of such surfaces of at least some elements being provided with undercut projecting coupling heads and at least some surfaces of at least some elements being provided with complementarily undercut open-ended grooves of which at least one on each element so provided includes an insertion aperture having a cross-section so dimensioned as to permit insertion of a coupling head normal to the elongation of the groove and registering with said groove to form a passage therewith, the improvement consisting in the provision of an electrically conductive contact element having means for conducting electrical energy between a source and a user device, including a first portion configured so as to be receivable in said aperture and a second portion projecting from a connected second portion projecting from an open end of said passage when said first portion is received therein.

2. In an erecting kit as defined in claim 1, one of said portions of said contact element being telescoped into the other.

3. In an erecting kit as defined in claim 2, said one portion being telescopically movable with reference to said other portion between a fully projecting position and a partly projecting position; and further comprising biasing means urging said one portion to said fully projecting position.

4. In an erecting kit as defined in claim 3, said biasing means comprising an expansion spring received in said other portion and abutting against an inner end of said one portion.

5. In an erecting kit as defined in claim 2, both of said portions being of substantially rod-shaped configuration.

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