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(54) GEAR WHEEL FOR TOY BUILDING SETS

(71) We, INTERLEGO A.G., a Company organised and existing under the laws of Switzerland, of 3 Sihlbruggstrasse, CH 6340 Baar, 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 gear wheels for toy building sets and more particularly to the shaping of the teeth of such gear wheels.

It is well-known that in gear systems for power transmission different types of gear wheels are required, according to whether the shafts of the gear system are parallel to one another or are disposed at right angles to one another. In the first case, the teeth must generally be arranged so as to extend radially from the gear wheels whereas in the second case bevelled or conical teeth must be used. In industrial power transmissions, this requirement is indispensable in order to secure correct meshing of the gear wheels.

On the other hand, when making gear wheels for toy building sets, it is not strictly necessary to comply with such requirements for ideal meshing or maximum efficiency of the transmission. In fact it is generally considered to be much more important to provide gear wheels of simple and inexpensive construction, for example in the form of mouldings of plastics material, which can be used in gear transmissions irrespective of whether the shafts of the gear wheels are disposed parallel to one another or at right angles even if the theoretical requirements referred to are not fulfilled, provided that the toy gears will operate satisfactorily.

The invention is based on the idea of providing a gear wheel for toy building sets, the teeth of which are shaped and arranged in such a manner that the same gear wheel can be used for both purposes, i.e. for transmission of rotational movement from one shaft to another, whether the shafts are parallel or perpendicular to one another. Thus, in accordance with the invention an element for a toy building set comprises a gear wheel formed by a moulding of plastics material, and having a rim of radially disposed teeth for meshing with corresponding teeth in an adjacent gear wheel having a parallel axis, and wherein the form of each tooth is such that an axial section thereof is defined by a generally triangular portion extending in the axial direction of the gear wheel from a radially extending portion which is curved over its surface opposite to that from which the triangular portion extends, whereby the teeth are shaped for meshing with radially disposed teeth of an adjacent gear wheel having a perpendicular axis.

Such a gear wheel will now be described with reference to the accompanying drawings, in which:—

Figure 1 represents a top view of a gear transmission including a gear wheel according to the invention;

Figure 2 is a side elevation of the same gear transmission; and

Figure 3 is an enlarged axial section showing the characteristic shape of one of the teeth of the gear wheel.

Referring to Figures 1 and 2 of the drawings, there is shown a gear transmission including three gear wheels, A, B and C all provided with normal, radially extending teeth 1, the wheels B and C being of normal well-known construction, whereas the wheel A is a gear wheel according to the invention having radially extending teeth 1 provided with projections 2 extending in the axial direction of the gear wheel A. These projections 2 are shaped to engage—if not perfectly at least sufficiently—with the normal radial teeth 1 of the adjacent wheel B, the axis *b* of which is perpendicular to the axis *a* of the gear wheel A. At the same time, the radially disposed teeth of the gear wheel A mesh with the radially disposed teeth 1 of the other standard gear wheel C, the axis *c* of which is parallel to the axis of the gear wheel A.

The corresponding shafts of the three gear wheels A, B and C are designated as 3A, 3B and 3C respectively.

5 The characteristic shape of the teeth of the gear wheel A which enables this gear wheel to function in the desired manner, i.e. both as a normal pinion and as a crown wheel, transmitting rotational movement from the shaft 3A to the shafts 3B and 3C is shown more clearly in 10 Figure 3. It will be observed that the projecting portion 2 is conical in shape and together with the main body 1 of the tooth defines a shape, having an outline somewhat similar to the 15 profile of a bird's head. When seen in section the axially extending portion 2 is triangular and the radially extending portion from which it projects has a curved surface opposite the 20 portion 2. The gear wheel can be moulded without difficulty from plastics material.

20 WHAT WE CLAIM IS:-

1. An element for a toy building set comprising a gear wheel formed as a moulding of

plastics material, and having a rim of radially disposed teeth for meshing with corresponding teeth in an adjacent gear wheel having a parallel 25 axis, and wherein the form of each tooth is such that an axial section thereof is defined by a generally triangular portion extending in the axial direction of the gear wheel from a radially 30 extending portion which is curved over its surface opposite to that from which the triangular portion extends, whereby the teeth are shaped for meshing with radially disposed teeth of an adjacent gear wheel having a 35 perpendicular axis.

2. A gear wheel for toy building sets substantially as described and as illustrated in the accompanying drawings.

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