The present invention relates to a building block toy set of the type comprising generally cube-shaped elements which are connectible with each other to form a variety of differently shaped structures.

In some toy sets of the general kind indicated, the elements comprise solid blocks provided with recesses or blind holes in all six sides thereof for receiving separate pins or plugs interconnecting the elements. In other known varieties said recesses are in the form of bores which extend all the way through the elements on the three principal axes thereof. These forms of building block toy sets are wasteful of material and have the additional disadvantage that the separate pins easily become lost.

Other toy sets of the general type indicated comprise hollow elements which, however, usually are composed of at least two parts secured together. Although these embodiments represent a savings of material as compared with the solid elements, the manufacturing cost is high.

Also, the connecting pins are generally of small diameter and of a length merely corresponding to twice the wall thickness of the hollow elements which makes for unsatisfactory connection between the elements and undue wear of the pins and elements.

The present invention eliminates the above-mentioned, and other, disadvantages by providing a building block toy set which requires a minimum of material and is inexpensive to manufacture, yet satisfies high requirements as to strength, durability and effective connection between the elements without loss of variety in respect of combination possibilities.

To this end, an object of the invention is to provide a building block toy set of the general type indicated which comprises a plurality of tubular elements, each consisting of a tubular element of square cross-section having open ends spaced apart a distance substantially equal to the side of the square cross-section, thus constituting a substantially cube-shaped block. A socket extends inwardly from each side surface of said tubular element concentrically with the central perpendicular axis of the respective side surface and has a wall thickness substantially equal to that of the tubular element.

Another object of the invention is to provide a building block toy set of the kind indicated in which a first number of said tubular elements each has a centrally located passage therethrough from end to end of each tubular element, a second number of said tubular elements each has a hollow socket pin extending centrally therethrough from end to end of the tubular member and being provided with an extension at each end of a length at least equal to the diameter of said socket pin, and a third number of said tubular elements each has one end formed as an end of said first number of tubular elements and the other end formed as an end of said second number of tubular elements, each of said socket pin extensions fitting into the passage of a corresponding hollow socket pin.

A further object of the invention is to provide a building block toy set of the kind indicated in which the hollow socket pins are provided with a longitudinal slot that extends from their free end to the vicinity of the pin root.

Still another object of the invention is to provide a building block toy set of the kind indicated which includes plate-like cover elements of uniform thickness for closing the open ends of said tubular elements, and shoulders in said tubular elements set back from the ends thereof by the amount of said thickness.

Other objects and advantages of the invention will be apparent from the following description of an embodiment thereof in conjunction with the accompanying drawings, in which—

FIG. 1 is a longitudinal section through a plurality of assembled elements,

FIG. 2 is an elevation of one of said elements with a portion of one side cut away,

FIG. 3 is a top plan view of the element shown in FIG. 2, and

FIG. 4 is a perspective view of an exemplary structure assembled from elements shown in FIGS. 1 to 3.

The building block toy set comprises any desired number of tubular elements of three different types, designated A, B and C, respectively. Each such element is made in one piece from thermoplastic material by a die-casting process. Each is tubular in shape with a square cross-section and has a length between its ends equal to the side of the square cross-section, thus forming a cube-shaped block, as shown. Extending inwardly from each of the four side surfaces of the element there is a socket which is concentric with the central axis X or Y, respectively, thereof. Said sockets 3 are cylindrical blind recesses having a tubular wall 4 the thickness of which is substantially equal to that of the side walls 1 so that a tube-wall cross structure is formed within the tubular element, as clearly shown in FIG. 3.

Up to this point, the elements of types A, B and C are substantially identical. In each of the elements A there is at each end a longitudinal central projection 5 which extends from the above-mentioned cross structure outwardly to the level of the respective end 2 of the element. A central passage 6 extends through said projections 5 and also through the cross structure in which said passage 6 is separated from the sockets 3 by walls 7.

In the tubular elements B a hollow socket pin 8 extends from the cross structure outwardly at both ends of the element and projects beyond the end surfaces a distance 9 that is at least as great as the diameter of the projecting portion of the socket pin 8. Said diameter 9 is somewhat less than that of the inner portion of the socket pin 8, so that an annular shoulder 9 is formed in the plane of the end surface 2. The hollow cylindrical space 10 within the socket pins 8 extends continuously through the cross structure and is separated from the sockets 3 by walls 11.

In the tubular elements C there is at one end a central projection 12 which corresponds to the projections 5 of the elements A and extends inwardly through the cross structure where its recess 14 is separated from the sockets 3 by walls 15. At the other end of the element C there is a socket pin 13 which corresponds to the socket pins 8 in the elements B. The hollow interior 16 of said socket pin 13 communicates with the recess 14. The socket pin 13 has an external shoulder 19 corresponding to the shoulders of the socket pins 8.

In the elements B and C the socket pins 8 and 13, respectively, are preferably provided with a longitudinal slot 17 which extends from the free end of the pin to the vicinity of the inner end of the socket pin.

The diameter of the protruding portion of the socket pins 8 and 13 is slightly larger than the diameter of the sockets 3 and 14, so that thanks to the resilience of the socket pins 8 and 13 which is appreciably increased by the longitudinal slots 17, there is obtained a good frictional engagement that will be maintained even after prolonged use. Through the central space 10 or 16 and the slot 17 in the pins 8 and 13 air may escape from the sockets 3 and 14 when the elements are being assembled.

In addition to the tubular elements A, B and C, the...
toy set also includes a plurality of plate-like cover elements D which are square in contour and of uniform thickness. Said cover elements D fit snugly in the ends of the elements A, B, C where they are supported with their outer surface flush with the end surfaces 2 by interior corner projections 19 in the elements A, B, C which form shoulders 18 at a distance from the end surfaces 2 that is equal to the thickness of the cover elements D. Other shoulders 20 for supporting the cover elements D are formed on the outer circumference of the projections 5 of the elements A and the projections 12 of the elements C. A central hole 21 in each cover element D fits snugly on the end portion of the projections 5, 12 outside of the shoulder 20. The shoulders 20 could, of course, be replaced by shoulders similar to the shoulders 18 formed on projecting ribs (not shown) on the outside of the projections 5, 12.

In an obvious modification (not shown) the cover element D could be made without the central hole 21 in which case the projections 5, 12 would be made shorter by an amount equal to the thickness of the cover element D. Various other modifications within the scope and spirit of the appended claims will be apparent to those skilled in the art.

What I claim is:

1. In a building block toy set, a plurality of equi-sized blocks of thermoplastic die-cast material, each comprising a tubular element of square cross-section and having open ends spaced from each other a distance substantially equal to the side of the square cross-section, a socket extending inwardly from each side surface of said tubular element concentrically with the central perpendicular axis of the respective side surface and having a wall thickness substantially equal to that of the tubular element, a first number of said tubular elements each having a centrally located passage therethrough from end to end of each tubular element, a second number of said tubular elements each having a hollow socket pin extending centrally therethrough from end to end of the tubular member and being provided with an extension at each end of a length at least equal to the diameter of said socket pin, and a third number of said tubular elements each having one end formed as an end of said first number of tubular elements and the other end formed as an end of said second number of tubular elements, each of said socket pin extensions fitting snugly in any one of said sockets and passages.

2. A toy set as set forth in claim 1, in which the hollow socket pins are provided with a longitudinal slot that extends from their free end to the vicinity of the pin root.

3. A toy set as set forth in claim 1, including plate-like cover elements of uniform thickness for closing the open ends of said tubular elements, and shoulders in said tubular elements set back from the ends thereof by the amount of said thickness.

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