June 7, 1960 R. G. DUGGAR 2,939,243

MAGNETIC TOY BUILDING BLOCKS

Filed Aug. 8, 1957

Fig. 1.

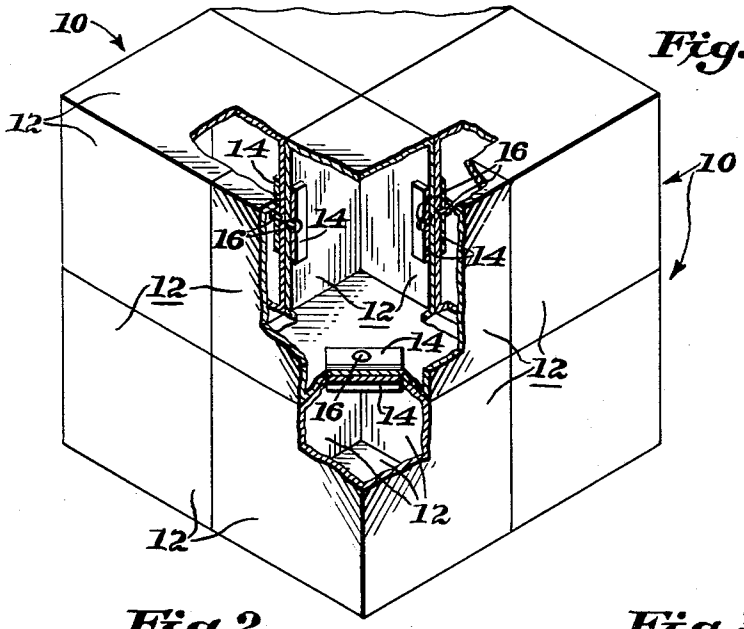


Fig. 2.

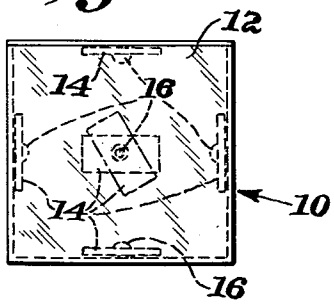


Fig. 3.

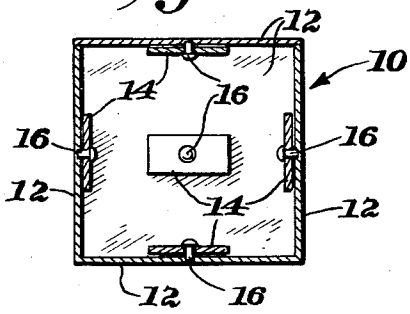
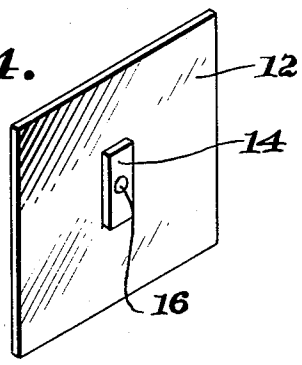


Fig. 4.



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MAGNETIC TOY BUILDING BLOCKS

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3 Claims. (Cl. 46—24)

This invention relates to toys and more particularly to toy building blocks having means embodied therein for removably securing the same together.

It has been proposed to provide conventional toy building blocks with permanent-type magnets fixedly secured to the faces or sides thereof, which magnets serve to hold the blocks together in addition to the force of gravity normally utilized in assembly. With permanent magnets fixed with respect to each side or face of the building block, each face will have either a fixed positive or negative attraction. It is, therefore, impossible to construct such blocks so that no matter what two faces of any two blocks are placed together, the magnets will serve to attract each other and, hence, hold the blocks together. That is, eventually, in arranging blocks having fixed magnets therein, two faces will be brought into engagement having similar attraction potentialities, either negative or positive, so that the magnets rather than serving to hold the blocks together, will tend to move the same apart. Thus, the prior art blocks having fixed magnets embodied therein are definitely limited in the manner in which they can be utilized.

It is an object of the present invention to provide a set of toy building blocks having permanent-type magnets disposed in the faces or sides thereof so that when any two sides of any two blocks of the set are brought into abutting engagement, the associated magnets will serve to retain the same in abutting relation by magnetic attraction.

Still another object of the present invention is the provision of a toy building block of the type described having permanent magnets mounted adjacent each face thereof for movement about an axis intermediate the poles thereof and in a plane generally parallel with the associated face so that the same can be moved into a position so that the poles will correspond and attract a like magnet embodied in a like block.

Still another object of the present invention is the provision of a building block of the type described having improved means for mounting the magnets for free rotational movement so that they will automatically align themselves with corresponding magnets of like blocks to attract such magnets and thereby releasably secure the two blocks together.

Still another object of the present invention is the provision of a building block of the type described which is simple in construction and operation and economical to manufacture and maintain.

These and other objects of the present invention will become more apparent during the course of the following detailed description and appended claims.

The invention may best be understood with reference to the accompanying drawings wherein an illustrative embodiment is shown.

In the drawings:

Figure 1 is a perspective view illustrating a plurality of toy building blocks embodying the present invention showing the same in cooperating relation;

Figure 2 is a top plan view of one of the building blocks;

Figure 3 is a central vertical sectional view of the block shown in Figure 2; and

Figure 4 is a perspective view illustrating one side wall of the building block and its associated magnet.

Referring now more particularly to the drawings, the present invention comprises a building block, generally indicated at **10**, which may be made of suitable construction or configuration, but, as shown, is preferably made of suitable plastic material or the like into a cube configuration. The block comprises a plurality of relatively thin square-shaped walls **12** which may be secured together by any suitable means, such as cement or the like. As shown, five of the walls are made integral as by a casting or molding operation and the sixth wall is made separate and subsequently cemented or glued onto the edges of the four abutting walls.

As best shown in Figure 4, each wall **12** has a magnet **14** of the permanent bar type mounted on the adjacent interior surface thereof for rotation about an axis intermediate the poles of the permanent magnet and in a plane parallel and closely adjacent to the associated wall. Any suitable means may be provided for effecting this rotary movement and, as shown, a headed pin **16** is utilized which is suitably secured to the center of the associated wall and extends inwardly to receive the magnet. The magnet is preferably mounted on the pin between the inner surface of the side wall and the head of the pin so that it may freely rotate about the axis of the latter.

In operation, it will be understood that a set of blocks **10**, each constructed as indicated above, is provided so that they may be assembled into various desired arrangements. It will be noted that when any two sides or faces of any two blocks of the set are brought into abutting relation, the associated magnets, due to their polarity, will rotate into a position in which the negative pole of one is aligned with the positive pole of the other and vice versa. The magnets are disposed only a slight distance from the exterior surface of the sides so that when two sides of two blocks are in abutting engagement, there is sufficient strength in the magnetic field between the two magnets to effect movement in the event that they are not properly aligned. As shown in Figure 1, it will be noted that any desired arrangement of the blocks can be utilized and the magnets of the blocks will automatically align themselves to attract each other due to their rotary mounting, irrespective of the original disposition of the magnets therein.

While it is preferable to provide the magnets with a rotary mounting which will permit free movement thereof, it is within the contemplation of the present invention to mount the magnets so that they may be moved by hand as well. Moreover, the invention is not restricted to the particular hollow-type block construction illustrated, but other constructions may be utilized as well.

It thus will be seen that the objects of this invention have been fully and effectively accomplished. It will be realized, however, that the foregoing specific embodiment has been shown and described only for the purpose of illustrating the principles of this invention and is subject to extensive change without departure from such principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

I claim:

1. A device of the type described comprising a plurality of relatively thin planar walls defining a hollow block, and a permanent magnet mounted adjacent the interior surface of each of said walls for free rotary movement about an axis extending perpendicular through the

center of the associated wall and intermediate the poles of the associated magnet and in a plane parallel to and closely adjacent the associated wall.

2. A device of the type described comprising a plurality of relatively thin planar walls secured together to form a hollow cube, a pin extending inwardly from the center of each wall, and a permanent straight bar magnet mounted intermediate its ends on each pin for free rotary movement in a plane parallel to and closely adjacent the associated wall.

3. The combination comprising a set of toy building blocks, each block including a plurality of relatively thin planar walls secured together to form a hollow cube, and a permanent magnet mounted adjacent the interior surface of each of said walls for free rotary movement about an axis extending perpendicular through the center

of the associated wall intermediate the pole of the associated magnet and in a plane parallel to and closely adjacent the associated wall, said magnets being of sufficient magnetic strength such that when any two walls of any two blocks of the set are moved into abutting engagement, the associated magnets will be attracted into a position of polar alignment to thereby magnetically retain the walls in abutting relation.

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