United States Patent [19]

Felsten

[11] **3,840,234**

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[54] **AMUSEMENT DEVICE**

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[52] **U.S. Cl.** ..... **273/113**, 273/153 R

[51] **Int. Cl.** **A63d 15/00**

[58] **Field of Search** ..... 273/109, 113, 115, 153 R, 273/153 P, 156; 248/241, 242, 298

[56] **References Cited**

FOREIGN PATENTS OR APPLICATIONS

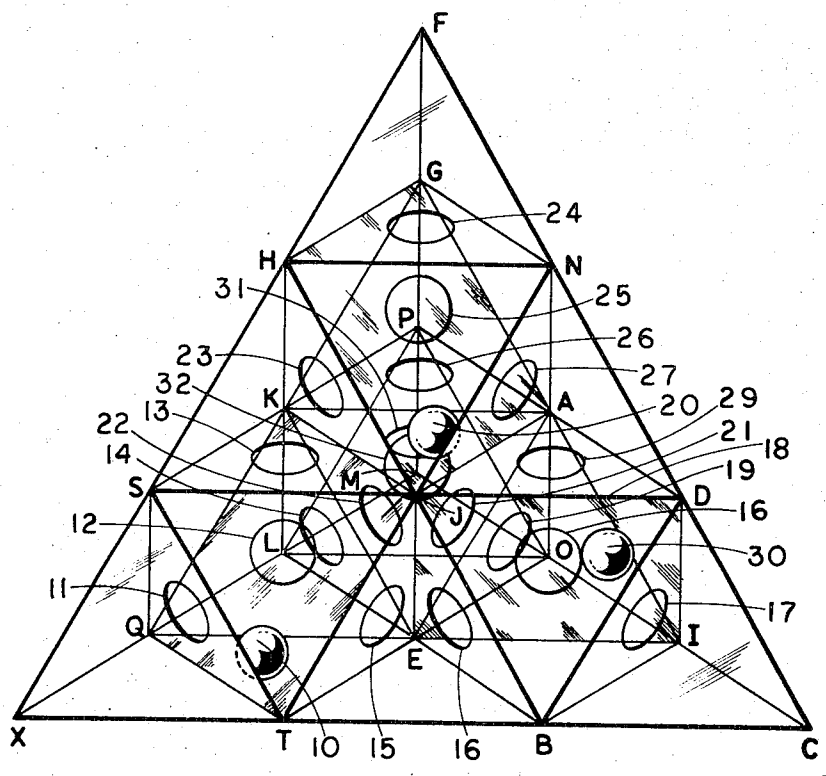
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[57] **ABSTRACT**

A transparent outer or main tetrahedron made of plastic or the like containing a more or less central transparent tetrahedron each of whose four sides is also one of the sides of a respective one of four octahedrons contiguous thereto. The octahedrons are located toward the respective four corners on the interior of the main tetrahedron. Predetermined ones of the sides or faces of the internal octahedrons have central holes formed therein. Each of the four internal octahedrons is bisected by an unapertured transparent planar member which can be seen only with great difficulty. There are three balls within the main tetrahedron and the object of the game is to move the main tetrahedron so that the three balls come to rest in any three corners of the main tetrahedron. The fun (and difficulty) of the game comes in trying to move the balls through the apertured faces of the inner octahedrons and being stymied by the scarcely visible unperforated faces.

11 Claims, 4 Drawing Figures



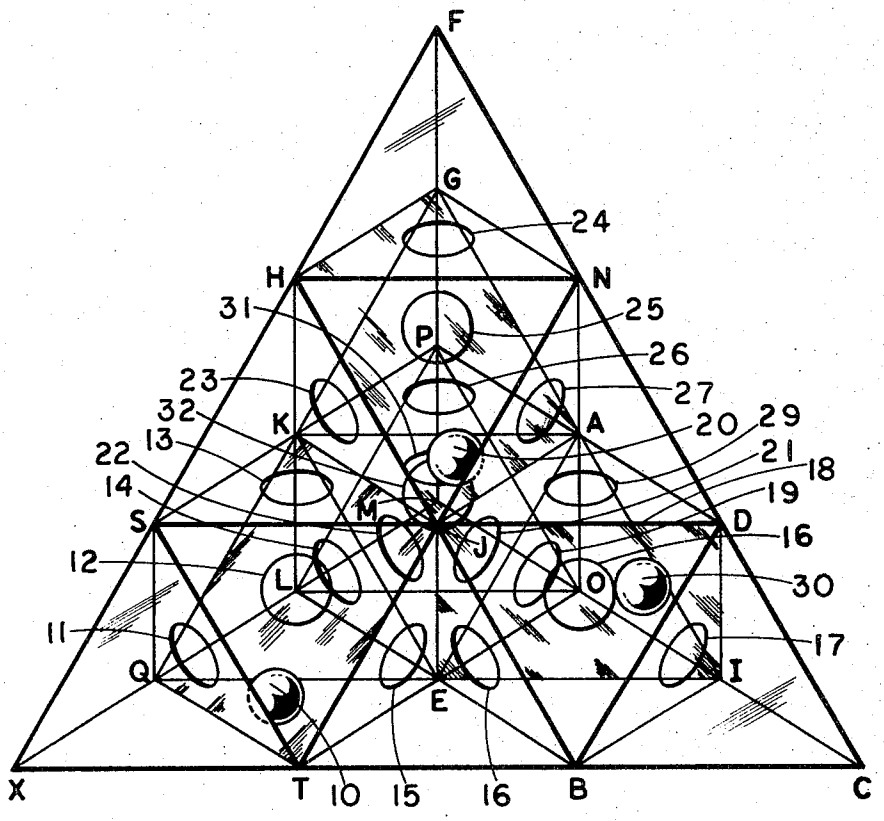


FIG. 1

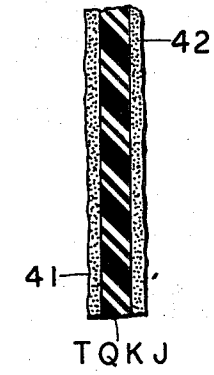


FIG. 4

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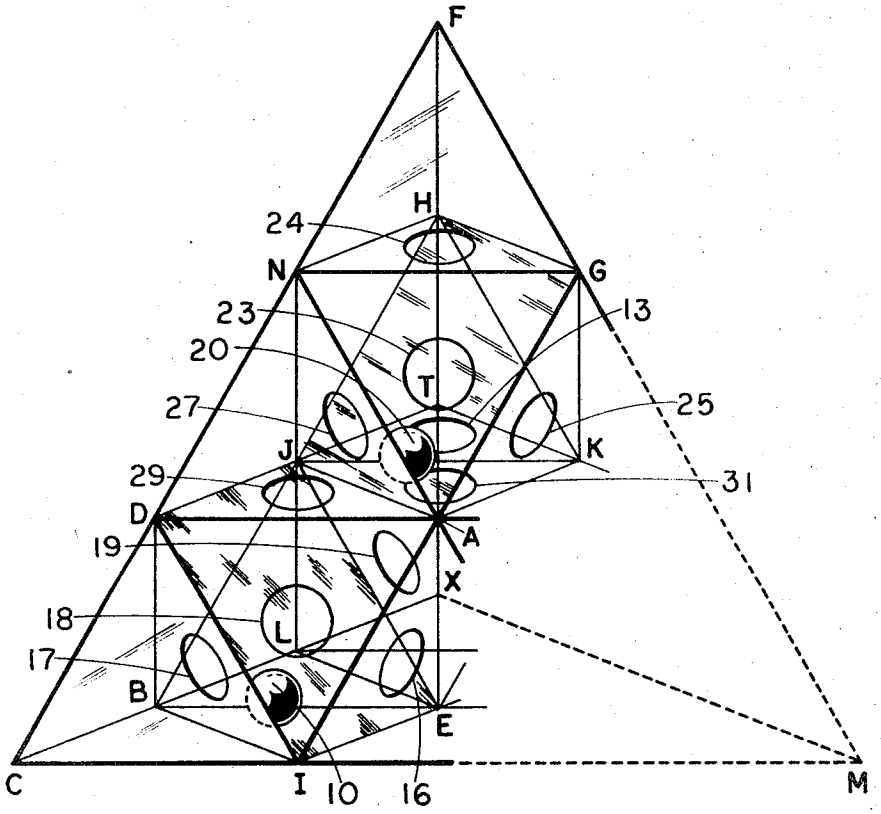


FIG. 2

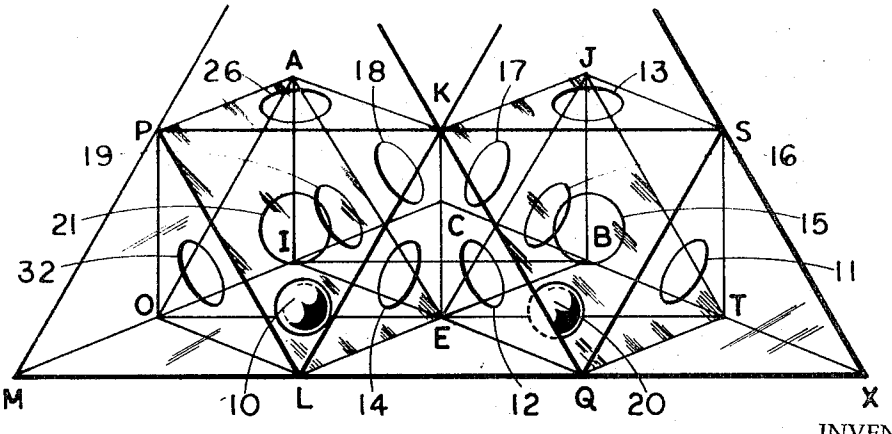


FIG. 3

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AMUSEMENT DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to amusement devices or puzzles and especially to a transparent puzzle in the form of a main polyhedron containing a plurality of balls which are to be located in specified regions within the main polyhedron.

2. Prior Art

There are many amusement devices in which there are a number of compartments and a number of objects or balls which are to be moved to specified ones of these compartments. However, none are known which are practically entirely transparent and in which passage through apertures from some compartments to others is blocked by the presence of an almost invisible barrier.

SUMMARY OF THE INVENTION

An amusement device comprising a primarily transparent housing having a number of primarily transparent compartments and a number of apertures in the walls of those compartments. One or more balls or other playing objects are disposed within the compartments. Some of the compartments are divided by, or have, substantially invisible walls which stymie the player when he attempts to move one of the balls from certain compartments to other compartments.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevation view of the amusement device which is the subject of the present invention.

FIG. **2** is a partial side-elevation view of the device shown in FIG. **1.**

FIG. **3** is a cross-sectional view of an "invisible" barrier that may be used in another embodiment of the present invention.

FIG. **4** is another partial side elevation view of the device shown in FIG. **1.**

DETAILED DESCRIPTION OF THE FIGURES

FIG. **1** shows a view of the amusement device which takes the form of a transparent plastic main tetrahedron FXCM as seen looking toward and through one of its triangular side faces FXC. It also includes faces FCM, FMX and triangular base CMX. Within the device there is a more or less central tetrahedron JAKE having triangular faces JAK, JAE, JKE, and AKE. One of the apices of JAKE is at E which is at the exact center of the lower triangular face XCM of the main tetrahedron. There are four octahedrons contiguous to the central tetrahedron JAKE, each of whose faces is also one face of the surrounding octahedrons. Thus, its face JAE is one of the faces of the octahedron JAE DIB. The face KJE of the central tetrahedron is also a face of the tetrahedron KJETSQ. Similarly, the face AKE of the internal tetrahedron is also the face of the contiguous tetrahedron AKELPO, and the face JAK of the internal tetrahedron is one of the faces of the contiguous tetrahedron JAKHGN.

It should be noted that the bounding planar surfaces of the internal octahedrons, except for those surfaces which are parts of the exterior surfaces of the main tetrahedron are provided with central holes. Thus, octahedron KJETSQ is provided with holes **11, 12, 13, 15** and **22.** Tetrahedron JAEDIB is provided with holes **16, 17, 18, 19,** and **29.**

Internal tetrahedron JAKHGN includes holes **23, 24, 25, 27,** and **31.** Internal tetrahedron AKELPO includes holes **14, 18, 21, 26,** and **32.**

It will also be seen that at each corner or next to each apex of the device there is another tetrahedron. Thus, in FIG. **1** there is a top tetrahedron FHNG at apex F, a tetrahedron SXTQ at apex X, a tetrahedron DBCI at apex C and in FIG. **1** a tetrahedron PMLO at apex M. There are also other volumes in tetrahedron FXCM between the internal octahedrons which are also occupied by tetrahedrons such as tetrahedron IAOE, KLQE, JTBE, GAPK, HKSJ, JDAN, etc.

The device is also equipped with three plastic balls **10, 20** and **30.** One way of playing the game is to try to get the three balls in respective corners of the main tetrahedron, e.g., to get one each in tetrahedrons SXTQ, DBCI, and PMLO. This is done by changing the position of the device so that the balls will roll through the apertured faces into the proper places. However, the player soon finds out, to his chagrin, that his task is made even more difficult by the presence of the "invisible" or almost invisible barrier planes which bisect each of the four internal octahedrons. They are difficult to distinguish because they are transparent, they appear to have their own holes, but the latter turn out to be holes in other faces behind them, they reflect incident light only when the device is held at certain angles with respect to the light source, and they have edges in common with other sides or faces in the device which are contiguous to them.

Octahedron KJETSQ is bisected by unapertured plane KJTQ. The ball **10** is shown on the left side of this plane. Octahedron JAKHGN is bisected by invisible unapertured plane JAGH. Octahedron JAEDIB is bisected by unapertured plane JDIE and octahedron AKELPO is bisected by invisible plane APLE. As stated above, these invisible planes have common edges with other faces or sides in the main tetrahedron and cannot easily be seen. In order to enhance their invisibility, the surfaces of these planes may be coated with any commerically available, clear de-lustrant so that even when the incident light strikes them at certain angles, their reflectivity and hence their detectability will be sharply reduced. As seen in FIG. **3,** the invisible plane TQKJ could have both surfaces coated with layers **41** and **42** of the anti-reflective material, which may, for example, be TiO_2 in a suitable binder.

Other modifications in the structure may also be made. For example, to increase the fun, some of the "invisible" planes may be formed to give the impression that they have central holes: This illustration may be created by scribing congruous circles the size of holes on both sides of the invisible planes. Another way would be to provide that the circular central areas of those planes be lighter in color than the rest of the planes. This could be done by drilling out a central circular area and then replacing it with a lighter, disc-shaped piece of plastic, or by any other known method of forming a sheet of plastic with a disc-shaped central area having a different color than the surrounding area.

Instead of, or in addition to creating the illusion of a hole where none exists, the device can be equipped with planes having holes which are a mite too small to permit passage of one or more of the balls through it.

It should be realized that it is not necessary for the entire device to be transparent. Various ones of the interior planes could be opaque or translucent for special or decorative effects. Also, this is true with the devices external bounding planes, although there should be sufficient visibility to enable the player to move the device or manipulate it without undue visual strain.

The external bounding planes need not completely enclose the interior. They should, however, be so constructed that they do not allow one or more of the balls to unintentionally escape from the device.

Although the invention is shown in the form of a main tetrahedral structure enclosing at least four internal octahedrons and one tetrahedron, it could take many other shapes as well. It could take the form of a cube or other parallelepiped, for example, so long as there are a selected number of "invisible" planes in the internal compartments.

Another form of the invention would be a structure in which there would be a selected number of apparent internal geometric volumes defined by a number of planes, but lacking at least one boundary plane. The absence of the missing plane would be camouflaged by the presence at all of its edge loci of the inside edges of the adjacent boundary planes.

Still other modifications or other embodiments, which do not depart from the essence of the invention, will undoubtedly occur to one skilled in the art upon perusal of the specification and claims herein. Consequently, I desire that the invention be defined solely by the claims as follows.

I claim:

1. An amusement device comprising:

a. a substantially transparent housing,

b. a plurality of substantially identical transparent compartments within said housing, said compartments being polyhedrons having more than six sides bounded by planar walls predetermined ones of which have apertures formed therein,

c. a selected number of apparently invisible, unapertured planar walls dividing selected ones of said compartments, all of the edges of each of said apparently invisible walls being substantially coincident with the adjacent edges of the bounding walls of the compartment it divides.

2. The device according to claim **1** wherein said device is generally polyhedral in shape.

3. The device according to claim **1** wherein said housing is tetrahedral in shape.

4. The device according to claim **1** wherein there are four of said octahedral compartments clustered about a generally central tetrahedral volume whose sides are composed of a side from each of said octahedrons.

5. The device according to claim **1** wherein predetermined surfaces of selected ones of said apparently invisible walls are processed to reduce reflectivity of light therefrom.

6. The device according to claim **1** wherein said playing piece is spherical.

7. The device according to claim **6** wherein there are a plurality of said spherical pieces.

8. The device according to claim **1** wherein one or more of said bounding walls are unapertured but are formed to give the illusion that they have apertures therein.

9. The device according to claim **1** wherein one or more of said apertures are insufficiently large to permit passage of said playing piece.

10. The device according to claim **1** wherein each of said apparently invisible walls bisects the compartment that it divides.

11. The amusement device according to claim **1** with the addition of at least one play piece adapted for movement through said apertures upon manipulation of the device.

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