April 21, 1959 R. E. ROGERS ET AL 2,883,195

CHANGEABLE AMUSEMENT DEVICES AND THE LIKE

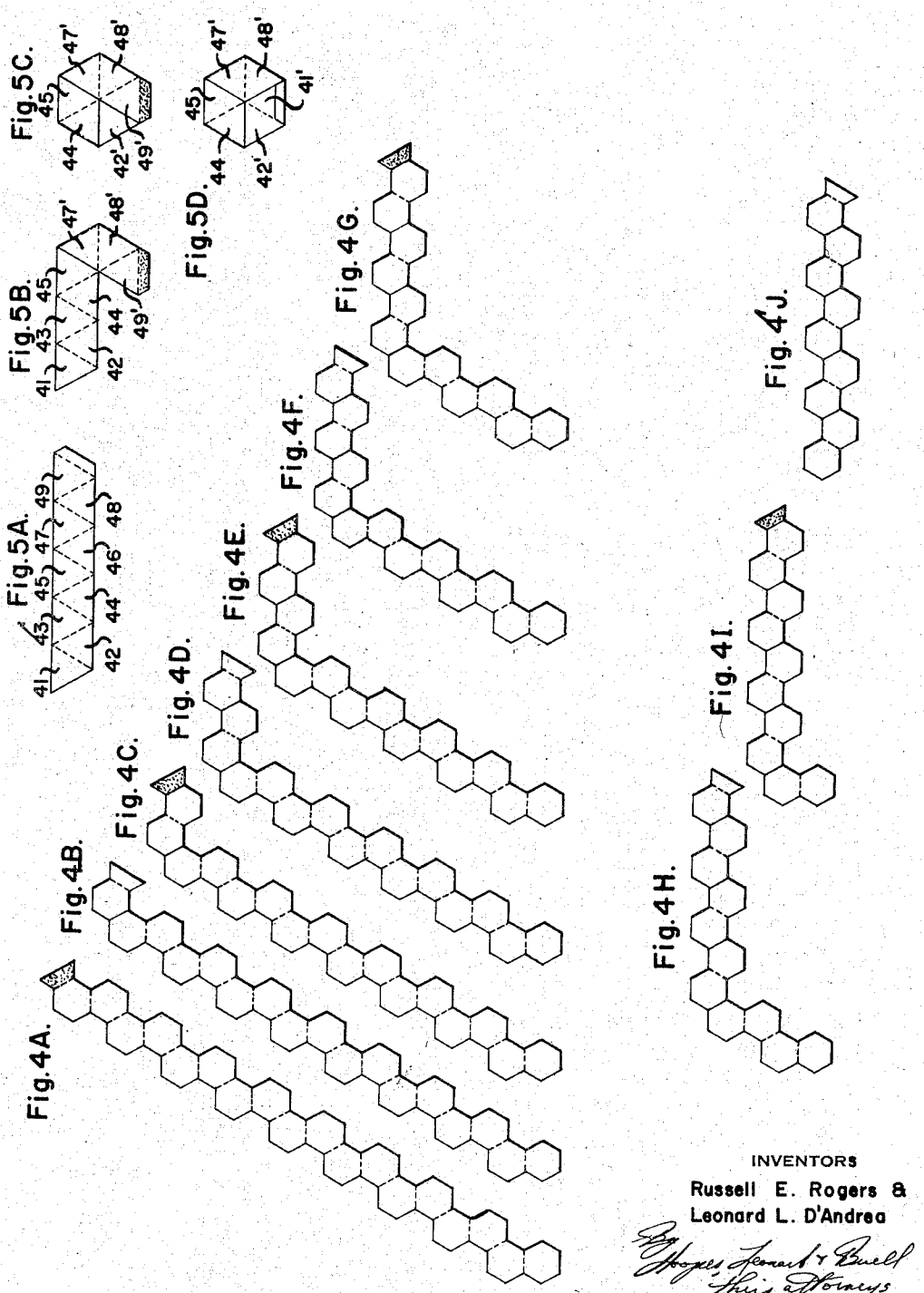
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CHANGEABLE AMUSEMENT DEVICES AND THE LIKE

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8 Claims. (Cl. 273—155)

This invention relates to changeable amusement devices and the like and particularly to a changeable device which may be used as a toy, as an advertising and display device, or as an educational geometric device.

We provide a changeable amusement device which preferably comprises a plurality of identical geometric figures whose angles are 60° angles to form an elongated strip having nine faces on each side, the ends of said strip being folded along the line between each third and fourth face and hingedly connected to form a hexagonal member. Preferably the device is made up of eighteen equilateral triangles folded into connected pairs to form an elongated parallelogram having nine faces on each side, the ends of the strip being folded along the line between each third and fourth triangle and hingedly connected to form a hexagonal member. Preferably the triangles are hingedly connected together along two adjacent sides to form a second elongated parallelogram whose long sides are one half the length of the long sides of the first parallelogram. Preferably each apex of each triangle is provided with a portion of graphic representation so arranged that each set of six apices at the center of the hexagon forms a complete representation. This permits 18 different combinations to be formed at the center of the hexagon as the triangles are moved in a manner hereafter to be described.

The triangles may be formed by folding a strip of paper to produce adjoining equilateral triangles with the fold acting as a hinge. Similarly the triangles may be made of plastic or similar material and fixed to a flexible strip such as nylon which acts as the hinge between them or they may be otherwise hinged or flexibly joined.

We have described certain objects, advantages and purposes of this invention hereinabove. Other objects, advantages and purposes will be apparent from a consideration of the following description and the accompanying drawings in which,

Figures 1A through 1J inclusive show the sequence of steps followed in making the first series of folds used in making a preferred changeable amusement device of this invention.

Figures 2A through 2D inclusive show the sequence of steps followed in folding the parallelogram of paired triangles of Figure 1J into a hexagon as used in making a preferred changeable amusement device of this invention.

Figures 3A through 3C show the method of using the finished article of Figures 1 and 2.

Figures 4 A through J show the sequence of folds for an alternative form of device of this invention.

Figures 5 A through D inclusive show the sequence of folds for a third form of device of this invention.

Referring to the drawings we have illustrated a parallelogram made up of equilateral triangles whose exposed faces (viewing Figure 1A) are **11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28** hingedly connected together along two adjoining edges, as for example, triangle **12** is hinged to triangle **11** and to triangle **13**. A fastening tab **29** is hingedly provided on triangle **28**.

The bottom or unexposed face of the triangles viewing Figure 1A will be given prime numbers for purposes of explanation.

The triangles are folded into pairs as shown in the sequence 1A through 1J to form a parallelogram whose faces are the paired triangles (see 1J). For example, triangle **28** is folded onto triangle **27**, **26** onto **25**, **24** onto **23**, etc. The last three pairs of triangles at each end of the parallelogram are then folded at the hinge between the third and fourth pair in opposite directions as shown in the sequence 2A through 2D. In doing this, paired triangles **28, 27, 26, 25, 24** and **23** are folded so that triangle face **24'** faces triangle face **21'**. Similarly paired triangles **11, 12, 13, 14, 15** and **16** are folded in the opposite direction so that triangle **18'** faces triangle **15'**. This brings triangle **28'** face to face with triangle **11'**. The paired triangles **11** and **12** and **27** and **28** are then transposed to bring triangle face **27'** face to face with triangle face **12'**. The tab **29** is fixed to triangle **11** to complete the hexagon (see Figure 2D) which makes a continuous strip out of the connected triangles surrounding a central point or annulus.

If the triangle faces **26'** and **23'** are grasped between the thumb and forefinger of one hand (see Figure 3A) the triangle faces on the opposite side thereof, **22'** and **25'** will be brought face to face. Pressure on the outer edge of the junction between triangles **14** and **17** will cause the inner edge of junction to move outwardly from the center or annulus **30**.

If this inner edge is grasped (see Figure 3C) and pulled outwardly the triangle faces **13, 14, 19, 20, 25** and **26** will be exposed at the same time the apices of triangle faces **11', 14', 17', 20', 23'** and **26'** which were adjacent the center **30** will be the outside corners of the bottom face. In short, these latter faces will now have taken the position which faces **13', 16', 19', 22', 25'** and **28'** had at the beginning of the operation. By continuing to do this, first through a sequence on one side of the hexagon and then through a sequence on the opposite side of the hexagon, a series of 18 different combinations will appear around the center **30**. By arranging different graphic representations, advertising matter or combinations thereof at the apices of the triangles, it is clear that an intriguing game or toy can be produced having great attraction for both children and adults. Similarly by coloring the faces in varied hues or with geometric designs, a variety of combinations and figures of great interest and complex predictability can be produced.

In Figures 4 A through J we have illustrated an alternative form of our invention in which the corners of the triangles making up the parallelogram are removed to form hexagons. The hexagons are folded in precisely the same fashion as the triangles of Figures 1A through 1J and 2A through 2D. The operation of the resulting device is similar to that illustrated in Figures 3A through 3C.

In Figures 5A through 5D there is illustrated a third embodiment of our invention in which nine equilateral triangles **41, 42, 43, 44, 45, 46, 47, 48** and **49** are folded in the manner illustrated in Figures 1A through 1D. In other words, triangle **47** is folded onto triangle **46**, and triangle **43** is folded so that its reverse face **43'** is facing triangle face **44'** and triangle face **49** faces triangle face **41'**. Triangles **41** and **49** are then transposed so that triangle face **41** faces triangle face **49'**. The triangle edges of **41** and **49** are then hinged to complete the hexagon. The operation of the hexagon in changing from one set of facing triangles to another is identical with that described in connection with Figures 3A–3C.

It is abundantly clear from the foregoing description that the present invention provides a new and useful changeable amusement device which is extremely simple

in construction and has a very great interest appeal for both children and adults.

While we have illustrated and described certain preferred embodiments of our invention, it will be understood that it may be otherwise embodied within the scope of the following claims.

We claim:

1. A changeable amusement device and the like comprising eighteen equilateral triangles connected together along one edge to form a parallelogram, said triangles being folded along alternate lines into connected pairs to form an elongated parallelogram strip having nine triangular faces on each side, the ends of said strip being folded along the line between each third and fourth triangle and connected to form a hexagonal member.

2. A changeable amusement device and the like comprising eighteen equilateral triangles hingedly connecetd together along two adjacent sides to form an elongated parallelogram, said triangles being folded in pairs along alternate connecting sides to form a second elongated parallelogram whose long sides are one half the length of the first parallelogram, the ends of said parallelogram being folded along the line between each third and fourth triangle from said ends and being hingedly connected to form a hexagonal member.

3. A changeable amusement device and the like as claimed in claim 2 wherein the first parallelogram is an elongated strip of paper folded to form eighteen equilateral triangles.

4. A changeable amusement device and the like as claimed in claim 2 wherein the first parallelogram is made up of eighteen equilateral triangles of plastic hinged together along two adjacent sides to form said parallelogram.

5. A changeable amusement device and the like comprising eighteen equilateral triangles hingedly connected together along two adjacent sides to form an elongated parallelogram, said triangles along every other hinged connection being folded into superposed adjacent pairs by continuously folding the hinged triangles in the same direction, whereby to form a second elongated parallelogram, one end of said second parallelogram being folded upon itself at the junction of the third and fourth triangles from said end, the other end being folded upon itself in the opposite direction at the junction of the third and fourth triangles from said other end to form a hexagon and the unhinged ends being then transposed to lie on the outside of the hexagon and hingedly connected together.

6. A changeable amusement device and the like as claimed in claim 5 wherein each apex of each triangle is provided with a portion of a graphic representation and the like whereby each set of six apices at the center of the hexagon forms a complete representation.

7. A changeable amusement device and the like as claimed in claim 5 wherein the triangles are colored in different colors whereby each set of six triangles produces a different color combination in the hexagon.

8. A changeable amusement device and the like comprising an elongated parallelogram made up of nine hingedly connected equilateral triangles, said triangles being folded along the hinge line between each third and fourth triangle from the ends of the parallelogram and being hingedly connected at the end triangles to form a hexagonal member.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,883,195 April 21, 1959

Russell E. Rogers et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, lines 1 and 2, strike out "along every other hinged connection" and insert the same after "triangles" in line 3, same column.

Signed and sealed this 18th day of August 1959.

(SEAL)
Attest:
KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents