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[54] **INTERCONNECTED PUZZLE BLOCKS**

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[52] **U.S. Cl.** **273/156,** 35/70, 35/73, 46/25

[51] **Int. Cl.** **A63f 9/12**

[58] **Field of Search** ..... 273/155, 156, 157, 137 C; 46/25, 26; 35/77, 31 A, 31 G, 73, 35 J, 70; 40/77.4

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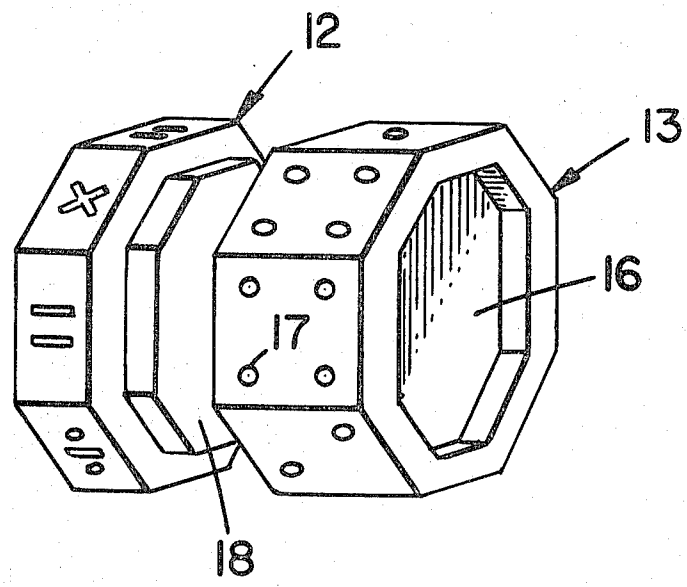
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Primary Examiner—Anton O. Oechsle
Attorney, Agent, or Firm—Phillips, Moore, Weissenberger, Lempio & Strabala

[57] **ABSTRACT**

A puzzle device is shown comprised of a plurality of blocks that can be interconnected in a plurality of positions. The blocks have faces thereon with differing indicia. In a certain one of these positions, the differing indicia on adjacent blocks are all linearly aligned and form a preselected interrelationship, such as a mathematically correct equation. The indicia on the blocks and the means for interconnecting the blocks is such that the place of alternate ones of the blocks may be interchanged with each other for interconnection, each of the blocks may be rotated in place about the longitudinal axis of the puzzle for interconnection in a plurality of positions and one or more of the blocks may be rotated about an axis normal to the longitudinal axis of the puzzle for interconnection in one of two orientations.

10 Claims, 9 Drawing Figures



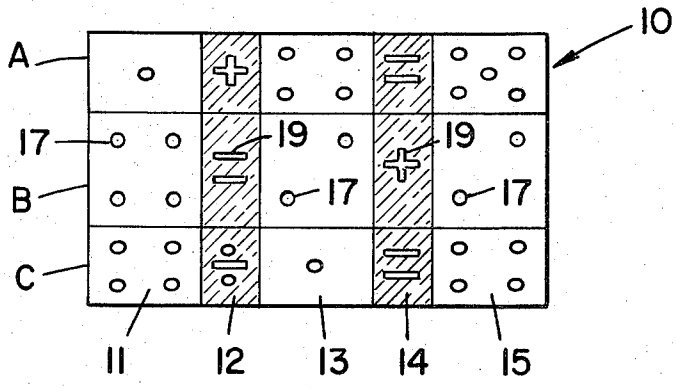


FIG_1

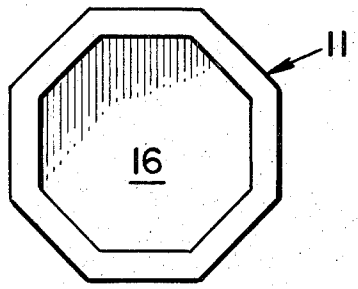


FIG_2

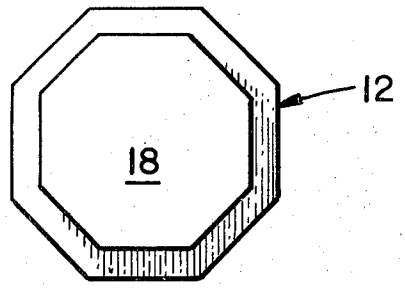


FIG_3

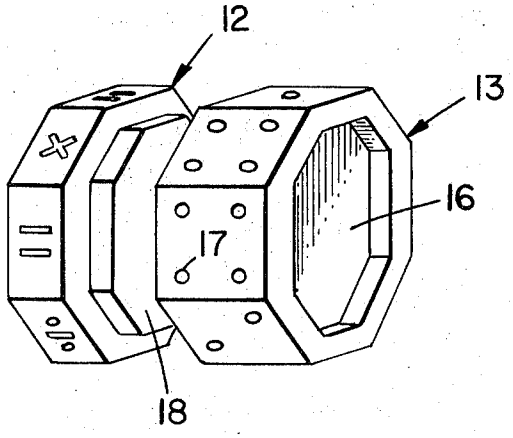


FIG_4

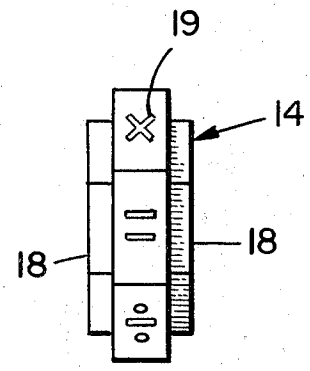


FIG_5

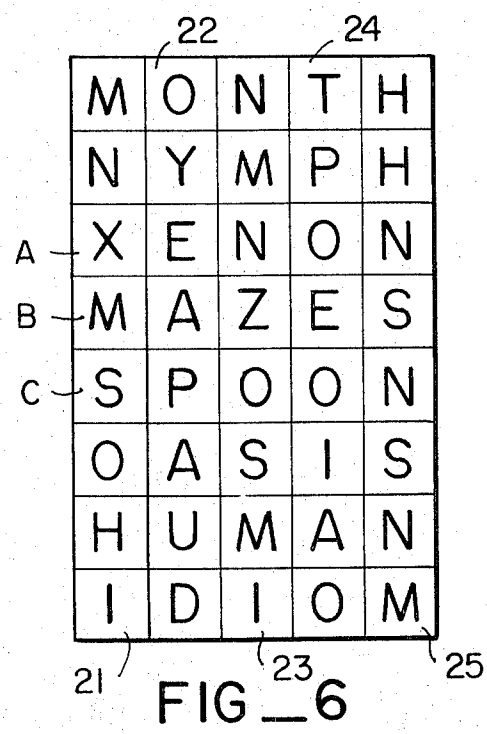


FIG_6

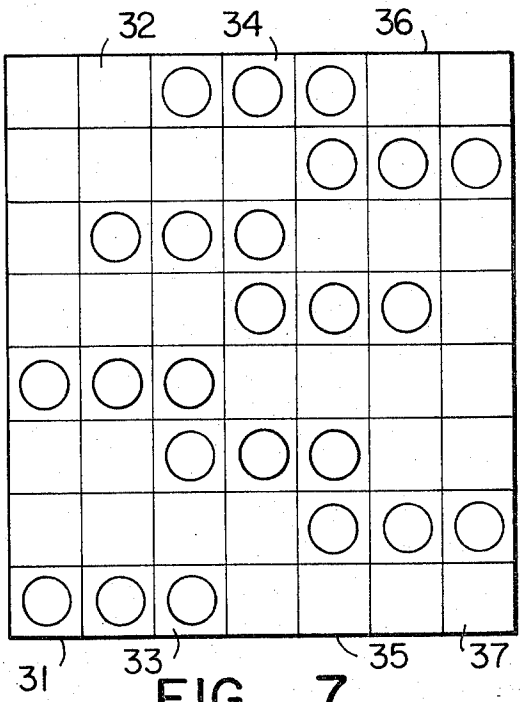


FIG_7

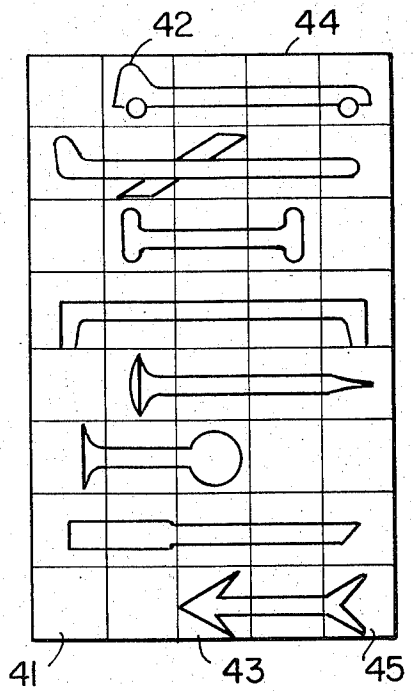


FIG_8

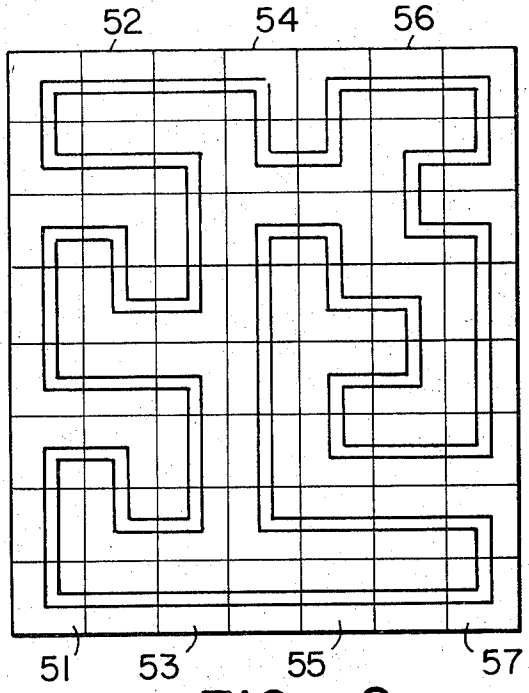


FIG_9

INTERCONNECTED PUZZLE BLOCKS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to puzzles; and, more particularly, to a puzzle device comprised of a plurality of interconnected blocks which is both entertaining and instructional.

2. Description of the Prior Art

Puzzles have always been popular for passing the time. The user, however, of such puzzles quickly loses interest when the solution thereof is known to him. There thus is a greater demand for puzzles which either have more than one possible solution or serve a further purpose during the attempt to solve such puzzle. This latter purpose may be educational or instructional and thus not only entertain the user during his attempt to solve the puzzle, but instruct him at the same time in an effortless manner.

Also, a puzzle, to be interesting, should have a large number of possible (but incorrect) solutions so as not to make the solving thereof merely a matter of eliminating a small number of alternatives.

However, in order to carry out the foregoing, such a puzzle should be as uncomplicated as possible so as not to discourage even the youngest of users. Further, such a puzzle should be easy and economical to manufacture so that it could be available to a wide audience at low cost.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a puzzle device which is easy to operate but difficult to solve.

It is a further object of this invention to provide a puzzle device which is capable of a relatively large number of variations yet only one or a few correct solutions.

It is a still further object of this invention to provide a puzzle device which instructs at the same time it entertains, such instruction being in the form of mathematical equations or the like which may include so-called "new math."

These and other objects are preferably accomplished by providing a plurality of blocks that can be interconnected in a plurality of positions. The blocks have faces thereon with differing indicia. In certain of these positions, the differing indicia on adjacent blocks are linearly aligned and form a preselected interrelationship, such as a mathematically correct equation. The indicia on the blocks and the means for interconnecting the blocks is such that the place of alternate ones of the blocks may be interchanged with each other for interconnection, each of the blocks may be rotated in place about the longitudinal axis of the puzzle for interconnection in a plurality of positions and at least one of the blocks may be rotated about an axis normal to the longitudinal axis of the puzzle for interconnection in one of two orientations.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view in elevation of a puzzle device according to one embodiment of my invention showing the blocks thereof interconnected in a manner forming a plurality of linearly aligned horizontal rows;

FIG. 2 is an end view in elevation of one of the blocks of FIG. 1;

FIG. 3 is an end view in elevation of another one of the blocks of FIG. 1;

FIG. 4 is a perspective view of the block of FIG. 3 together with a further block identical to that shown in FIG. 2;

FIG. 5 is a side view in elevation of yet another block identical to that shown in FIG. 3;

FIG. 6 is a representation in a common plane of all eight faces of five interconnected hexagonal blocks of a puzzle similar to that shown in FIG. 1 but with a different set of indicia thereon, each of the five vertical columns of FIG. 6 representing the eight faces of one of the five blocks;

FIG. 7 is a representation similar to FIG. 6 of a puzzle similar to that shown in FIG. 1 but consisting of seven hexagonal blocks with a further different set of indicia thereon;

FIG. 8 is a representation similar to FIG. 6 but showing a still further different set of indicia, and

FIG. 9 is a representation similar to FIG. 7 but showing yet another different set of indicia.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, FIG. 1 shows the puzzle device **10** according to one embodiment of this invention as comprised of a plurality of blocks **11** through **15.** Although five such blocks are shown, more or less may be used in other embodiments of my invention. These blocks **11** through **15** are shown in an interlocking relationship as will be explained more fully with reference to FIGS. **2** through **5.** Thus, as shown in FIG. **2,** block **11** is generally octagonally shaped about the outer periphery thereof and includes a like-shaped cavity **16** on each side thereof (the other cavity not being visible in the Figures). Each of the eight faces of block **11** has indicia **17** thereon, at least some of the indicia **17** on block **11** differing from face to face, as can be clearly seen in FIGS. **1** and **3.**

Blocks **13** and **15** in FIG. **1** are generally identical in configuration to block **11** of FIG. **2.** Preferably, these blocks **11, 13** and **15** may be of like color or surface characteristics for reasons to be discussed shortly. However, as clearly shown in FIG. **1,** the placement or orientation of the indicia **17** on the faces of blocks **13** and **14** is usually different from the placement or orientation of the indicia **17** on the faces of block **11,** again for reasons to be discussed shortly.

Referring now to FIGS. **3** and **4,** block **12** of FIG. **1** is shown as being generally octagonally shaped and having a raised portion **18** on each side thereof (see FIG. **5**). These portions **18** are also octagonally shaped and configured to fit snugly into the cavities **16** of blocks **11, 13** and **15** (see FIG. **4**). The indicia **19** of block **12,** however, is preferably of a different type from that of blocks **11, 13** and **15.** According to the embodiment shown in FIG. **1,** indicia **17** preferably relates to symbols representing numerical values; indicia **19,** however, preferably relates to symbols representing mathematical signs, such as plus, minus, division, equals, times, etc. As shown in FIG. **5,** block **14** is similar to block **12** with indicia **19** thereon being oriented on different faces from those on block **12** if desired. Finally, blocks **12** and **14** may be of like color or surface characteristics, the latter differing from the coloring or surface characteristics of blocks **11, 13** and **15.**

Referring once again to FIG. 1, it can be seen that blocks 11 through 15 are arranged so that the raised portions 18 of blocks 12 and 14 interlock with the cavities 16 in blocks 11, 13 and 15. In this manner, a plurality of linearly aligned horizontal rows A, B and C are formed (obviously there are eight such horizontal rows, the remaining five not being visible in FIG. 1).

The important features of the puzzle blocks of my invention should now be clear. It can be seen in FIG. 1 that the numerical symbols on the faces in horizontal row A on blocks 11, 13 and 15, together with the mathematical symbols on the faces in horizontal row A on blocks 12 and 14, result in a mathematically correct equation, i.e., 1+4=5. The same is true of horizontal rows B and C, i.e., 4= 2+2 and 4÷1 = 4, respectively.

However, it should be clear that the place and rotational position of blocks 11 through 15 may be changed in interconnecting the puzzle 10 so that correct mathematical solutions are not presented in every row. Thus, if the place of block 11 were interchanged with the place of block 13 in interconnecting the puzzle 10, row C would read 1÷4 = 4, an improper equation. However, rows A and B would still read as proper equations. Further, the place of blocks 12 and 14 may be interchanged so that the mathematical symbols change place in the puzzle 10. Thus, if block 14 were interchanged with block 12, row B would now read 4 + 2 = 2, an improper equation. Similarly, the equations of rows A and C would be improper.

Also, blocks 11 through 15 may be individually rotated in place about the longitudinal axis of the puzzle 10 so that different faces of the blocks are aligned in horizontal rows when the blocks are interconnected. Thus, block 11 may be rotated in place so that, for example, the symbol for the numeral 1 would be in row B instead of row A (the symbol then in row A is not visible in FIG. 1) and the symbol for the numeral 4 presently in row B would be in row C when the puzzle 10 is interconnected, producing an incorrect equation in row B. Also, block 11 may be interchanged with either block 13 or 15 to result in even further variations (these variations, of course, not necessarily resulting in correct equations).

Finally, the blocks 11 through 15 may be rotated in place about an axis normal to the longitudinal axis of the puzzle to one of two opposite orientations for interconnection. Such rotation will result in the indicia on the faces of the block being turned upside down. For this reason it is necessary that the indicia on each face of the puzzle be such that it can be correctly interrelated with the adjacent indicia in any given horizontal row of such indicia when the puzzle is interconnected regardless of the orientation of the blocks 11-15. Thus, it will be seen that the numerical symbols and the mathematical symbols of the embodiment of this invention shown in FIG. 1 will read exactly the same regardless of the orientation of the block to which they are applied. Since only certain numerals such as 0, 1 and 8 read the same upside down as right side up, the use of the other numerals would prevent the correct interconnection of the blocks 11, 13 and 15 in both of their two possible orientations and thus reduce the number of possible variations in interconnecting the puzzle 10.

Thus, all of the indicia 17, 19 on all of the faces of blocks 11 through 15 may be preselected so that only one solution is possible whereby all of the rows A, B, C ... (to the eight row) result in linearly aligned correct equations depending upon the proper placement and orientation of each block (for a total of eight correct mathematical equations). Of course, more than one solution may be possible.

Although it is not necessary that the coloring of blocks 11 through 15 differ as discussed above, such differing coloring may be used to teach a novice (such as a small child first learning mathematics) where to properly place the mathematical and numerical symbols (i.e., blocks 12 and 14, e.g., being of like coloring, are placed after the first numeral block and before the last, respectively).

Referring to FIG. 6 a planar representation of a further embodiment of this invengtion is shown. This embodiment of the invention is physically the same as the embodiment shown in FIGS. 1-5 except that letters of the alphabet constitute the indicia provided on the faces of the blocks instead of numerical symbols and mathematical symbols. Thus, as represented in FIG. 6 the letters appearing on the eight faces of the first block 21 are represented in the first vertical column and the letters appearing on the eight faces of the second block 22 are represented in the second vertical column, etc.

As represented in FIG. 6 the blocks 21-25 have been interconnected so that the letters in each horizontal row of the faces thereof spell a word in the English language and thus the puzzle has been solved. It will be understood that the places of blocks 21, 23 and 25 may be interchanged in interconnecting the puzzle and that the places of blocks 22 and 24 may be similarly interchanged as described above in connection with FIGS. 1-5 thus resulting in meaningless or misspelled words in certain or all of the horizontal rows.

Further, as described above in connection with FIGS. 1-5 each of the blocks may be rotated in place about the longitudinal axis of the puzzle in order to change the alignment of the faces of the blocks in the horizontal rows, again resulting in meaningless or misspelled words. Finally, the letters used on blocks 21, 23 and 25 have been selected from those which can be read either right side up or upside down. Thus, blocks 21, 23 and 25 may be rotated in place about an axis normal to the longitudinal axis of the puzzle between two opposite orientations. It will be understood that such rotation of block 21 for example will not only change the alignment of the faces thereof in the horizontal rows, but will also turn all of such letters upside down. The letters N, X, S, O, H and I will read exactly the same whether right side up or up side down. The letter M, however, will read W when upside down.

Referring to FIG. 7 another embodiment of this invention is represented in the planar manner described in connection with FIG. 6. According to the embodiment represented in FIG. 7 the puzzle consists of seven octagonal blocks 31-37, rather than five, and certain of the faces of the blocks have no indicia whatever on them. The remaining faces of the blocks all have identical indicia which may be a spot, circle, square or any other symmetric figure.

According to this embodiment of the invention the puzzle is solved when each of the horizontal rows of the puzzle contains three contiguous figures as shown. As described in connection with FIGS. 1-6, the places of blocks 31, 33, 35 and 37 may be interchanged with each other and the places of blocks 32, 34 and 36 may be interchanged with each other in interconnecting the puzzle. Similarly, all of the blocks 31-37 may be rotated

about the longitudinal axis of the puzzle for interconnection with different faces thereof aligned in horizontal rows. According to this embodiment all of the blocks **31-37** may be rotated about an axis normal to the longitudinal axis of the puzzle for interconnection in either of two opposite orientations since the symmetric figures will present the same appearance in either orientation.

Referring to FIG. **8** a further embodiment of this invention is represented in the planar manner described in connection with FIG. **6.** According to this embodiment the set of indicia applied to the faces of five octagonal blocks **41-45** is such that when properly aligned in horizontal rows eight stylized pictures are formed as shown. It will be seen that the set of indicia is such that a given face of certain of the blocks could form a portion of several of the pictures and that several faces of certain of the blocks are identical. As described in connection with the other embodiments, at least some of the blocks (block **44,** for example) may be rotated about an axis normal to the longitudinal axis of the puzzle to either of two opposite orientations for interconnection since the indicia on the faces thereof is symmetrical. Of course the places of blocks **41, 43,** and **45** as well as the places of blocks **42** and **44** may be interchanged in interconnecting the puzzle and all of the blocks **41-45** may be rotated about the longitudinal axis of the puzzle for interconnection.

Referring to FIG. **9,** still another embodiment of the invention is represented in the planar manner described above. This embodiment is substantially identical to the embodiment shown in FIG. **7** except that the set of indicia on the faces of the blocks **51-57** consists of markings that may be aligned to form a continuous path as shown.

Although octagonal blocks have been disclosed, obviously the number of faces may be changed without departing from the spirit of my invention. The configuration of cavities **16** and raised portions **18** would be changed accordingly so that each face of each block would be properly aligned with an adjacent face of a second interlocking block.

In summary, a puzzle device is disclosed having a plurality of freely disposed playing pieces that can be picked up and interlocked in a manner forming linearly aligned faces. These linearly aligned faces have a set of indicia thereon (e.g. numerical and mathematical indicia) capable of forming a "correct" interrelationship depending upon the proper positioning of the blocks. One or more like blocks may be either rotated in place, reversed (i.e., rotated about an axis normal to the longitudinal axis of the puzzle to either of two orientations) and/or interchanged with a like block. This results in the changing of the linearly aligned faces, thus adding great variety to the device due to the large number of possibilities presented. Finally, although other indicia may be used, indicia is preferred which adds an instructional aspect to my puzzle device while at the same time retaining the intriguing aspects of these types of devices. All of the foregoing is accomplished without the need for external aids or the like, such as cards, playing board, etc., thus making my device not only economical to manufacture but easy to use.

I claim as my invention:

1. A puzzle device comprising a plurality of freely disposed blocks each having a first axis and a plurality of faces disposed about said first axis with indicia appearing on more than one of said faces and interconnection means associated with each of said blocks adapted to enable said blocks to be serially interconnected with said first axes thereon aligned to form the longitudinal axis of the assembled puzzle device and with faces of adjacent blocks linearly aligned in a row extending along said longitudinal axis, said interconnection means being adapted to enable:

a. each of said blocks to be interconnected with an adjacent block in a plurality of rotational positions about said longitudinal axis;

b. at least two of said blocks to be interchanged with each other along said longitudinal axis for interconnection in said plurality of rotational positions; and

c. at least one of said blocks to be interconnected with an adjacent block in either of two opposite orientations about a second axis thereof normal to said longitudinal axis of said assembled puzzle device, said indicia appearing on said more than one of said faces of said at least one of said blocks and being of such form and placement on said faces as to give no indication specifically identifiable with either one of said two opposite orientations of said at least one of said blocks about said second axis normal to said longitudinal axis.

2. The puzzle device of claim **1** wherein said interconnection means comprises a protrusion along said first axis of one of said plurality of blocks adapted to fit into a cavity along said first axis of another of said plurality of blocks, at least one of said blocks having identical interconnection means at opposite sides of said faces thereof.

3. The puzzle device of claim **2** comprising a first block having identical protrusions along said first axis thereof on opposite sides of said faces thereof, a second block having identical cavities along said first axis thereof on opposite sides of said faces thereof, and a third block having interconnection means identical to one of said first and second blocks.

4. The puzzle device of claim **3** including at least five of said blocks of which three have interconnection means identical to one of said first and second blocks and two have interconnection means identical to the other of said first and second blocks.

5. The device of claim **4** wherein said indicia faces of on three of said blocks relates to numerical symbols and said indicia faces of on the other of said blocks relates to mathematical symbols, the interconnection of said blocks being in a manner whereby the first, third and fifth blocks include said numerical symbols thereon and the second and fourth blocks include said mathematical symbols thereon, resulting in a plurality of linearly aligned rows of mathematical equations.

6. The device of claim **5** wherein said mathematical and numerical symbols are adapted to give no indication of the orientation of said blocks about said second axes thereof normal to said longitudinal axis of said device when assembled.

7. The device of claim **5** wherein all of said blocks are octagonally shaped in outer configuration, resulting in eight faces on each of said blocks.

8. The device of claim **7** wherein said interconnection means includes octagonally shaped cavities on both sides of some of said blocks and octagonally shaped protrusions on both sides of the other of said blocks, said protrusions fitting into said cavities when said blocks are interconnected.

9. The puzzle device of claim 1 wherein said indicia on faces of said blocks comprise letters of the alphabet, said letters appearing on faces of said at least one of said blocks being selected from those letters which may be written to read correctly as a letter of the alphabet whether right side up or upside down.

10. The puzzle device of claim 1 wherein the indicia appearing on certain faces of said blocks will present an identical appearance regardless of the orientation of the block upon which it appears about a second axis thereof normal to said longitudinal axis of said device when assembled.

* * * * *