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Castanis

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[54] **PEGGED BOARD PUZZLE**

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[73] Assignee: **Kohner Bros., Inc.**

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[51] **Int. Cl.** **A63f 9/10**

[58] **Field of Search** ..... 273/156, 157 R, 130 AC, 273/136 E, 153 R; 35/73

[56] **References Cited**

UNITED STATES PATENTS

455,066	6/1891	Stern	273/156
1,501,554	7/1924	Brunn	273/157 R UX
1,954,424	4/1934	Otwell	273/156 X
1,978,107	10/1934	Hoffmann	273/153 R
2,887,789	5/1959	Bobo et al	273/148 A UX
3,151,867	10/1964	Miller	273/157 R
3,481,603	12/1969	Sugden	273/130 AC

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[57] **ABSTRACT**

A puzzle is comprised of a playing board of a size capable of accommodating on its surface a plurality of playing pieces. Projecting from the surface of the board are a plurality of pins or pegs arranged in individual groupings or patterns of varying numbers of pegs and arrayed throughout a plurality of intersecting columns and rows with the spacing between adjoining patterns being uniform both in the column and row direction. The playing pieces are rectangular and each is perforated in individual groupings or patterns corresponding to and matching the patterns of the aforesaid pegs. Each piece has perforations representing a pair of individual perforation patterns, the spacing between the perforation patterns being the same as the spacing between adjoining peg patterns on the playing board so that a playing piece may be placed flush on the surface of the board only at a location wherein the perforation patterns on the playing piece match with and correspond to the patterns of two adjoining peg patterns. The combination of perforation patterns on each playing piece is different from that of every other playing piece and the number and arrangement of peg patterns on the board is designed so as to just accommodate every one of the playing pieces when correctly positioned on the board.

9 Claims, 6 Drawing Figures

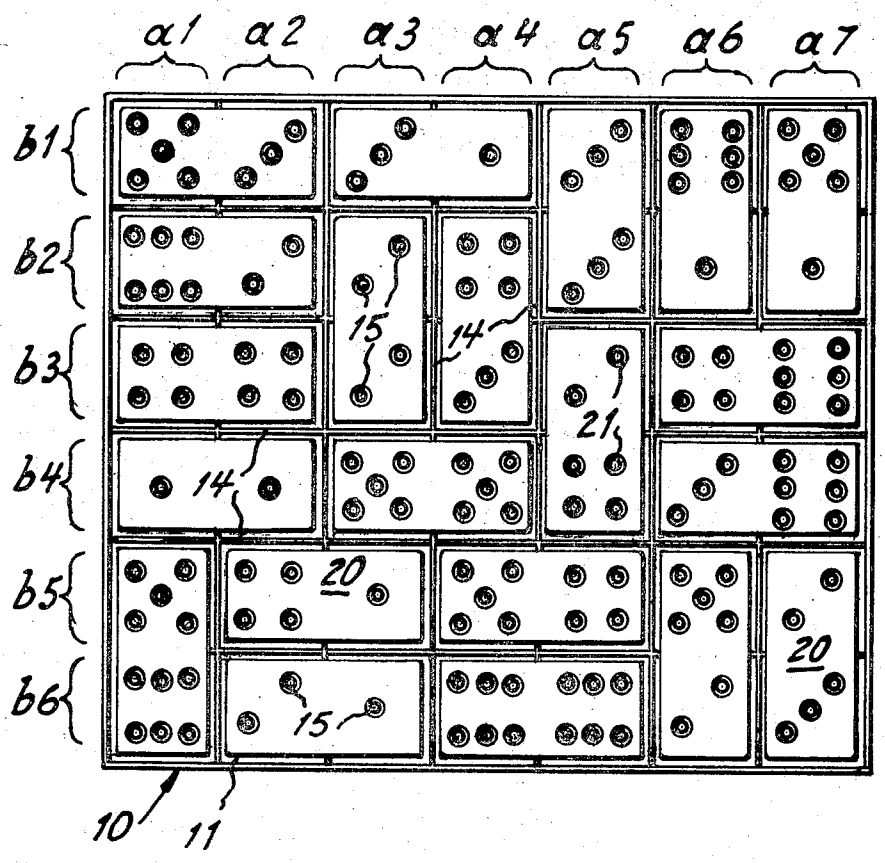
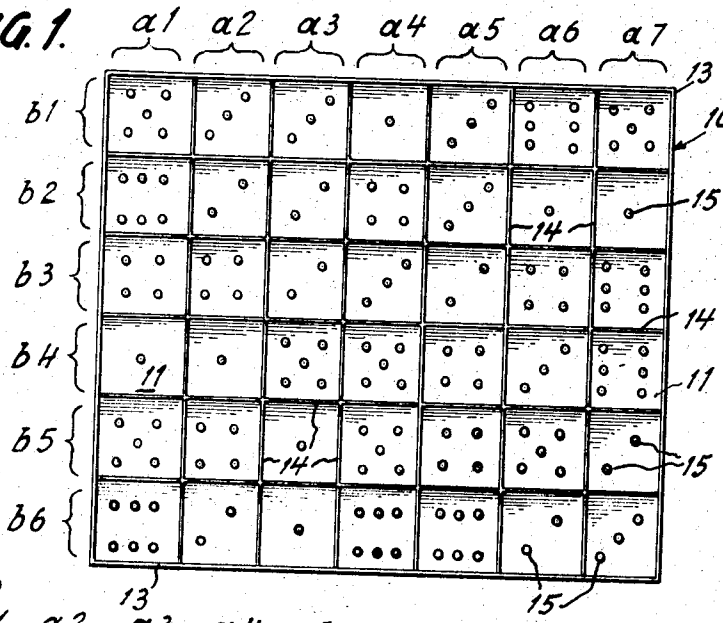


FIG. 1.



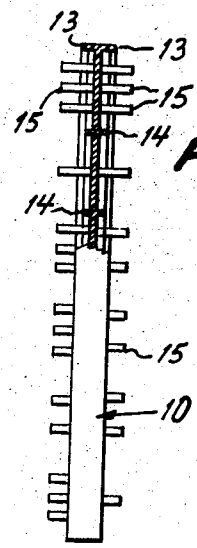


FIG. 2

FIG. 3

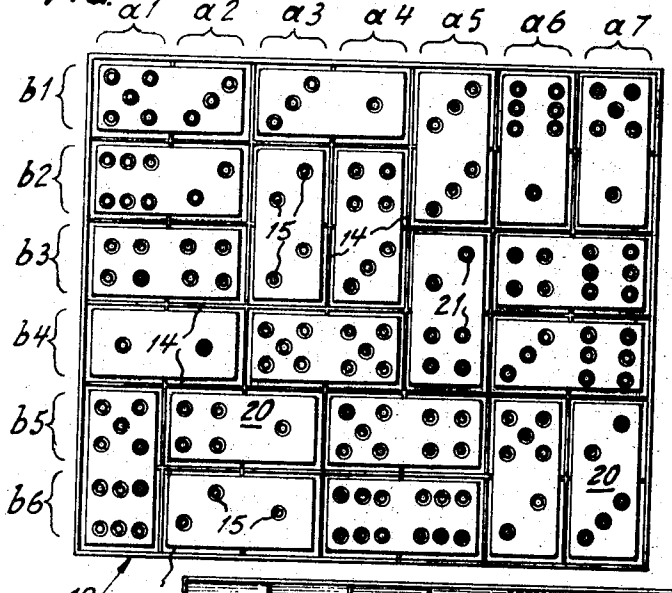
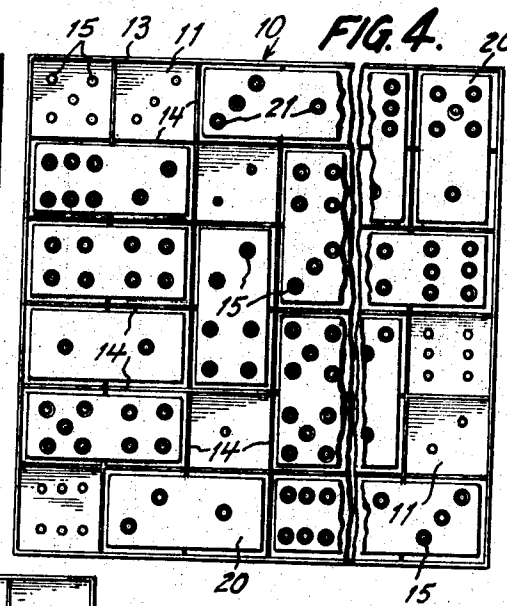


FIG. 4.



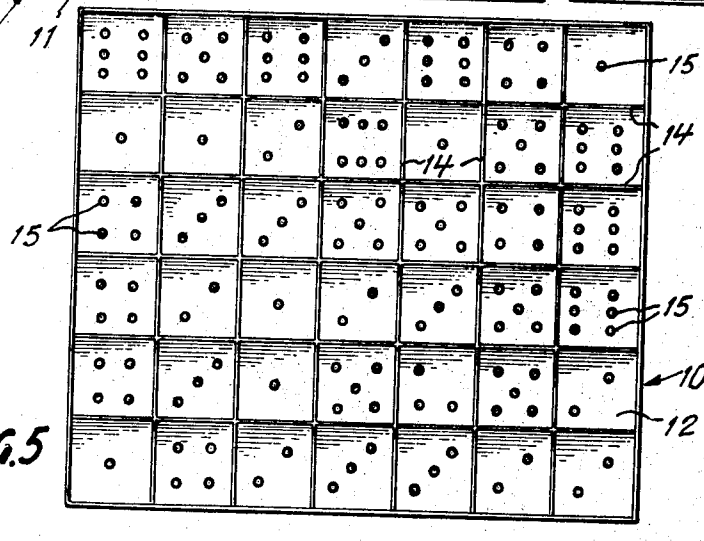


FIG. 5

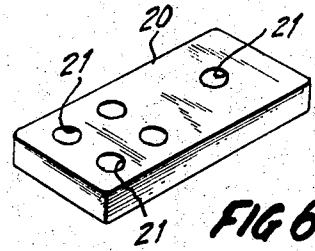


FIG 6.

PEGGED BOARD PUZZLE

SUMMARY OF THE INVENTION

This invention relates generally to amusement devices and more particularly to a puzzle requiring the exercise of deductive reasoning for its logical solution.

In most puzzles of this character which involve placement of playing pieces on a surface in a step-by-step manner, so as to eventually complete a composite whole for a solution, the correct placement of a piece, particularly near the start of the puzzle where there are alternate or plural possible placements for that piece, is often a matter of chance. In such cases, a wrong move or placement, while not necessarily interrupting further continuation of efforts toward reaching a solution, will, however, subsequently prevent a complete solution to the puzzle necessitating a new start and proceeding subsequently along a different tack. In such type puzzles, arriving at the solution does not provide rewards or satisfaction of a high order since attainment of the solution is to a great extent dependent upon luck or good fortune rather than the exercise of deductive reasoning or application of logic.

In the puzzle of the instant invention, there is a wide range of possible moves at the start, and any one of the several playing pieces can be positioned or played first. Moreover, in most cases the piece first played is capable of being placed in any one of several placements or locations on the board's surface, so there are many opportunities for making a wrong move, not only at the start but while the play proceeds. However, by carefully examining the arrangement of pins on the playing board, it is possible through observation and application of reasoning to determine a first move which leaves nothing to chance. The first move, in turn, leads to subsequent moves all of which can be logically determined so as to eventually lead at the correct solution. Thus, arriving at a solution to the puzzle gives the player a high sense of accomplishment and a great feeling of enjoyment, which is not so much the case with previously known puzzles of this general type wherein the solution depends largely on chance and is usually attained only by employing rather frustrating trial by error tactics.

It is, therefore, an object of the invention to provide a puzzle which rewards the exercise of deductive reasoning.

It is a further object of the invention to provide a puzzle of which the solution proceeds through a logical and determinable step-by-step progression.

It is a further object of the invention to provide a puzzle simplified in construction and economical to manufacture.

Further objects of the invention, together with the features contributing thereto and advantages accruing therefrom, will be apparent from the drawing when read in conjunction with the description which follows.

DRAWING DESCRIPTION

FIG. **1** is a top plan view of a playing board as at the start of the puzzle and without any playing pieces thereon.

FIG. **2** is a side view of the playing board of FIG. **1** when maintained in an upright position.

FIG. **3** is a top plan view of the playing board at the successful completion of the puzzle with all the playing pieces in correct position thereon.

FIG. **4** is a top plan view of the playing board showing some of the pieces incorrectly placed thereon, thus preventing a solution.

FIG. **5** is a bottom plan view of the playing board without any playing pieces placed thereon, and

FIG. **6** is a perspective view of one of the playing pieces of the puzzle.

DETAILED DESCRIPTION

Referring now to the drawing, the playing board **10** which is rectangular in configuration and may be made of any suitable material, preferably plastic, having sufficient strength and stiffness to maintain its shape presents a relatively smooth top surface **11** and a similar bottom surface **12** (see FIG. **5**) from both of which surfaces project a plurality of pins or pegs **15** arrayed in a plurality of groupings of patterns extending along a plurality of intersecting columns and rows. As indicated in connection with FIGS. **1, 3** and **4,** the surface **11** of the playing board with the pegs projecting therefrom may be considered a matrix with the vertical columns of peg patterns representing coordinates "*a*" and the horizontal rows of peg patterns representing coordinates "*b*," each pattern of perforations being located at an intersection of an "*a*" with a "*b*" coordinate. The peg patterns may take one of several forms and in the illustrated example may be one of six different forms, since the board of the illustrated embodiment is intended for use with playing pieces simulating conventional dominoes which traditionally are marked with designations in pattern form representing values from one through six. The pegs **15** are all of identical size and are firmly mounted in the board so as to be completely integral therewith. The various peg patterns which appear on the board in an apparent random arrangement include a pattern consisting of only one perforation as shown at the intersection of coordinates *a***4**-*b***1.** The pattern consisting of two pins or pegs **15** is located at the intersection of coordinates *a***2**-*b***2**; a three peg pattern appears at coordinates *a***2**-*b***1**; a four peg pattern appears at the intersection of coordinates *a***4**-*b***2**; five peg patterns appear at the upper right-hand and upper left-hand corners of the board, i.e., at intersection of coordinates *a***1**-*b***1** and *a***7**-*b***1**; a six peg pattern is shown at the intersection of coordinates *a***6**-*b***1.** It will be noted that the spacing between the centers of adjoining peg patterns is uniform and the same whether the patterns adjoin along an "*a*" coordinate or along a "*b*" coordinate.

The members employed for carrying out the puzzle and its solution are rectangular playing pieces **20** simulating dominoes, formed from any suitable material, preferably a plastic, and having a width and length sufficient to carry designations at each end thereof in the form of a pattern of perforations **21** corresponding in size and format to the patterns of pegs **15.** The thickness of each piece **20** is substantially equal to the heighth of the pegs. FIG. **6** illustrates a playing piece **20** which carries a pattern of four perforations in the left half thereof and a pattern consisting of one perforation **21** in the right half thereof. For purposes of description, this member will be hereinafter referred to as the **4-1** playing piece **20** or alternatively the **1-4** playing piece

20, and the remaining playing pieces in the set will be similarly identified.

It will, of course, be understood that each perforation 21 in a playing piece 20 has a diameter at least as great as, or preferably slightly larger than, that of each of the pegs 15 mounted in the playing board 10. Thus, during the play of the pieces in attempting to solve the puzzle, when a location on the board is found wherein two adjoining peg patterns match the two perforation patterns carried by a given playing piece 20, said playing piece may be placed at that location of the board with the upstanding pegs being received into corresponding perforations of the piece to enable it to be positively placed and located with its surface flush or substantially so with the surface 11 of the playing board. Preferably, the pieces are darkly colored and the pegs lightly colored so that when viewed together after a piece is played, its resemblance to a domino is more striking. If desired, surface 11 may be slightly recessed below the edges of the board so as to leave a narrow margin or border 13 extending around the board's surface. The surface may also be marked or criss-crossed with a plurality of slightly raised narrow ridges 14, separating the columns and rows of perforation patterns from one another, and in so doing constituting a slightly raised fulcrum point upon which the center of a playing piece rests when placed on the board's surface in an appropriate location. These ridges have the effect of preventing the playing pieces from lying absolutely flush with the board surface in which condition they would be somewhat difficult to remove, as when a wrong play has been made, and permits the pieces to be slightly rocked or jiggled about the fulcrum point to assist in lifting the piece manually from the board's surface.

As heretofore mentioned, the playing pieces 20 are formed to simulate conventional pieces of a domino set wherein the conventional dots of a domino playing piece are replaced by perforations. Since in a traditional game of dominoes wherein each half of the domino playing piece is designated or marked with a pattern of dots ranging from one to six dots, it will be apparent that a total set of playing pieces wherein each carries a different combination of perforation patterns will consist of a total of 21 playing pieces. Thus, it will be seen also that the playing board 10 will carry on each surface a total of 42 separate peg patterns arranged in seven columns and six rows with each of the six different patterns appearing at seven different locations on the board. In this manner it will be apparent that the board can accommodate on its surface the complete set of 21 playing pieces 20, but with this being possible only when each of the playing pieces is laced at its one and only correct location on the board's surface.

To solve the puzzle, the player lays the board on a suitable and preferably horizontal play surface with the pieces 20 removed therefrom and then undertakes to place the pieces in turn in the correct matching locations on the board so as to enable the board to accommodate each and every one of the playing pieces. It will be noted in most cases that for each combination of perforation patterns carried by a playing piece there are two or more board locations having matching peg patterns. It must be remembered, however, that only one of said locations is a proper location which will enable the surface of the board to eventually accommodate all the playing pieces. It is, of course, possible to solve the puzzle by proceeding on a trial and error basis. However, the successful completion of the puzzle in a reasonable time by trial and error tactics is exceedingly unlikely since there are so many opportunities to make a wrong move and frequently, or in most cases, the discovery of the error does not occur until several moves later. Thus, when an error is eventually discovered, it is not easy to determine which of the prior moves constituted the error in the first instance.

FIG. 4 illustrates a condition which develops when errors have been made in the placement of the playing pieces. As seen in FIG. 4, the play of the pieces has left an isolated pin pattern of six pins at the lower left-hand corner of the playing surface, or otherwise identified as the intersection of coordinates *a*1-*b*6. This condition means that either or both the adjoining pieces 20, i.e., the 2-1 playing piece or the 5-4 playing piece have been incorrectly placed at their respective locations shown in FIG. 4. Similarly in the column representing coordinate *a*3 the peg patterns at locations *a*3-*b*2 and *a*3-*b*5 have been isolated by the placement of adjoining playing pieces, thus being unusable as a placement location for a playing piece and thereby preventing successful completion or solution to the puzzle.

Instead of requiring a player to rely on trial and error efforts to reach a successful solution, the arrangement of the peg patterns and their relative relationship to one another on the surface of the playing board is such as to enable a correct first play and subsequent plays to be determinable upon a careful examination of the playing surface and application of logic and deductive reasoning based upon the factors which are known. The player knows that the combination of perforation patterns on each playing piece is different from that of every other playing piece, and he further knows that every pattern of pegs on the playing surface must be covered, that none can be wasted, in order for the surface of the board to be able to accommodate each and every playing piece. Fortified with these known facts, the player is then able to proceed and examine the surface of the board for some clue as to what the first correct move or placement of a playing piece should be. Examination of the playing surface reveals in many instances the same combination of two adjoining peg patterns occurs at two or more locations on the playing surface. For example, the five peg pattern in combination with the six peg pattern appears at the *a*1-*b*1 and *a*1-*b*2 coordinate intersections or location on the board's surface. The same combination occurs at the *a*6-*b*1 and *a*7-*b*1 location; also it occurs at the *a*1-*b*5 and *a*1-*b*6 location; it further occurs at the *a*4-*b*5 and *a*4-*b*6 location. There is, however, no clue as to which of these four locations is the correct location for the 5-6 playing piece. Further analysis of the board's surface reveals that some other combinations of peg patterns do not occur with the same multiplicity, and it is then decided to inspect the board's surface to determine if there is any combination of two adjoining peg patterns which occurs only once, since it is a guiding principle in the correct solution of the puzzle that no playing piece be placed until it is determined logically that it cannot be placed at any other location.

Scanning the various combinations in sequence, the player observes that the 1-1 combination of peg patterns occurs at two different locations, this being at coordinate intersections *a*1-*b*4 and *a*2-*b*4, the other location being at *a*6-*b*2 and *a*7-*b*2. Scanning for the occur-

rence of the **2-1** peg pattern, however, it is observed that this combination occurs at only one location on the board, this being at the intersections of coordinates *a*2-*b*6 and *a*3-*b*6. Thus, a correct first move has been determined to be the placement of the **2-1** playing piece **20** at the aforementioned location of the matching combination of peg patterns on the board's surface.

The second move logically is placement of the **5-6** playing piece in the lower left-hand corner of the board's surface at the location identified by the intersection of coordinates *a*1-*b*5 and *a*1-*b*6, since this location was in effect trapped by the first move and no other playing piece could occupy the *a*1-*b*6 portion of this location.

The third move logically follows from the second and consists of placing the **5-3** piece in the upper left-hand corner at location *a*1-*b*1 and *a*2-*b*1. This is the only placement that can utilize the five peg pattern at intersection *a*1-*b*1 since the only other combination utilizing this corner of the board is the **5-6** combination which had previously been used in the second move.

The fourth move also follows logically from the second and consists in placing the **5-1** piece at the location of the matching pin patterns at the upper right-hand corner of the borad at the location *a*7-*b*1 and *a*7-*b*2. This follows for the same reason as explained in connection with move number two.

Move number five consists of placement of the **1-1** piece at location *a*1-*b*4 and *a*2-*b*4. This is the only location for such combination after the single peg pattern at *a*7-*b*2 was utilized at move number four.

Move number six consists in placing the **4-1** piece at location *a*2-*b*5 and *a*3-*b*5 since the *a*2-*b*5 position was trapped in the preceding move and can only be utilized by the **4-1** playing piece **20.**

The seventh move consists in placing the **6-1** piece at the location *a*6-*b*1 and *a*6-*b*2 since this is the only remaining location for such a combination after the fourth move was made.

The eighth move logically consists in placing the **3-6** piece at location *a*6-*b*4 and *a*7-*b*4 since this is the only remaining location providing a matching combination of peg patterns after the six peg pattern at *a*6-*b*1 was utilized in the seventh move.

The ninth move consists in placing the **4-6** piece at location *a*6-*b*3 and *a*7-*b*3 as this location was trapped upon making the previous eighth move.

The 10th move consists in placing the **6-6** piece at the location *a*4-*b*6 and *a*5-*b*6 since this location is now the only remaining one having a matching combination of peg patterns.

The 11th move is the placement of the **6-2** piece at location *a*1-*b*2 and *a*2-*b*2 since this is now the only remaining location for this combination.

The 12th move resides in the placement of the **4-4** piece at location *a*1-*b*3 and *a*2-*b*3 since this location was trapped by the preceding move.

The 13th move consists in the placement of the **2-2** piece at location *a*3-*b*2 and *a*3-*b*3 as this is now the only remaining location for this combination after having made the eleventh move.

The 14th move is the placement of the **5-5** piece at location *a*3-*b*4 and *a*4-*b*4 since this location was trapped by the preceding move.

The 15th move is the placement of the **5-4** piece at location *a*4-*b*5 and *a*5-*b*5 as this location was trapped by the preceding move.

The 16th move consists in the placement of the **2-4** piece at location *a*5-*b*3 and *a*5-*b*4 as this location was trapped by the two preceding moves.

The 17th move is the placement of the **4-3** piece at location *a*4-*b*2 and *a*4-*b*3 as this location was trapped by the preceding move.

The 18th move consists in the placement of the **3-3** piece at location *a*5-*b*1 and *a*5-*b*2 since this location was trapped by the preceding move.

The 19th move consists of placing the **3-1** piece at location *a*3-*b*1 and *a*4-*b*1.

The 20th and 21st moves consist of placing the **5-2** and the **3-2** pieces in the lower right-hand corner of the board at location *a*6-*b*5; *a*7-*b*5, *a*6-*b*6 and *a*7-*b*6. These last two pieces will fit at such location in two different ways, either one of which may be considered correct and the sequence in which they are placed being immaterial.

Thus, it will be seen that the surface of the board provides a location for receiving each and every one of the set of 21 playing pieces **20,** and that in so doing each and every one of the peg patterns arrayed on the surface of the board is utilized. From the foregoing, it will also be apparent that the puzzle may be solved by applying logic to the solution and following the principle of not making a move until it is determined that there is but one logical location for placing a given piece and that it cannot logically fit at any other location.

If desired, an additional puzzle of the same type may be provided on the reverse side of the playing board **20.** As shown in FIG. **5,** a similar type arrangement of peg patterns are arrayed across the surface **12** of the board but with the peg patterns in a somewhat different order than those on the top surface **11** of the board, heretofore fully described. The puzzle represented by the reverse side of the board and shown in FIG. **5** makes use of the same set of playing pieces **20** and maintains the same objectives as its counterpart on the top surface of the board, and its solution is accomplished by application of the same principle and logic as applied in solving the puzzle heretofore fully described. For this reason, a detailed analysis of the solution of the puzzle depicted in FIG. **5** is deemed superfluous.

While there has been shown and described what is considered a preferred embodiment of the invention, it is recognized that various modifications and changes in form could be made therein without departing from the spirit of the invention. It is, therefore, intended that the scope of the invention be not limited to the exact form thereof herein shown and described nor to anything less than the whole of the invention as hereinafter claimed.

What is claimed is:

1. A puzzle having its solution determinable by the exercise of logic comprising

a. a rectangular playing board having a plurality of upright pegs of uniform size projecting from one surface thereof, said pegs being arranged in groups of varying quantity representing a predetermined number of different peg patterns, said patterns being arrayed in a plurality of perpendicularly intersecting columns and rows with adjoining patterns spaced from one another a uniform distance in both the row and column direction, the array of

peg patterns consisting of a distinct pair of adjoining patterns constituting in combination each permutation of distinct pairs of said predetermined number of different peg patterns, and

b. a set of rectangular playing pieces formed with perforations therethrough of a size and shape to accommodate and receive said pegs, said perforations being arranged in distinct perforation patterns disposed at opposite ends of a said piece and spaced apart the same said uniform distance, each said piece constituting a paired combination of perforation patterns, said set of pieces consisting of one piece for each said distinct pair of adjoining peg patterns and formed with a corresponding combination of perforation patterns, whereby placement of each piece of the set at its correct matching location on the surface of the board is permitted by the receipt and accommodation of the respective pegs within the matching perforations of the pieces.

2. The invention according to claim **1** wherein the same combination of adjoining pairs of peg patterns occurs at a plurality of locations within said array, and wherein only one of said locations is the correct location for placement of the piece having the matching combination of perforation patterns.

3. The invention according to claim **2** wherein the paired combination of adjoining peg patterns matching a combination of perforation patterns in a predetermined one of said pieces occurs at only one location in said array.

4. The invention according to claim **1** wherein the varying quantity of pegs constituting a peg pattern range in number from one to six.

5. The invention according to claim **4** wherein the configuration of the different perforation patterns in said playing pieces corresponds to the configuration of the different dot patterns on the dominoes of a set thereof.

6. The invention according to claim **1** wherein said pegs have a color in contrast to the color of said playing pieces.

7. The invention according to claim **6** wherein the color of said pegs is light and the color of said playing pieces is dark.

8. The invention according to claim **1** wherein the surface of said board is formed with a plurality of intersecting ridges extending row-wise and column-wise between adjoining rows and adjoining columns of said peg patterns, said ridges serving as fulcrum points for playing pieces placed on said surface.

9. The invention according to claim **1** wherein both opposed surfaces of said board are provided with an array of said pegs, the arrangement of peg patterns in one array being different from that in the other array, whereby the puzzles represented by both board surfaces call for distinct and different solutions.

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