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F. G. DUSTIN

1,993,211

PUZZLE

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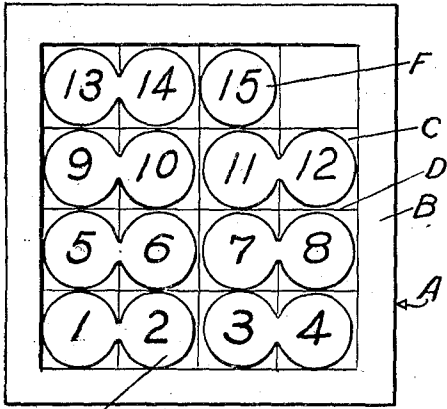


Fig. 1.

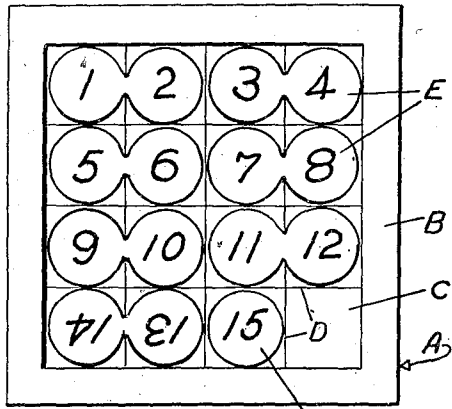


Fig. 2.

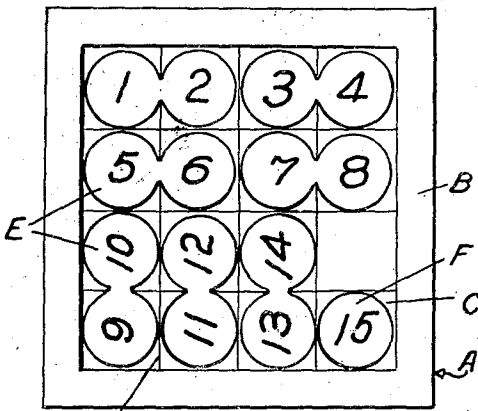


Fig. 3.

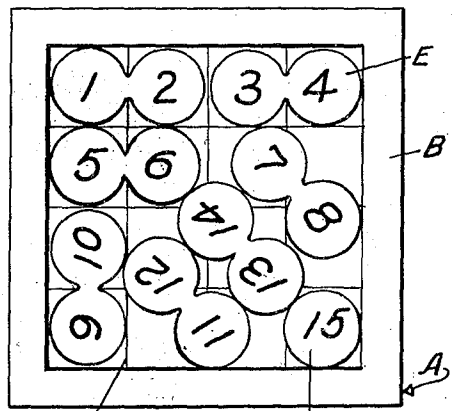


Fig. 4.

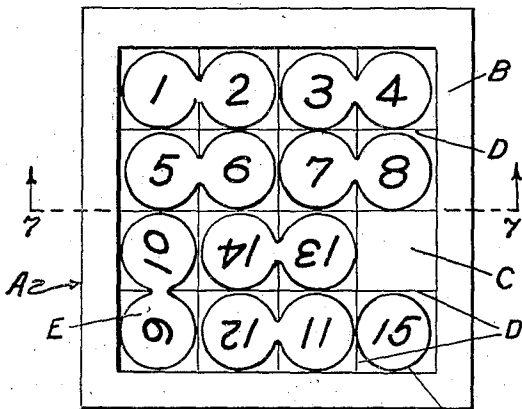


Fig. 5.

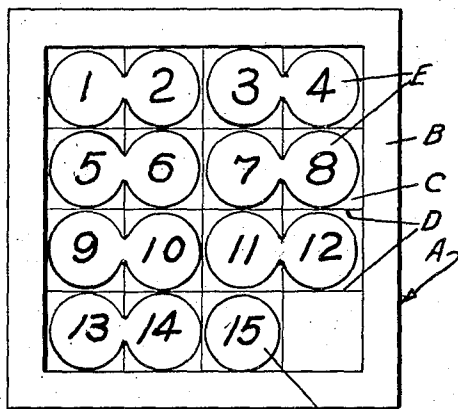


Fig. 6.



Fig. 7.

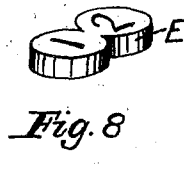


Fig. 8.

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# UNITED STATES PATENT OFFICE

1,993,211

PUZZLE

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4 Claims. (Cl. 273-132)

This invention relates to puzzles for the amusement, mental development, and edification of both children and adults, and the primary object is to provide a device of simple and economical construction that will answer such purposes. More specifically the puzzle comprises a frame or receptacle providing a restricted enclosure for a series of playing pieces that are selectively shiftable into various positions, and provided with identification characters, all to the end that a player or operator may, with a certain degree of mental activity and patience, move the pieces from one predetermined or set arrangement to another predetermined or desired arrangement, and without lifting or removing any of the playing pieces from the board.

In the accompanying drawing, which illustrates a preferred embodiment of the invention, the six illustrations, Figs. 1 to 6, inclusive, are plan views of the puzzle with the playing pieces in various group positions.

Fig. 7 is a sectional view on the line 7-7 in Fig. 5; and Fig. 8 is a perspective detail view of one of the playing pieces.

Referring to the drawing more particularly and by reference characters, A generally designates a game board or frame having an upstanding outer flange portion B defining a rectangular and preferably square playing field C, which in the present instance is lined as at D in checker board fashion to provide a plurality of playing squares upon which the playing pieces rest.

The playing pieces E, of which there are seven in the present arrangement, are generally of a figure eight contour so as to have circular end portions that are integrally formed so as to provide single playing pieces of a double unit character. The playing pieces are provided upon their upper faces with identifying characters of any suitable nature, but which in the present instance comprise numbers running in pairs from "1" to "14", inclusive. In addition to the seven double unit playing pieces E, I also provide a single unit playing piece F which is circular and of a size corresponding to one end portion of one of the playing pieces E. The piece F in the present instance is identified by the number "15" imprinted thereon, as shown.

The arrangement thus far described shows that the playing field C will be substantially covered by the playing pieces except for a single square adjacent the playing piece "15", with a result that one of the double unit pieces adjacent the vacant square may be moved into the space either by a direct endwise movement or by an angular

or turning movement. In other words, the piece "13-14" as shown in Fig. 5 could be moved into the vacant square by being moved lengthwise to the right; or, the vacant space could be filled by moving the piece "7-8" in a quarter turn and downwardly; or, the single piece "15" could be moved into the vacant square to provide room for a movement of the piece "11-12" to the right.

By thus moving one piece after another into the successively occurring vacant squares it will readily be seen that all of the playing pieces are subject to being moved about within the frame and without being lifted therefrom.

It should be noted that the playing pieces have sufficient play or freedom within the frame to permit their being moved about without any binding action as long as the endwise and turning movements above referred to are followed. It should be noted, however, that the frame is sufficiently restrictive so as to prevent almost any other kind of movement. It is possible, with a certain arrangement of the pieces, as indicated in Fig. 4, to place certain of them in angular positions, and, in fact, such movements are necessary to the solution of the problem which will presently be described. Such movements, however, are not ordinarily anticipated by a person unfamiliar with the puzzle, and, in fact the main purpose of the checker board lineations is to distract the operator's mind from seeking a solution by any other than straight or right angular movements of the playing pieces.

If it be assumed that the problem presented for solution is, to convert the playing pieces from the order of arrangement shown in Fig. 1 to the reversed or properly readable arrangement as shown in Fig. 6, then the process of normal solution would require the orderly movement of the pieces along the squares or markings; and while this series of movements does not necessarily need to follow any complete predetermined plan, the time required for reversing the positions of the pieces will depend largely upon the systematic process employed.

Ordinarily there is presented no particular difficulty in merely rearranging the pieces so that their chronology will be reversed. It is found, however, that almost invariably, if not always, there will be at least one of the units that will rest in a reversed or up side down position.

At this time, or during the preceding movements, it may occur to the operator to attempt a proper positioning of any of the pieces by a more or less scrambling of some or all of the pieces within the playing area. If the frame is

sufficiently large this of course may be done, and consequently the solution to the problem is greatly simplified. If, however, the frame is sufficiently restrictive this general scrambling is not possible, and consequently the solution to the problem becomes much more difficult.

When the frame is of such a size as to be most restrictive consistent with the possible solution of the problem, there is, as already pointed out, no particular difficulty in so moving the pieces so as to reverse their entire arrangement. When the rearrangement has been completed, however, there will, as also pointed out, invariably be at least one piece that is reversed end for end so that its characters will be up side down.

For purpose of explaining the method of reversing any such piece it may be assumed that all of the pieces have been rearranged and are in proper sequence and position with the exception of the double unit playing piece indicated as "13-14", which is in its proper place but inverted, as shown in Fig. 2. The problem now is to reverse the piece "13-14" from the position shown in Fig. 2 to the proper position as shown in Fig. 6, and this is done by first moving pieces "9-10", "11-12", and "13-14" to the vertical positions shown in Fig. 3. The second step is to drop the right end of the piece "7-8" down far enough so that the pieces "11-12" and "13-14" may be shifted to parallel positions with respect to the piece "7-8", but diagonally with respect to the frame, as shown in Fig. 4. At this point it should be noted that the piece "13-14" is of such a length that it can only be turned on its own axis by passing between the pieces "5-6" and "15", and the opening between these last mentioned pieces is such that the piece "13-14" will only pass by very snug fit or contact therewith. At such time it may also be noted that in order to provide for the smallest possible frame it will also be necessary that the pieces "1-2" and "5-6" will be in close contact with each other, and with the upper left-hand corner of the frame.

When the piece "13-14" has been partially rotated on its own axis in a counterclockwise direction, and without having its general position shifted, then it becomes a comparatively simple matter to move the pieces into the positions shown in Fig. 5, and from thence into the final position shown in Fig. 6 where it will be seen that all the pieces are in their proper positions.

It may here be noted that while the piece "15" is shown in the present instance as being of a size corresponding to the end portions of the various double unit playing pieces, a smaller piece "15" may be employed, in which instance the frame A can be still more restricted without in any way interfering with the normal movement

of the pieces, thus further adding to the difficulty of solving the puzzle.

It will further be understood that while a certain problem has been described in the foregoing specification, still other problems may be worked with the device, and if letters are used instead of the figures for identifying the pieces, certain predetermined words or even short sentences might be the ultimate thing sought for.

It is still further understood that various other modifications of the invention may be made without departing from the spirit and scope of the appended claims. Having now therefore fully illustrated and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. A puzzle comprising a plate member with a marginal portion extending thereabove to form a restricted substantially rectangular playing surface on the plate member, and a series of playing pieces resting on said surface within said marginal portion, and selectively having freedom for turning or endwise movements to effect a change in one predetermined arrangement of the series to another without said pieces being lifted from the surface, all but one of said playing pieces being elongated in form, and having lateral recesses to facilitate said turning movements.

2. A puzzle comprising a frame having a restricted substantially rectangular playing surface, and a series of playing pieces resting on said surface and adapted to be moved in straight and curved paths from one predetermined arrangement to another without being lifted from the surface, all but one of said playing pieces being of lengths substantially twice as great as their widths, and said last mentioned playing pieces having rounded ends and cooperative lateral recesses to permit certain predetermined turning movements of the pieces.

3. A puzzle comprising a support having a playing surface, playing pieces resting on the surface for movement from one group arrangement to another without being lifted from the surface, certain of said playing pieces being composed of peripherally joined circular end portions and having lateral recesses intermediate said portions whereby the end portions of certain pieces may engage in recesses of other pieces to thereby permit turning movements of certain of the playing pieces when working the puzzle.

4. A puzzle having a restricted playing surface and a series of playing pieces movable about on the surface, said pieces being of greater length than width and having substantially circular integrally connected end portions, with lateral recesses in the playing pieces intermediate the end portions.

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