July 4, 1944. W. R. IRWIN 2,353,037

PUZZLE

Filed March 17, 1942 2 Sheets-Sheet 1

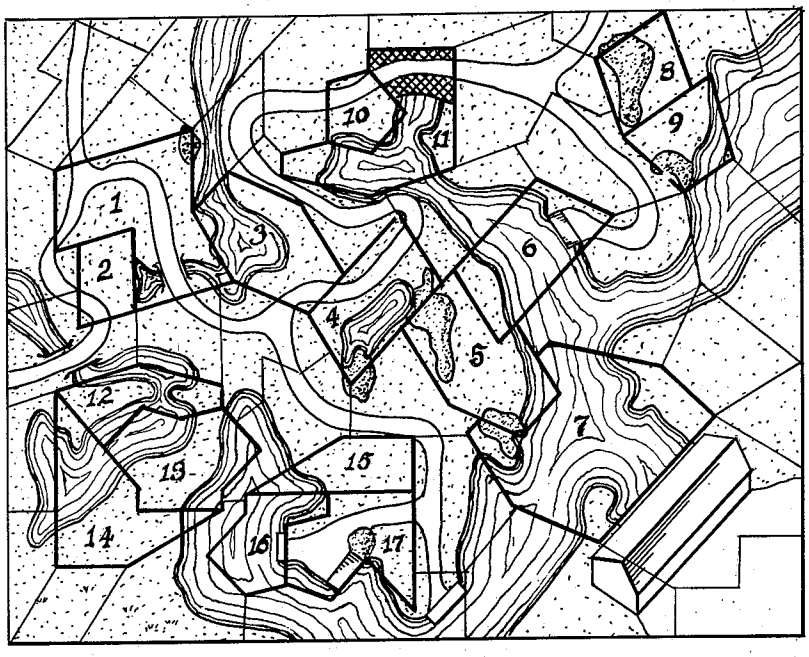


Fig. 1

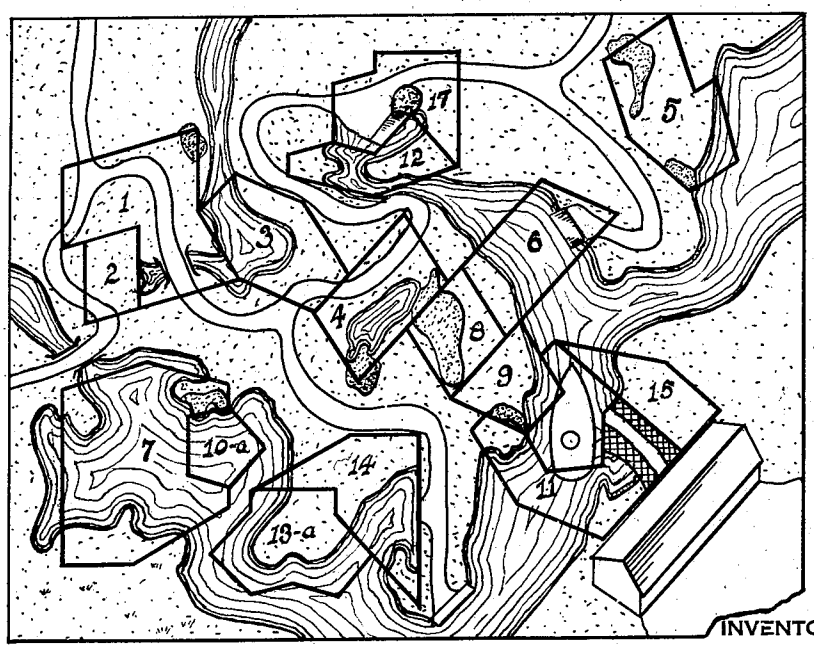


Fig. 2

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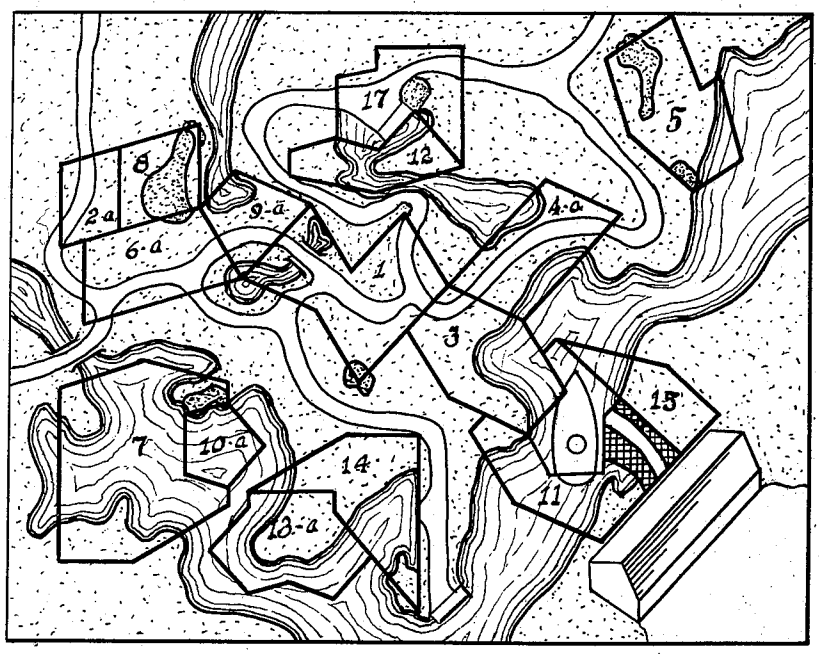


Fig. 3

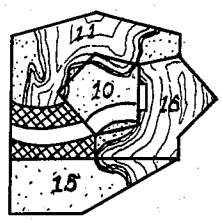


Fig. 4

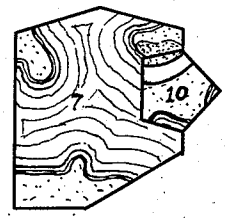


Fig. 5

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Patented July 4, 1944 2,353,037

UNITED STATES PATENT OFFICE

2,353,037

PUZZLE

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Application March 17, 1942, Serial No. 435,102

3 Claims. (Cl. 273—157)

This invention relates to a game or puzzle and more particularly to a cut-out or jigsaw type of puzzle composed of interfitting parts adapted to be disposed in predetermined arrangement whereby a plurality of different designs, pictures or other graphic representations may be produced.

One of the objects of the present invention is to provide a puzzle of the character referred to which will be both entertaining and instructive and which will provide a novel departure from the usual type of jigsaw puzzle.

Another object is to produce such a game or puzzle which has a plurality of possible solutions and in which different results may be produced with each of such solutions.

A further object is to provide a device of the above type in which the conversion of the picture design or other graphic representation from one form to another requires a considerable degree of skill and ingenuity.

A still further object is to provide a puzzle composed of a multitude of parts adapted to be arranged in a plurality of different juxtaposed physical interfitting relationships, said parts being provided on one or both sides with markings and/or coloring of such nature and arrangement that in each of said different physical arrangements of the parts, said markings and/or coloring will produce a different, continuous and comprehensible graphic representation.

Other objects and advantages will hereinafter appear.

In accordance with the present invention I so shape and arrange the component parts of the puzzle or game that they may be fitted together within the same marginal confines or frame in a plurality of different relative positions and provide the parts with such markings and/or coloring that in each of a plurality of different arrangements of the parts a complete picture, design, or other graphic representation will be produced. The components of the puzzle may be so arranged that the transition from one picture or design to another may be effected by a transposition of all or of a portion only of the interfitting elements of the puzzle and the transposition may occur in one area only of the puzzle or in a plurality of areas of the puzzle. The transposition of parts, moreover, involves a regrouping of the parts to be moved among themselves, as well as a change in their relative position in the picture area. In other words, in an alteration occurring in one portion of the puzzle requiring the removal of one or more parts and the replacement thereof by several other of the elements of the puzzle, such replacement parts may be obtained from spaced portions of the puzzle or they may be contiguous parts but having a different contiguous relationship in their new position. Some of the parts may also be used either side up and may be differently oriented in the different positions they occupy in composing the various pictures, designs, etc.

The invention will be best understood by reference to the accompanying drawings in which:

Fig. 1 is a plan view of an assembled puzzle embodying the present invention and showing one arrangement of the parts, producing a composite picture;

Fig. 2 is a similar view showing a second arrangement of the parts, producing a modified picture;

Fig. 3 is a further view showing a third arrangement of the parts to produce still another picture; and

Figs. 4 and 5 are views of a group of puzzle parts disclosing an arrangement thereof which produces a correct interfitting of the parts but which lacks continuity of the picture or design.

Referring first to Fig. 1 it will be noted that I have produced a puzzle composed of a multitude of interfitting elements which compose to a rectangular shape and which bear markings thereon which produce a definite and continuous picture or design. In the embodiment shown a number of the parts, shown in light outlines, retain the same relative positions in all arrangements of the parts and a further number of parts, shown in heavy outline and bearing reference numerals 1 to 17, are subject to change in their positions relative to each other and to the fixed parts of the puzzle in order to produce a modified picture or design. It will be understood, of course, that any number of the parts, including all, may be made subject to rearrangement to produce the alternative pictures or designs.

In Fig. 1 the changeable parts are shown as disposed in five discrete groups, composed respectively of parts 1 to 7; 8 and 9; 10 and 11; 12 to 14; and 15 to 17. Each of these groups, it will be noted, are of distinctive and individual configuration and no two of the numbered parts are identical in size and shape. As a consequence any effort to exchange any two parts or any two groups of parts is thwarted and it becomes necessary to break up and redistribute the components of each group in order to modify the picture.

In Fig. 2 I have shown one such redistribution in which a change of position occurs in all of the

illustrated groups of movable parts. In this arrangement the pieces numbered 1 to 4 and 6 of group 1 remain in their original position, all of the other numbered pieces taking part in the modification of the picture. The place vacated by parts 5 and 7 in Fig. 1 is occupied in Fig. 2 by parts 8, 9, 11, 15 and 16a, part 16a being the reverse side of part 16. Likewise, the space vacated by parts 8 and 9 in Fig. 1 is occupied by part 5; the space vacated by pieces 10 and 11 is occupied by pieces 12 and 17; the space vacated by pieces 12, 13 and 14 is filled by pieces 7 and 10a, the latter piece being the reverse side of part 10; and the space vacated by parts 15, 16 and 17 is filled by parts 13a and 14, where 13a is the reverse side of part 13.

It will be noted that in this redistribution of parts the space vacated by certain parts, 10 and 11 for instance of Fig. 1, is filled by a plurality of parts, 12 and 17 in the example given, taken from separated areas of the puzzle. These parts 12 and 17 while combining to fill the same space as parts 10 and 11, widely differ from the parts 10 and 11 in their individual shapes. Likewise, the parts 10 and 11 which were replaced by the parts 12 and 17 are broken up and redistributed, part 10 being used in reverse, as 10a, in one group and part 11 being used in an entirely different group. It should also be noted that certain of the parts are oriented through different angles in the arrangement of Fig. 2 as compared to that of Fig. 1, part 11 for instance being oriented through an angle of approximately 45° and part 12 being oriented through an angle of 180°. Parts 10 and 13, as stated, have their sides reversed. Since these parts are symmetrical, the only effect of the reversal of sides is to modify the graphic representation. Part 16, however, is asymmetrical in form and must be reversed in order to fill the space for which it is destined.

It should be further noted, in the arrangement of Fig. 2, as well as in Fig. 3, presently to be described, that a new design or picture has been formed, differing from that of Fig. 1 but without effecting any change in the size or shape of the periphery or confines of the composite puzzle. While no effort has been made to do so in the instant embodiment, it will be understood that the parts may be arranged and marked to produce a game in which the aim, for instance, may be to advance an object, such as a boat, through the various waterways, or a car over the various roadways.

In Fig. 3 a further rearrangement is shown. In this figure the parts 5; 12, 17; 11, 15, 16*a*; 7, 10*a*; and 13*a*, 14 remain as in Fig. 2 and the parts 1 to 4, 6, 8 and 9 have been rearranged in the same general space which they occupy in Fig. 2. For instance, the space occupied by parts 1 and 2 in Fig. 2 is occupied by parts 2*a*, 6*a*, and 8 in Fig. 3, the parts 2*a* and 6*a* being the reverse side of parts 2 and 6, respectively. The space occupied by parts 3 and 4 in Fig. 2 is occupied in Fig. 3 by parts 9*a* and 1, 9*a* being the reverse side of part 9. Likewise the space occupied in Fig. 2 by parts 6, 8 and 9 is filled in Fig. 3 by parts 3 and 4*a*, the latter part being the reverse side of part 4.

It will be noted that the picture produced in the arrangement of Fig. 3 is different from that of either Figs. 1 or 2. It may also be stated that the specific arrangements shown do not exhaust the possible arrangements of the particular parts shown.

It will be noted that the group of parts numbered 1 to 6, 8 and 9 are composed of three basic parts 2, 8 and 9 combined in various ways to form the remaining parts 1, 3, 4, 5 and 6. For instance, the part 1 is composed of parts 2, 8 and 9, part 3 is composed of part 9 in two different positions; part 4 is made up of parts 2 and 8; part 5 is composed of parts 8 and 9; and part 6 is composed of parts 2 and 9. As a result of this formation of the larger parts by combinations of the basic parts, it is possible to replace any one of the combined parts either by basic parts alone or combinations of combined parts or combined and basic parts. For instance, the space occupied by part 1 (composed of basic parts 2, 8 and 9) may be occupied by the three basic parts 2, 8 and 9 or by the part 4 which is composed of parts 2 and 8 and part 9, or it may be occupied by parts 2 and 5, the latter part being composed of parts 8 and 9. Likewise, the space occupied by parts 1 and 2 in Fig. 1 may be filled in a variety of ways. This space is composed of two areas of part 2, and one area of each of parts 8 and 9. It may be occupied, as in Fig. 1, by parts 1 and 2 or, as in Fig. 3, by parts 2, 6 and 8, part 6 being composed of parts 2 and 9. Likewise, it might be occupied by parts 4 and 6, the former composed of parts 2 and 8 and the latter of parts 2 and 9. It may also be occupied by parts 2, 9 and 4, the latter being composed of parts 2 and 8. Similarly, other areas occupied by combined parts or combinations of parts may be occupied by different combinations of parts as long as the latter parts contain the same number of basic elements as those removed from such area. By this use of basic parts and combined parts formed from such basic parts, a comparatively large number of distinctively shaped parts may be produced, none of which are directly interchangeable with others but which permit a variety of rearrangements to be effected in a planned and orderly fashion. Similarly, the parts 7 and 10 to 17 are composed of basic and combinations of basic parts to produce a large number of distinctively shaped parts.

In Fig. 1 I have shown that portion of the puzzle in which no change occurs, as divided into a number of interfitting parts, and in Figs. 2 and 3, in order to better indicate only those parts in which movement is effected to produce a different picture, I have shown the remainder of the puzzle as a solid matrix. It is to be understood, however, that the puzzle may be produced in either form, that is, with such portion as a solid matrix or as a plurality of interfitting parts.

In Figs. 4 and 5 I have shown, by way of example, incorrect arrangements of the movable parts to form one of the groups. The space occupied by parts 12, 13 and 14 of Fig. 1 is occupied by parts 10, 11, 15 and 16 in Fig. 4 and by parts 7 and 10 in Fig. 5. It will be noted that both arrangements satisfy the physical limitations of size and shape but fail to produce a continuous design or picture. Other erroneous arrangements may be made in the other groups. This possibility of obtaining a correct physical arrangement without continuity of the picture or design renders the correct solutions more baffling and adds considerable interest to the puzzle. In addition, it permits the puzzle to be packed for merchandizing in an assembled form in a suitable box or other container without showing any of the possible solutions. This feature is important since the assembled parts pack into a more confined space and in a more orderly arrangement than the jumbled pieces and enable the pur-

chaser to observe at a glance that no parts are missing. In the manufacture of the puzzle, the elements of the picture, design, etc., may be printed in accordance with this incorrect arrangement and the cutting of the parts effected in a single punching operation, thus requiring no subsequent assembling of the pieces.

It will be noted, in the embodiment shown, that certain of the pieces have been used with the reverse side up in producing the different pictures. It is to be understood that this is by way of illustration only to show the possible variations to which the puzzle is susceptible. If desired, the markings may be provided on one side only of the parts and so arranged that all of the parts will be invariably used with the same side uppermost.

While the puzzle has been disclosed as composed of straight-sided parts, it is to be understood that a similar result may be obtained with parts having undulated or curved contours or a combination of curvilinear and straight margins. It will be further understood that the particular sizes and shapes of parts shown is by way of example only and that innumerable other arrangements and shapes of parts may be used with any desired graphic representation. I do not desire, therefore, to be limited to the particular form of physical and picture parts shown but contemplate all variations thereof coming within the terms of the appended claims.

What I claim is:

1. A game or puzzle comprising a plurality of interfitting parts having markings or coloring disposed thereon in such manner that when all of the parts are correlated within a definite confine to form a continuous surface, said markings or coloring produce a comprehensive design, picture or other graphic representation, some of said parts being differently shaped to form a plurality of basic parts and other of said parts being shaped to conform to different combinations of said basic parts to form a plurality of combined parts, whereby the same position within the confines of the puzzle may be occupied either by a plurality of contiguous basic parts or one or more of the combined parts, the marking or coloring on said basic and combined parts being of such nature that a different comprehensive picture, design or graphic representation is obtained in the different relative arrangements of said parts within said confines.

2. The combination as set forth in claim 1 wherein certain of said parts have markings or coloring on both sides thereof, whereby said certain parts may be used with one side uppermost in one of said plurality of positions and with the opposite side uppermost in a different one of said plurality of positions, to form said comprehensive picture, design or graphic representation.

3. A game or puzzle comprising a plurality of interfitting parts having markings or coloring disposed thereon in such manner that when all of the parts are correlated within a definite confine to form a continuous surface, said markings or coloring produce a comprehensive design, picture or other graphic representation, some of said parts being differently shaped to form a plurality of basic parts and other of said parts being shaped to conform to different combinations of said basic parts to form a plurality of combined parts, whereby the same position within the confines of the puzzle may be occupied either by a plurality of contiguous basic parts or one or more of the combined parts, the marking or coloring on said basic and combined parts being of such nature that a different comprehensive picture, design or graphic representation is obtained in certain different relative arrangements of said parts within said confines and in other relative arrangements of said parts within said confines the picture, design or graphic representation is arranged incongruously whereby said puzzle may be packed in assembled form without displaying the complete picture, design or graphic representation.

WILLIAM R. IRWIN.