# United States Patent

[11] 3,632,111


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[21] Appl. No. **799,352**
[22] Filed **Feb. 14, 1969**
[45] Patented **Jan. 4, 1972**
[32] Priority **Feb. 15, 1968**
[33] **Great Britain**
[31] **7,344/68**


[54] **BINARY ARITHMETIC BOARD GAME APPARATUS**
**7 Claims, 3 Drawing Figs.**


[52] **U.S. Cl.** ..... **273/131 K**
[51] **Int. Cl.** ..... **A63f 3/02**
[50] **Field of Search** ..... 273/131



[56] **References Cited**

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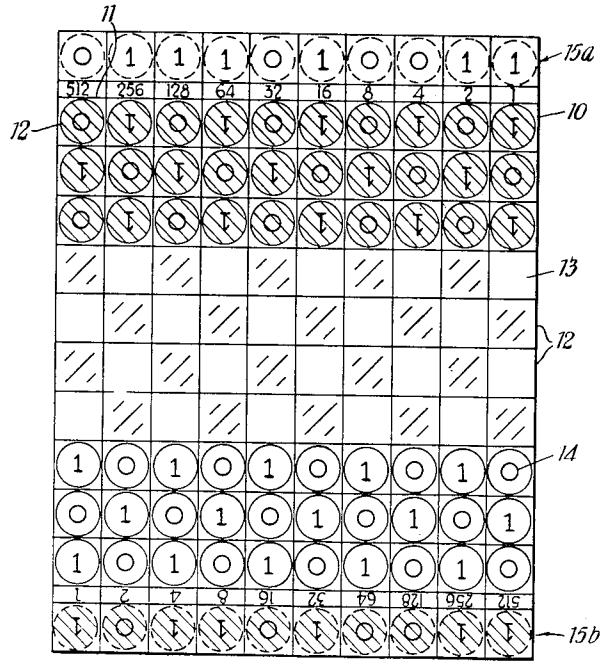
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**ABSTRACT:** This invention relates to a board game which can be played by two or more players using counters on a board which is divided into discrete playing areas, such as a checkerboard design, for example. Each player moves one of his counters in turn towards his opponent's end of the board and, where the resulting pattern formed by both sets of counters allows, binary arithmetical operations are performed on the combination of his own and his opponent's counters to enable the player to improve the value and interim position of his own counters. The aim of each player is to move his own counters into a predetermined pattern on his opponent's side of the board.

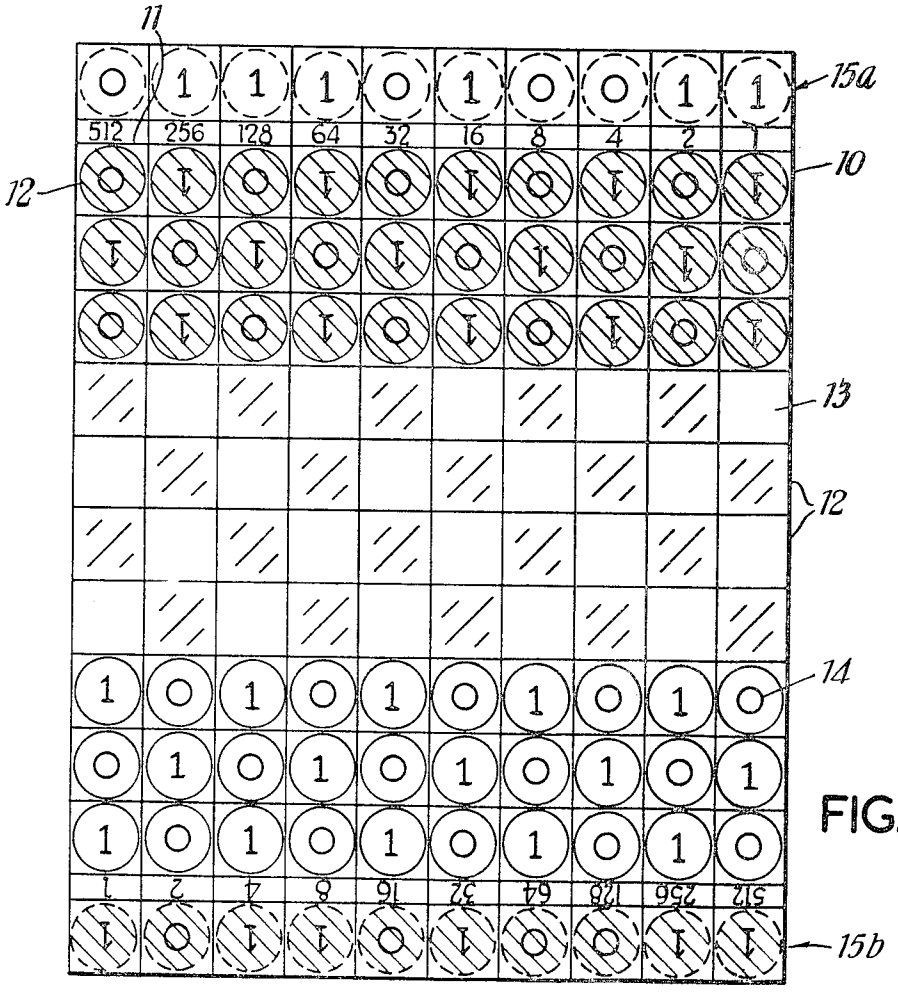
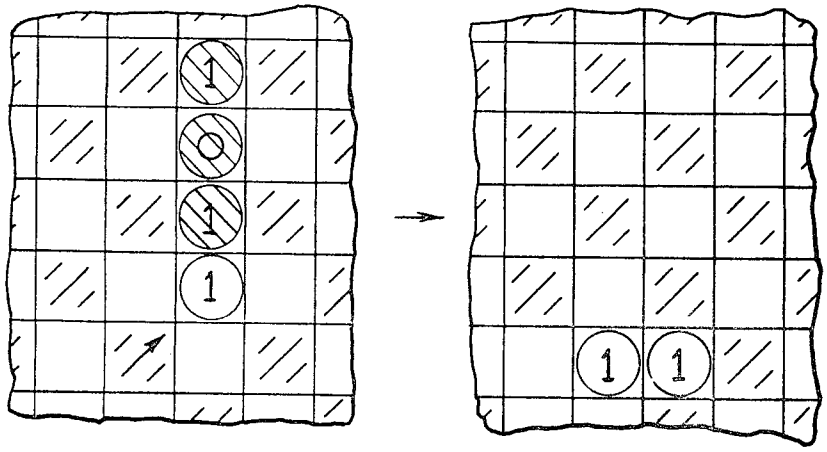



FIG. 1



(a) FIG. 2 (b)

# BINARY ARITHMETIC BOARD GAME APPARATUS

## BACKGROUND OF THE INVENTION

Board games are known in which each player moves his playing counters across a checkeredboard and aims to maneuver his own counters into a position relative to his opponent's counters where he will be able to "take" his opponent's counters and remove them from the board. In the game according to the present invention the same technique is involved except that both the player's and his opponent's counters are removed from the board at a "take" and replaced by a combination of the player's counters which is the result of a binary arithmetic operation performed on the combined set of counters.

## SUMMARY OF THE INVENTION

This invention relates to a board game comprising a playing board having a playing surface divided into discrete areas arranged in rows and columns, two sets of counters, the counters of each set being identifiable by a first common characteristic and being divided into two groups each identifiable by second and third common characteristics, said second and third common characteristics being common to both sets, whereby counters from both sets disposed in a column can be treated by binary arithmetic and so replaced by a plurality of counters arranged in a row.

## DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings in which:

FIG. **1** shows a board with the pieces in position at the commencement of play.

FIGS. **2***a* and **2***b* show a section of the board illustrating an example of sequential positions of the playing pieces during play.

## DETAILED DESCRIPTION OF THE INVENTION

In the embodiment shown in FIG. **1**, the game is played on a board **10** which is divided into ten columns **11** and ten rows **12**. A series of square playing areas **13** are formed by the intersecting columns and rows, and these areas **13** are preferably arranged in a checkerboard design, e.g., alternately black and white.

Two sets of different colored counters **14** are used. These counters can either be flat disks (as illustrated), or rectangles or may be other forms of three-dimensional pieces. Half the counters **14** in each set are marked with the numeral "1" and the other half with the numeral "0." The counters **14** are initially set out on the board **10** with the "1" marked counters on, for example, the white squares **13** and the "0" counters on the black squares **13**. Only the first three rows **12** on each side of the board are set out with counters **14**, as shown.

The aim of each player is to move as many of his own counters as he can across the board into a predetermined final position on his opponent's side of the board. Each player moves in turn towards his opponent's end and, where the resulting pattern formed by both sets of counters allows, binary arithmetical operations are performed on the combination of his own and his opponent's counters to enable a player to improve the value and interim position of his own counters.

An example of such play is described with reference to FIGS. **2***a* and **2***b*.

Starting with the counters laid out on the board as shown in FIG. **1**, each player in turn moves one of his counters diagonally towards his opponent's side of the board. In FIG. **2***a* the position where one player has moved one of his counters into a position beneath a column of three of his opponent's counters. This combined column of counters is known as a counter run and can consist of any number of counters from two to nine.



When a player forms such a run he may then perform a binary arithmetical operation on the combined counters and replace the run by a resultant pattern of his own counters. In the example illustrated, the binary operation performed is that of addition. The result of adding the binary number formed by his opponent's counters and the "1" of his own counter, is "11" in binary arithmetic, and this result is placed in the squares below the counter run on the player's side. The added up run is then taken off the board and the counters returned to the player's and the opponent's counter stores, the result of the operation appearing as shown in FIG. **2***b*.

In this way players can alter the position and increase the number of their counters in play, reduce the number their opponent has in play and open up paths to the agreed pattern position for their own counters.

As an example of the way in which the aimed at final pattern position for the counters may be chosen, before play begins each player draws at random ten of his opponent's counters and places one at the rear of each of the columns **11** below his own back row **12**. Thus each player has facing him at the heads of the columns **11**, a sequence of his own counters which form a 10-bit binary number. Examples of such numbers are shown at **15***a* and **15***b* in FIG. **1**. The aim of each player is then to get as many as possible of his counters marked "1" in the back row of his opponent's side of the board, in positions which match with the "1" counters in the 10-bit binary number.

Play ends when one player has completed his objective or cannot move on his turn. The winner is the player whose matching "1" counters on his opponent's back row form the highest value number. As shown in FIG. **1**, the equivalent decimal value of each of the columns **11** is preferably indicated at the head of each column to facilitate the task of computing the value of the number formed by each player's matching "1" counters to determine the winner. These decimal values are equal to $2^0$, $2^1$, $2^2$, $2^3$, etc., reading from right to left.

Alternatively, the game may be played where the aim of each player is to fill the back row on his opponent's side of the board with his own "1" counters. The winner in this case is the player who first achieves the chosen pattern or who at the end of play, which occurs when one player is unable to move at his turn, has the greater number of "1" counters in position.

The binary operation performed on the counter runs when they are formed is not restricted to that of addition. The operation of subtraction, multiplication or division can equally well be applied and the resultant answer substituted for the counter run as described.

A variation would be to allow the substitution of computer codes for normal binary arithmetic operations on the counters and to award special values or privileges to counters which attain certain positions on the board.

Lastly, it is of course not essential that the counters only be moved diagonally as each player has his turn. Equally possible is for the counters to be moved forwards and sideways.

I claim:

**1**. A board game comprising a flat playing board having a playing surface divided into a plurality of discrete areas; at least two sets of movable counters, adapted to be moved along the surface of said board from one discrete area to another to form predetermined patterns of said counters, consisting of counters having a first, identifiable characteristic on each of said sets, adapted to distinguish one set from the other, and a second, and a third, identifiable characteristic only on each of said sets of counters which are common to all sets, each of said pieces in each of said sets bearing one or the other of said second and third characteristics; whereby said counters, when moved along said board from one discrete area to another, are adapted to form groups of counters of all of said sets of counters which represent binary arithmetic combinations.

**2**. A board game in accordance with claim **1** wherein the discrete areas are arranged in rows and columns and said columns on said board are designated decimal numerical

values equal to powers of two increasing from one vertical edge of the board to the other.

3. A board game in accordance with claim 1 wherein the second and third identifiable characteristics are binary arithmetic symbols.

4. A board game in accordance with claim 1 wherein said second and third identifiable characteristics are 0's and 1's.

5. A board game in accordance with claim 1 wherein the first characteristic distinguishing the sets of counters is color.

6. A board game in accordance with claim 1 wherein the discrete areas of the playing surface are alternate areas of contrasting color.

7. A board game in accordance with claim 1 wherein the discrete areas are arranged in rows and columns having an equal number of discrete areas and an additional row of discrete areas and an additional row of discrete areas is provided at opposite sides of the playing surface, each said row to receive counters having one or the other of the first identifiable characteristic.

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