

United States Patent

Henshaw

[15] 3,661,391

[45] May 9, 1972

[54] **VARIABLE PATTERN THREE-DIMENSIONAL GAME BOARD**

[72] Inventor: **John M. Henshaw**, Salina Star Route, Boulder, Colo. 80302

[22] Filed: **Mar. 2, 1970**

[21] Appl. No.: **15,614**

[52] U.S. Cl. **273/131 A, 273/131 AC, 273/136 A**

[51] Int. Cl. **A63f 3/02**

[58] Field of Search **273/130, 131, 136**

[56] **References Cited**

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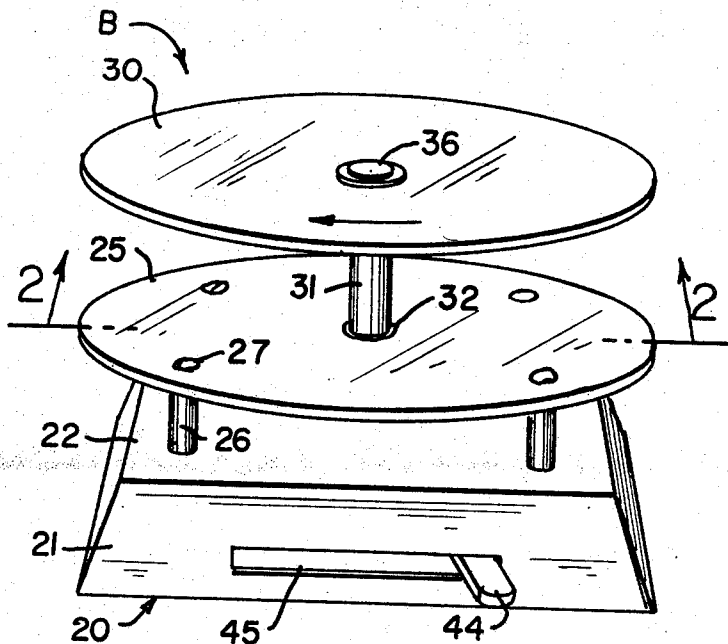
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Primary Examiner—Delbert B. Lowe
Attorney—Van Valkenburgh and Lowe

[57] **ABSTRACT**

A game board having a plurality of decks one above the other with correlated markings upon the decks to permit a game to be played on both decks. The decks are shiftable with respect to each other so that the relative position of the markings of one deck will change with respect to the markings of the other deck in accordance with a selected pattern. In the preferred embodiment of this invention, the decks are made symmetrical about a common axis in order to effect the shifting action by rotation of one deck with respect to the other. This rotation of one deck with respect to the other is effected through a ratchet mechanism to permit the rotation to be stepwise to maintain the correlation of one deck with respect to the other at all positions.

6 Claims, 13 Drawing Figures



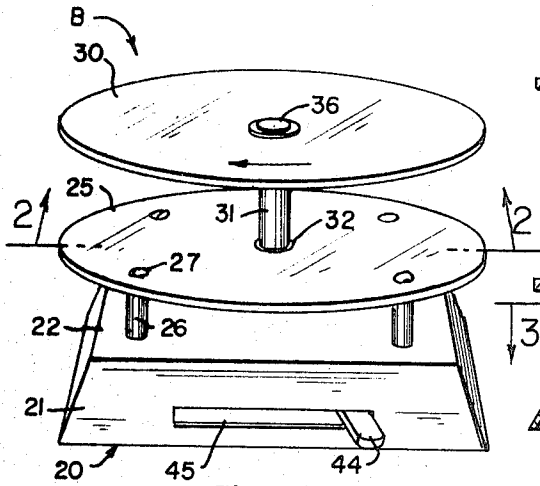


Fig. 1

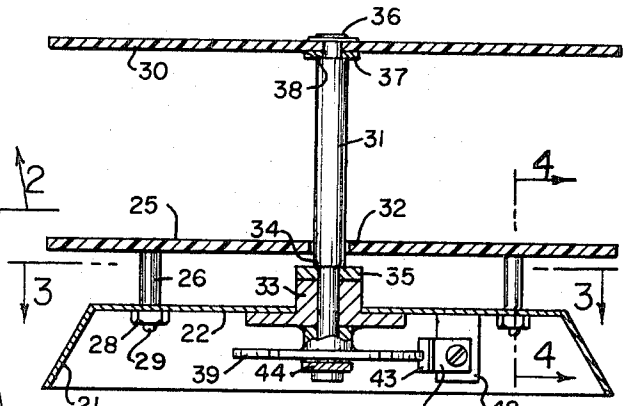


Fig. 2

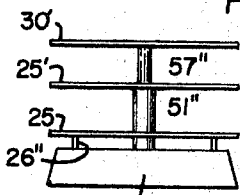


Fig. 12

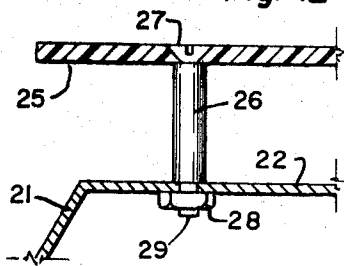


Fig. 4

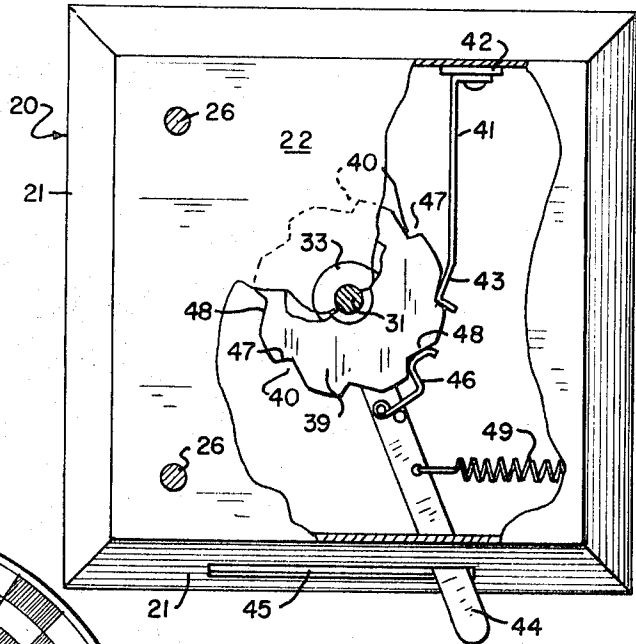


Fig. 3

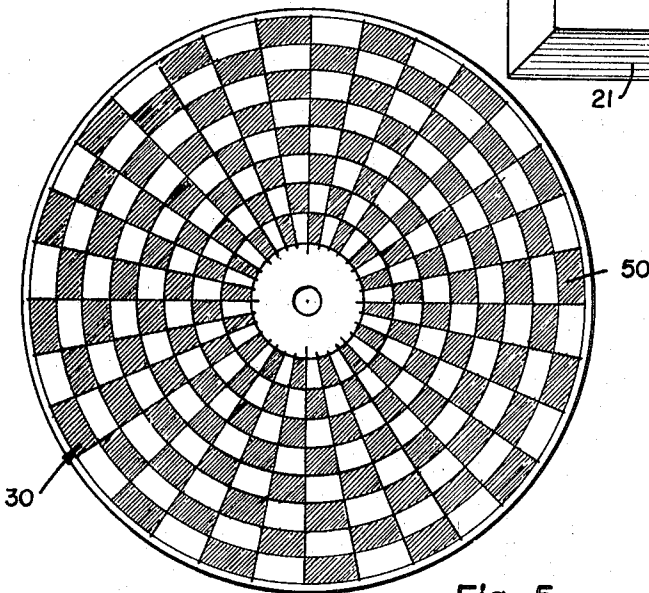


Fig. 5

INVENTOR.
John M. Henshaw
BY
Van Valkenburgh & Howe
ATTORNEYS

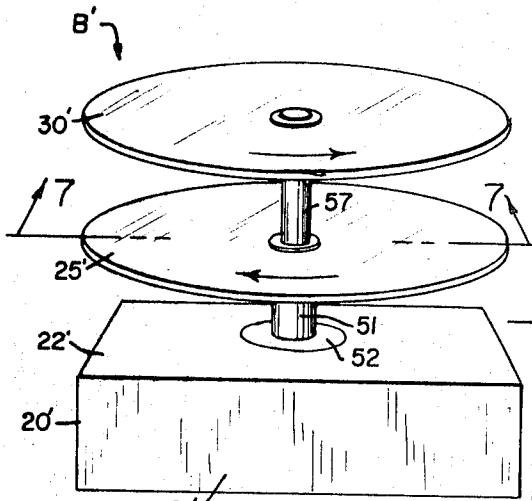


Fig. 6

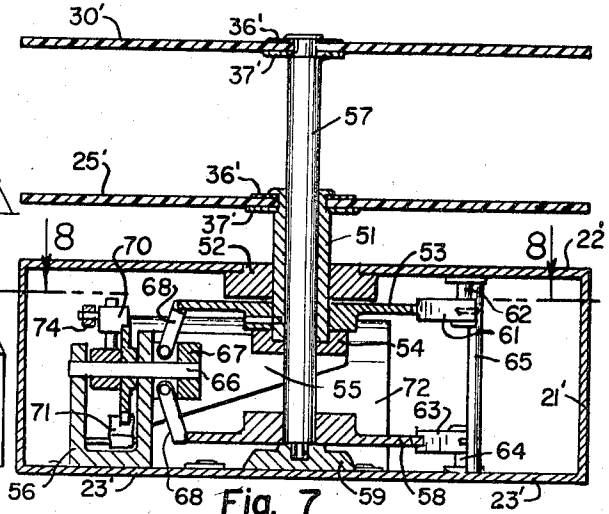


Fig. 7

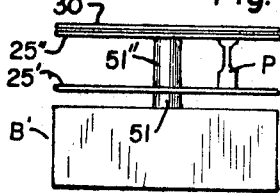


Fig. 13

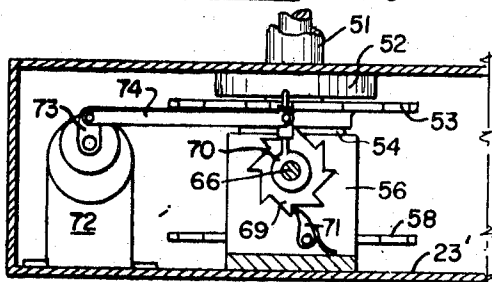


Fig. 9

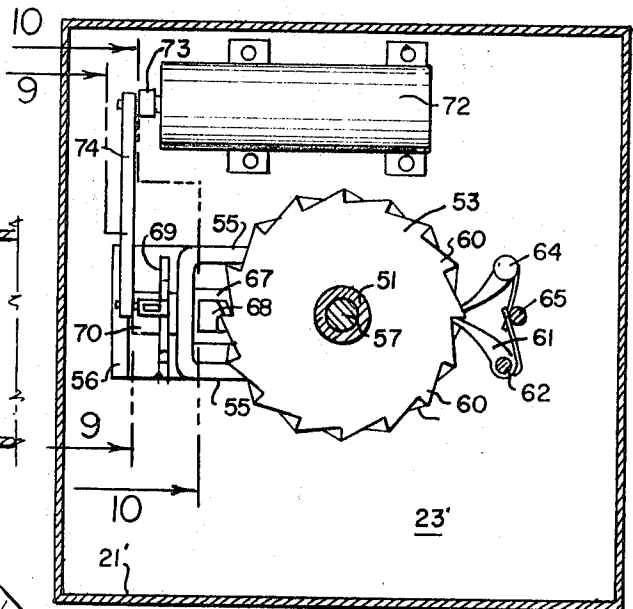


Fig. 8

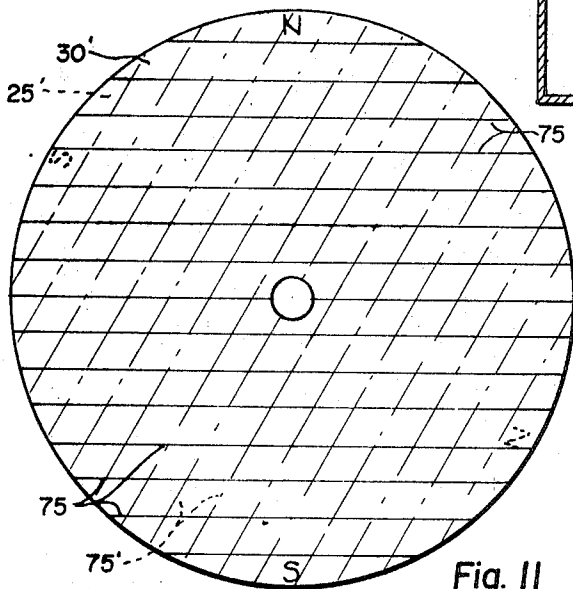


Fig. 11

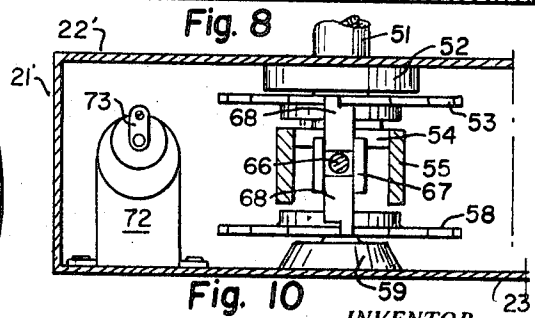


Fig. 10

INVENTOR.

John M. Henshaw
BY Van Valkenburg & Fouse

ATTORNEYS

VARIABLE PATTERN THREE-DIMENSIONAL GAME BOARD

This invention relates to game boards, and more particularly to multi-level game boards, a primary object of the invention being to provide a novel and improved construction of a multi-level game board wherein the relative positions of two or more decks, constituting the game board, are shifted according to a selected pattern to broaden the scope and complexity of playing the game.

Another object of the invention is to provide, in a game board of the type wherein the play may be accomplished by moving pieces over squares or along a specified course, a combination of two or more interrelated game board decks in a shiftable, multi-level arrangement.

Another object of the invention is to provide in a multi-level game board, a further variable in the field of play, namely the shifting or rotating of one board with respect to another.

Another object of the invention is to provide, in a multi-level game board of the type commonly referred to as a three-dimensional game board, an arrangement for shifting one deck of the game board with respect to another in a predetermined or selected pattern, to provide a further dimension in the scope of play.

A further object of the invention is to provide, in a three-dimensional game board, an arrangement for shifting the alignment of one deck of the board with respect to another in a sequential, timed manner to provide another variable of play.

A further object of the invention is to provide a multi-level game board having one deck shiftable with respect to the others to permit not only the play of a game using the variations possible with the multi-level arrangement of boards, but also a play with respect to time as effected by periodic shifting of one board with respect to the others, the same providing an educational device peculiarly adapted to permit a player to visualize situations in a broader and more realistic aspect.

A further object of the invention is to provide, in a multi-level game wherein one deck is adapted to shift with respect to the other, a simple, neat appearing, economical unit which is especially versatile in that the same way be used for very simple, easily-played games, or used for complicated games requiring considerable skill and study.

With the foregoing and other objects in view, my invention comprises certain constructions, combinations and arrangements of parts and elements as hereinafter described, defined in the appended claims, and illustrated in preferred embodiment in the accompanying drawing in which:

FIG. 1 is a perspective front view of one form of a multi-level game board having a rotatable deck and a stationary deck to depict a simple form of the apparatus.

FIG. 2 is a sectional elevation view of the apparatus, as taken from the indicated line 2—2 at FIG. 1.

FIG. 3 is a plan view of the apparatus, partly in section, as from the indicated line —3 at FIG. 2, but with portions broken away to show parts otherwise hidden from view and with broken lines depicting portions of parts hidden from view.

FIG. 4 is a fragmentary sectional detail as taken from the indicated line 4—4 at FIG. 2, but on an enlarged scale.

FIG. 5 is a plan view of a deck of the game board with markings thereon which are of a type suitable for games analogous to chess and checkers.

FIG. 6 is a perspective view similar to FIG. 1, but of a modified form of the apparatus, using two rotatable decks.

FIG. 7 is a sectional elevation view of the apparatus as taken from the indicated line 7—7 at FIG. 6.

FIG. 8 is a sectional plan view as taken from the indicated line 8—8 at FIG. 7.

FIG. 9 is a fragmentary sectional view as taken from the indicated line 9—9 at FIG. 8.

FIG. 10 is a fragmentary sectional view as taken from the indicated line 10—10 at FIG. 8.

FIG. 11 is a plan view of a game board similar to FIG. 5, but with an arrangement of lines across the top deck, and, as

shown in broken lines, a like arrangement of lines across the lower deck oriented in a different direction, the same being suitable for the play of a simple game as hereinafter described.

FIG. 12 is a side elevation view, on a greatly reduced scale, of a unit similar to the unit shown at FIG. 6, but modified to include a fixed deck such as shown at FIG. 1 to provide for a three level game board illustrative of yet another arrangement embodying the invention.

FIG. 13 is a side elevation view, on a greatly reduced scale, of a unit similar to the unit shown at FIG. 6, but modified by providing a spool-shaped arrangement consisting of a lower deck, a shaft extension therefrom and an upper disc above the lower deck with the upper disc being placed adjacent to the upper deck to eliminate parallax when looking through the upper deck and showing the form of a play piece on the lower deck for the same purpose.

There is a widespread desire to enhance the complexity of various conventional and classical games such as checkers and chess without merely increasing the spaces wherein a move is possible. There is also a desire for game boards which permit games to be played differently from the manner in which they are ordinarily played. To meet this desire, three-dimensional game boards have been developed where one deck is above the other such as in the manner illustrated in the U.S. Pat. No. 3,464,701. In such a game, the players will use both decks in moving in selected manners. However, after the player has become thoroughly familiar with such a three-dimensional game, he finds that the problems encountered in the play of the game, though more extensive because more spaces for moving the pieces are available, are not greatly different from the games on a single deck board.

The present invention was conceived and developed with the above considerations in view, and especially to satisfy the desire to provide a game of increased complexity without merely increasing the number of play spaces and also to provide a game wherein a continuing change of situations arises which may involve the dimensions of time. The invention comprises, in essence, a game board having two or more decks. The markings on the decks, to specify the course of play, are interrelated with each other to permit a play between the decks according to specified rules. Also, the boards are shiftable, one with respect to the other, in such a manner as to change the relationship of markings of one board with respect to the other. To best accomplish this, the decks are arranged to be symmetrical about a common polar axis so that the shifting is accomplished by rotating one deck with respect to the other.

Referring more particularly to the drawing, the game board B, shown at FIGS. 1 through 4, represents a simplified arrangement of a multi-level game which embodies the invention. The unit, preferably square in plan, includes a base 20 which may be a box-like enclosure having sidewalls 21 and a top 22. A first playing deck 25 is affixed to and is supported upon and above the base by an array of posts 26 upstanding from the top 22. The play deck 25 is a flat, circular member preferably formed of a sheet of plastic and each post 26 is secured to the underside of this deck as by a flat head screw 27 extending through the deck and into the post. The post is secured to the top 22 by a nut 28 threaded upon the end 29 of the screw 27 which projects from the post and through a hole in the top 22.

A circular, upper deck 30 is disposed directly above the lower play deck 25 in common axial alignment therewith. This upper deck is preferably formed of a transparent rigid material such as an acrylic plastic resin. It is mounted upon an axial shaft 31 which depends from its underside to extend downwardly through an opening 32 at the center of the lower deck 25 and thence into a support bearing 33 secured to the top 22 of the base, the diameter of the shaft being reduced slightly at this bearing to provide for a shoulder 34 to retain a thrust washer 35 at the top of the bearing. The shaft 31 is connected to the upper play deck by a riveted head 36 which is reinforced by a washer 37 at its underside abutting against a

shoulder 38. The lower portion of the shaft, reduced in diameter slightly at the thrust washer 35, extends through the bearing 33 to carry a ratchet wheel 39, the hub of the same being pressed, pinned or otherwise secured onto the shaft in any suitable manner.

The ratchet wheel 39 is formed as a circular member having an evenly spaced series of notches 40 about its periphery, the number of notches being selected and being the same as or related to the number of divisions in a play deck. A resilient finger 41 is secured to a boss 42 at a sidewall member 21 of the base to bear against the ratchet wheel 39 to function as a holding pawl. Accordingly, the finger 41 includes a head 43 which normally lies in and is resiliently urged into a notch 40 of the wheel 39.

A shift lever 44 has one end pivotally attached to the bottom of the shaft 31 to extend therefrom with its end projecting through a slot 45 in the front sidewall 21 of the base 20. This shift lever carries a spring loaded detent 46 which is normally urged into a notch 40 to function as a shifting pawl as in the manner illustrated. The notches 40 in the ratchet wheel are formed with a shoulder side 47 and a flat side 48 to function the same as typical ratchet teeth, that is in such a manner as to lock the head 43 and the detent 46 against the shoulder 47, but permit the same to slide from the flat side 48. Accordingly, the lever 44 may be pulled from one side of the slot 45 to the opposite side to rotate the wheel 39, with the resilient arm 41 yielding to permit the head 43 to slide out of its notch 40 and to eventually fall into the next-in-notch on the wheel periphery. Return of the arm 44 is accompanied by the detent 46 moving out of its notch, while the wheel is held by the head 43. A spring 49, attached to the lever 44 and to a wall 21, returns the lever to its initial retracted position whenever it is released.

With the organization thus described, the game board is formed by two circular decks 25 and 30, one above the other and with the deck 30 being substantially transparent to permit the markings on that deck to overlie the markings on the deck 25. The markings of the two decks are necessarily interrelated and they may be arranged in various manners to permit different games to be played on the boards. For example, the markings on each deck may take the form of a circular checkerboard sequence 50 as illustrated at FIG. 5. This checkerboard sequence 50 is formed by arrays of radial and circumferential lines forming spaces analogous to common checkerboard squares, with the alternate cornering spaces being darkened as illustrated. The board can be used to play games similar to checkers and chess and following similar rules of play but with the use of two decks providing a three-dimensional feature to the game to render it more complex. In the present invention, the possible move combinations and position situations are rendered even more complex. In addition to moving the play pieces from one board to the other as well as upon the boards, the upper board will be periodically rotated with respect to the lower board as in the direction of the indicated arrow at FIG. 1. Such movement may be effected by shifting the lever 44 or by merely turning the upper deck manually.

Not only may games analogous to chess and checkers be played with this board, but other types of games may be devised and the rules of rotation of one board with respect to another may be varied as desired. For example, after each play the upper board may be rotated one-eighth of a revolution, or a similar amount depending upon the notches 40 in the wheel 39. The players may also make this movement after a selected time sequence or may rotate the board in lieu of a move.

The game board B' illustrated at FIGS. 6 through 10, depicts a unit constructed according to the principles of the invention wherein a lower play deck 25' rotates in one direction and the upper play deck 30' rotates in the opposite direction as indicated by the arrows at FIG. 6. Such rotation may be effected manually; however, the same is preferably effected mechanically. The unit is mounted upon a base 20' preferably a box-like unit having sidewalls 21'a top 22' and a bottom 23' this

base being shown as an enclosed unit square in plan. However, it is to be understood that the bottom, a aide or the top can be made separable from the other components in any suitable manner, not described, to provide for convenient assembly and disassembly of the unit.

The mechanism to rotate the board may be varied in many ways. One preferred mechanism is illustrated at FIGS. 7 through 10. In that arrangement, the lower deck 25' is mounted upon a hollow shaft 51 and is secured thereto by a washer 37' at the underside and with the top of the shaft riveted or upset as illustrated. This shaft 51 depends from the underside of the deck and extends into the base through a bearing 52, secured to the top of the base. This shaft connects with a ratchet wheel 53 within the base and extends thence into a thrust bearing 54 which is carried between cantilever arms 55 extending from a U-shaped bracket 56 at one side of the base as further described.

The upper deck 30' is mounted upon a shaft 57 and is attached to the shaft by a rivet 36' and washer 37' the same as heretofore described. The shaft 57 depends from the underside of the deck and extends downwardly through the hollow shaft 51, thence through a central opening in the thrust bearing 54. The lower end connects with a second ratchet wheel 58 having its teeth opposite those of the ratchet wheel 53. Thence a stub of the shaft extending below the ratchet wheel is fitted into a supporting thrust bearing 59 mounted upon the floor 23' of the base 20'.

Each ratchet wheel is formed with a sequence of teeth 60 at selected angular spacings such as $22\frac{1}{2}^\circ$ as illustrated. A holding pawl 61 extends from a support 62 at the top 22' of the base to engage a tooth of the ratchet 53 and a similar holding pawl 63 upstands from a support 64 at the floor of the base to engage a tooth of the ratchet 58, the springs of the pawls being held by a post 65 between the floor and the top of the base.

A driving mechanism is provided to automatically rotate the ratchet wheels 53 and 58 in opposite directions at selected timed intervals. This driving mechanism is carried upon a shaft 66 secured in bearings in the support bracket 56, which holds the shaft in a horizontal alignment between the ratchet wheels. One end of this drive shaft cantilevers from the bracket to carry a hub 67 whereon a pair of diametrically opposing driving pawls 68 are mounted with their outward ends engaging the teeth of the ratchet wheels 53 and 58 as the shaft is rotated. Rotation of the shaft 66 thus shifts the ratchet wheels at one-tooth intervals, in opposite directions, the arms of the pawls 68 being proportioned for this purpose.

The shaft 66 carries a driver ratchet wheel 69 between the legs of the U-bracket 56 which is turned by a reciprocating pawl 70 also carried upon the shaft 66 and adapted to engage the teeth of the ratchet wheel 69. A holding pawl 71 at the base of the U-bracket completes the driver assembly.

The driving mechanism for the pawl 70 is a motor 72 mounted within the base 20' alongside the ratchet wheels 53 and 58 which drive the decks 25' and 30'. This motor includes a crank arm 73 connected to a pitman 74 which, in turn, is connected to the pawl 70.

The operation of the apparatus may now be described. The motor 72, a small unit powered by a battery or any other power source, not shown, is adapted to rotate its crank 73 at a low rate of speed and with each revolution, it swings the pawl 70 to engage a tooth of the ratchet wheel 69 to move the ratchet wheel ahead one tooth notch. At the same time, the restraining pawl 71 prevents a back movement of the wheel 69. With each 180° rotation of the wheel 69, the pawl arm 68 engage the deck ratchet wheels 53 and 58 to turn these wheels a one-tooth space and to thereby rotate the upper and lower playing decks to new positions, with the rotation of the decks being in opposite directions as indicated by arrows at FIG. 6. Subsequently, the continued movement of the ratchet drive wheel 69 does not effect any further movement of the playing decks until that wheel has again rotated 180° . If alternate rotation of the two playing decks is desired, only one pawl arm 68 may be used. It is to be noted that with this arrangement, a

selected time interval will lapse between each movement of the playing decks depending upon the speed of the motor crank 73 and the number of teeth in the ratchet wheel 69.

FIG. 11 illustrates the upper deck 30' as being marked for a game using a sequence of parallel lines 75 across the deck to define a sequence of strips with one extreme designated N and the other extreme designated S. The under deck 25' is marked with a similar sequence of lines 75' to define another sequence of strips. The lines 75' are shown at FIG. 11 as dashed lines, to indicate that these lines are to be viewed through the upper deck 30'. In order to avoid parallax the decks may be moved closer together than the position illustrated at FIG. 7. As these decks rotate relative to each other, the relative positions of the parallel lines will intersect in different manners as indicated.

The game is played with one player having his pieces on the lower deck and another player having his pieces at the upper deck. The object of the game is to take turns to move the player pieces across the decks as from north to south on each deck, with each turn permitting a player to cross a line and to position his piece at any lateral point on the next strip. A partial rotation occurs after each play, and should any piece of a moving player fall into a strip which is within the confines of a strip on the other board occupied by a play piece of the other player, the play piece of the first player is captured. It is to be noted that at times when the lines 75 and 75' are essentially perpendicular to each other, there is little chance for capture of one piece by another, but when the lines swing to a position paralleling each other, the chance of capture is greatly increased, especially when a number of pieces are involved. At first it is quite difficult for a player to move a piece from one strip to another and then position his play piece laterally so that he will avoid capture. However, after skill in the play is attained, not only can a player locate positions of his play pieces on the strips which will avoid capture, but also he can position his pieces in such a way that in subsequent moves he can effect a capture of the opponent's pieces.

A further arrangement of the game apparatus B'' is illustrated at FIG. 12 where the apparatus shown at FIGS. 1 and 6 is combined to provide for a stationary lower deck 25 and movable upper decks 25' and 30' to form a three-deck structure. This structure is mounted upon a base 20'' with posts 26'' supporting the lower deck 25 and with shafts 51'' and 57'' supporting the upper decks 25' and 30'. The movement of the decks on this apparatus and the apparatus to move them are substantially the same as those heretofore described.

FIG. 13 is a modification of the apparatus to avoid problems created by parallax, that is where the relative positions of markings on the lower and upper decks are distorted because the player is not looking at the game board from a direction directly above the board. Using the apparatus B' illustrated at FIGS. 7 to 10, the lower deck 25' is complemented by a duplicate 25'' spaced above the deck 25' by a shaft extension 51'' and to a position directly underneath the upper deck 30'. The deck 25'' the duplicate 25'' and the extension 51'' thus form a spool-like structure. The markings on the duplicate deck 25'' will be the same as the markings of the deck 25' and will always be in the same position. Thus, it will be easy to compare the markings of the lower deck 25' with the markings of the upper deck 30'. To facilitate a further comparison, a play piece P on the lower deck may be sufficiently tall as to permit the top to be against the upper deck and thus permit a player to ascertain its position with respect to the upper deck even when viewing the decks from a side position.

I have now described my invention in considerable detail. However, it is obvious that others skilled in the art can build and devise alternate and equivalent constructions which are

nevertheless within the spirit and scope of my invention. Hence, I desire that my protection be limited, not by the constructions illustrated and described, but only by the proper scope of the appended claims.

I claim

1. A three-dimensional game board mounted upon a base, and comprising:

a. a pair of horizontally disposed decks, each having axially centered game play markings with the markings on both decks being uniform sector-patterns about the axial center whereby the markings of one deck are correlated with the markings of the other deck for the play of a game when one deck is positioned above the other in common axial alignment;

b. a first means upstanding from the base supporting the lower deck;

c. a passageway through the center of the lower deck;

d. a shaft upstanding from the base at the axial center of the two decks, extending through the aforesaid passageway and supporting the upper deck;

e. means at the base adapted to rotate the shaft and upper deck thereon with respect to the lower deck; and

f. stepping means associated with the rotating means to effect stepwise rotation of the shaft through an arc which is an integral multiple of the arc of a sector to maintain the aforesaid correlation of the markings of the two decks at various rotative positions as the shaft is rotated.

2. The game board defined in claim 1, wherein the upper deck is substantially transparent to permit the markings of the upper deck to be compared with the markings of the lower deck by viewing the same downwardly through the upper deck.

3. The game board defined in claim 2, including a supplementary deck affixed to the lower deck at a position above the lower deck and closely adjacent to the under surface of the upper deck, said supplementary deck having markings the same as the lower deck to thereby permit such markings to lie closely adjacent to the markings of the upper deck whereby to minimize parallax.

4. The game board defined in claim 1, wherein said stepping means includes a ratchet gear

5. The game board defined in claim 1, including:

a. a third deck having markings in a uniform sector-pattern correlated with markings of the other two decks for the play of a game when this third deck is positioned above the other two;

b. wherein the aforesaid shaft is hollow and a second shaft extends through the first to support the third deck;

c. means at the base adapted to rotate the second shaft and third deck thereon in a direction opposite to the direction of rotation of the first said shaft; and

d. means associated with the rotating means to rotate the second shaft through arcs which correspond to the aforesaid sectors.

6. The game board defined in claim 1, wherein:

said first means supporting the lower deck is an axially centered tubular shaft upstanding from the base; and means within the base adapted to rotate this shaft in a direction opposite to the direction of rotation of the aforementioned shaft supporting the upper deck; and

stepping means associated with the last mentioned rotating means to effect stepwise rotation of the tubular shaft through an arc which is an integral multiple of the arc of a sector to maintain the aforesaid correlation of markings of the two decks at various rotative positions.

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