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[54] **AUTO-CHESS APPARATUS AND PUNCHED CARD THEREFOR**
 8 Claims, 5 Drawing Figs.

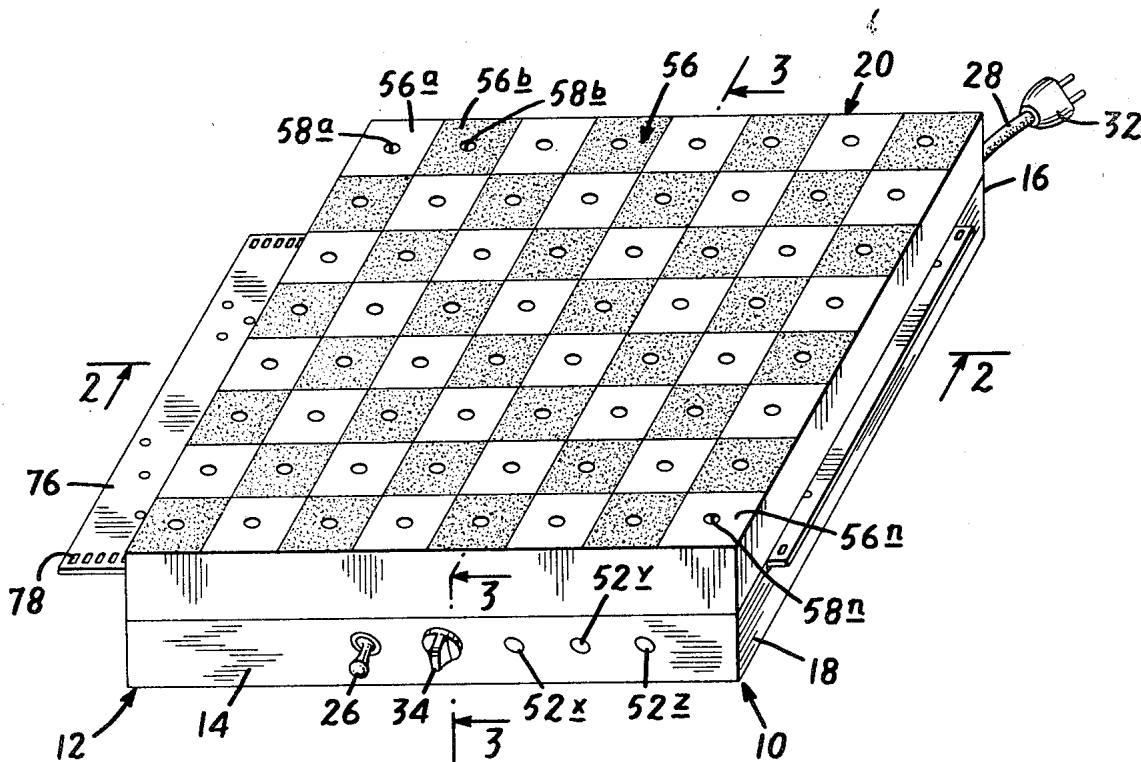
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 273/136

[51] Int. Cl. G09b 19/22,
 A63f 3/02

[50] Field of Search..... 35/8;
 273/136 (A), 149 (P); 340/380

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ABSTRACT: As described herein, a light source mounted in a housing illuminates each column of a prepunched chess card as the card is intermittently driven through the housing. Each column of the card, except for a start of new game column, includes at least two apertures which transmit the light to the light receiving ends of two of a possible 64 light fibers. The light transmitting ends of the fibers extend to the squares of a chess pattern formed in the top plate of the housing and illuminate the squares when their corresponding light receiving ends are illuminated by the light source. The illuminated squares indicate the chess piece to be moved and the square to which the piece is to be moved.



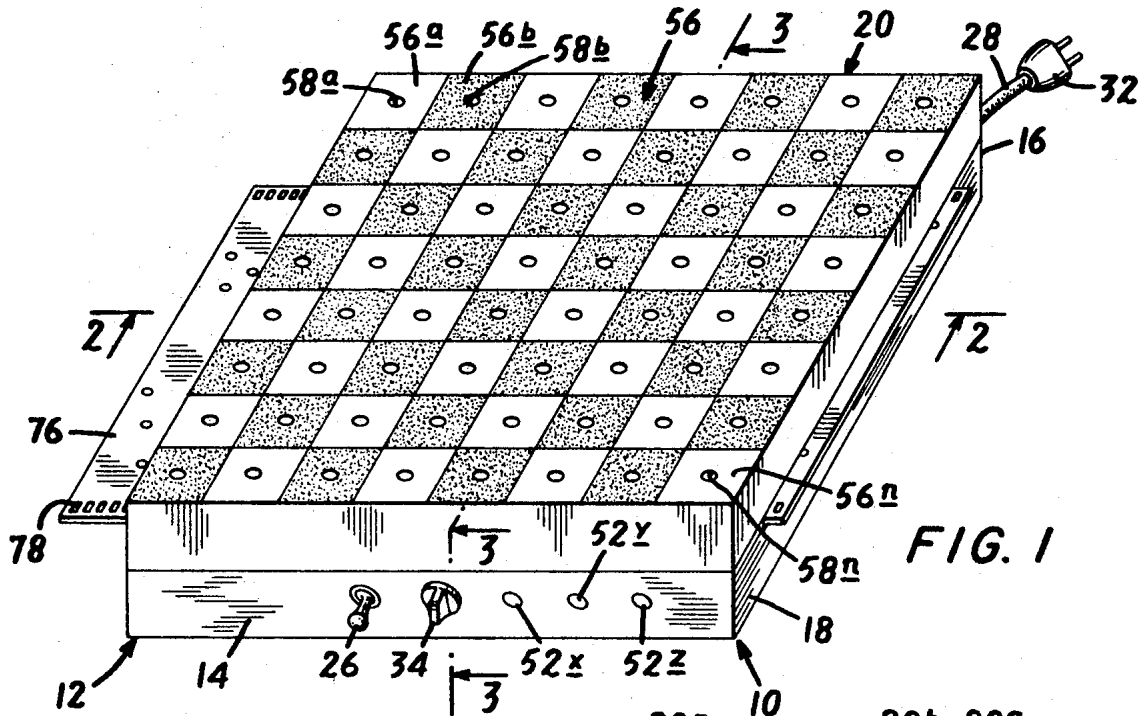


FIG. 1

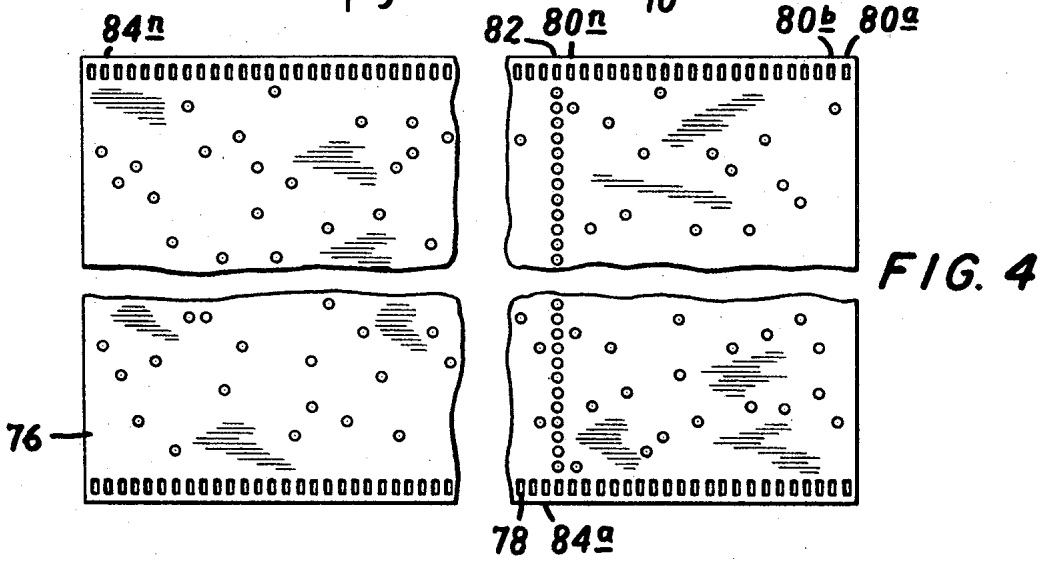


FIG. 4

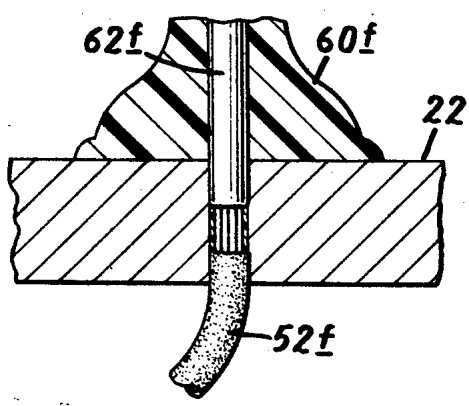


FIG. 5

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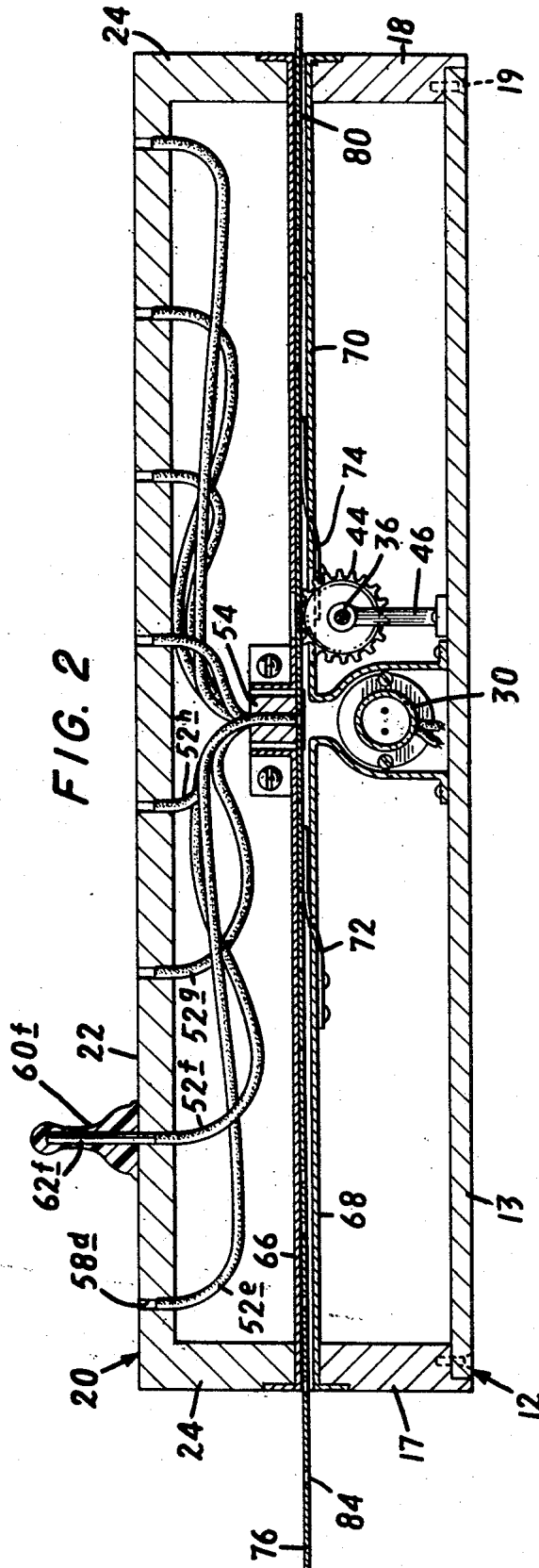


FIG. 2

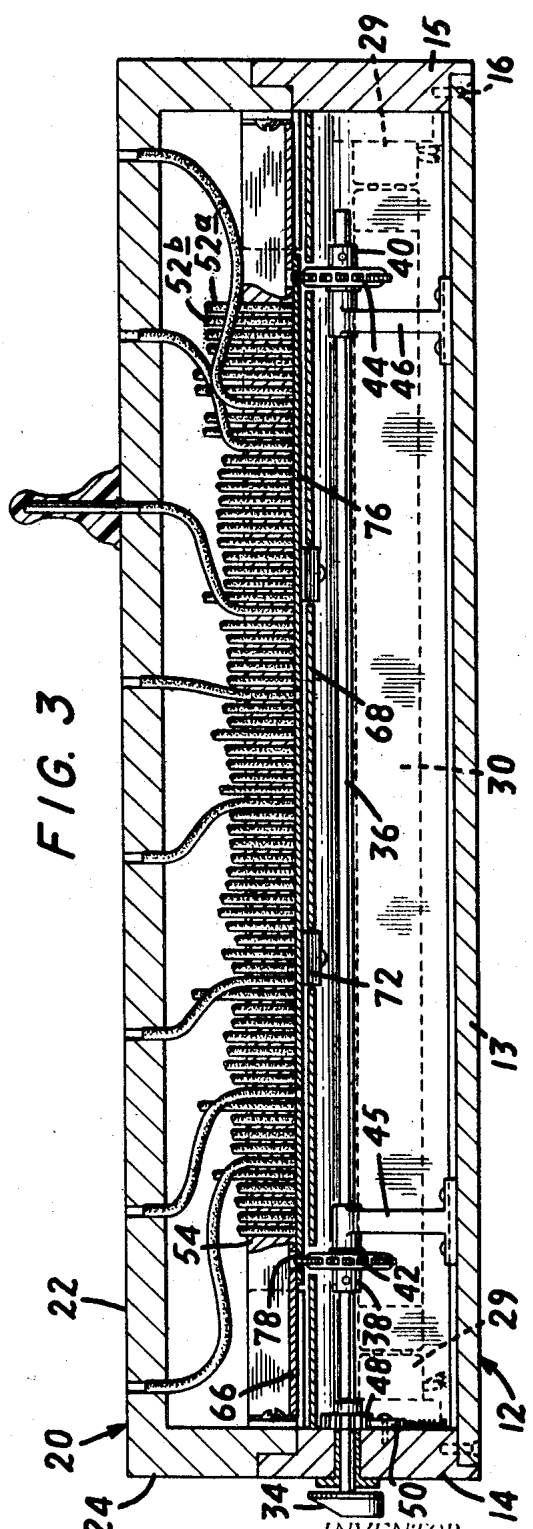


FIG. 3

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AUTO-CHESS APPARATUS AND PUNCHED CARD THEREFOR

BACKGROUND OF THE INVENTION

This invention relates to games which are conventionally played by two or more players using a board and special pieces and, more particularly, to apparatus for such games which enable the games to be played by an individual player.

Games such as chess and checkers are played by two persons who match their skills against each other. The popularity of such games lies in the fact that a player's fascination for the games increases in proportion to his insight into the various strategies of the games. Quite often, a person desirous of acquiring at least a rudimentary knowledge of such games is unable to find a playing companion with the requisite skill and patience necessary to teach him the games. Others, who have become skilled in the intricacies of such games, are unable to find opponents who are similarly skilled and interested in the games. For these reasons, there is a need for devices for such games by which a person can either learn the games or increase his skill in the games without involving a playing companion.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide apparatus for such games which enable the games to be played by an individual player.

This and other objects are accomplished by the apparatus for games of the present invention which comprises a light source adapted to illuminate selected light transmissive portions of a programmed record as relative movement between the record and the light source is effected. The light transmissive portions transmit the light to the light receiving ends of associated light transmitting fibers. The light transmitting ends of the fibers extend to the segments of a game pattern formed in a plate member and illuminate the segments when their corresponding light receiving ends are illuminated by the light source.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

FIG. 1 is a perspective view of an illustrative apparatus for games arranged according to the present invention;

FIG. 2 is an enlarged cross-sectional view of the apparatus taken along line 2-2 of FIG. 1 and looking in the direction of the arrows;

FIG. 3 is an enlarged sectional view of the apparatus taken along line 3-3 of FIG. 1;

FIG. 4 is a fragmentary plan view of an illustrative programmed record for use in the apparatus and arranged according to the present invention; and

FIG. 5 is an enlarged fragmentary sectional view of the top wall of the apparatus and of a typical game piece for use with the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the illustrative apparatus for games arranged according to the present invention, as shown in FIGS. 1, 2 and 3, a housing 10 is provided which includes a support member 12. The support member 12 includes a bottom wall 13 secured to front and back walls 14 and 15, respectively, by a plurality of screws 16 and secured to sidewalls 17 and 18 by a plurality of screws 19. Removably mounted on the support member 12 is a board member 20 which includes a flat upper surface 22 and downwardly depending edges 24 which frictionally engage the walls 14, 15, 17 and 18 of the support member 12.

A spring biased toggle switch 26 is mounted on the front wall 14 of the support member 12 and includes normally open contacts connected in series between an AC power cable 28 and the power receptacles 29 for a high intensity light source 30 which extends centrally of and in parallel with the sidewalls

17 and 18 of the support member. The cable 28 includes a conventional plug 32 adapted for insertion into a conveniently located AC outlet. As best shown in FIGS. 2 and 3, the light source 30, which may be of conventional construction, includes contacts at its opposite ends which are received by the receptacles 29. In turn, the receptacles are bolted to the front and back walls 14 and 15, respectively, of the support member 12.

A rotary switch 34 (FIGS. 1 and 3) is also mounted on the front wall 14 of the support member 12 and is fixed to a rotatable shaft 36 extending lengthwise of the housing. Secured to the shaft by screws and rotatable therewith are a pair of spaced sleeves 38 and 40, respectively, which support a pair of sprockets 42 and 44, respectively. Supporting the rod 36 are a pair of upright flange members 45 and 46 which are secured to the bottom wall 13 of the support member and are situated adjacent the sprockets 42 and 44, respectively. The rod 36 is further received by a ratchet 48 mounted adjacent the front wall 14 of the support member 12. The ratchet 48 is engaged by a spring-biased pawl 50 which prevents the ratchet 48 from rotating freely and, accordingly, prevents the shaft 36 from rotating freely. It is in this manner that the distance travelled by the sprockets 42 and 44 when the rotary switch 34 is actuated is controlled.

Also mounted in the front wall 14 of the support member 12 are the light transmitting ends of three light fibers 52x, 52y, 52z. The light receiving ends of the fibers are retained in a support rod 54 which extends immediately above and in parallel with the light source 30. The light receiving ends of an additional closely spaced 64 light fibers 52a-52n are further mounted in the rod 54, the spacing between adjacent fibers along the rod being dependent upon the spacing of the punched holes in the record for apparatus, as will be explained in detail hereinafter. As will also be explained hereinafter, the illumination of the light transmitting fiber 52x may indicate that a "checkmate" condition has been reached and the illumination of the light transmitting fibers 52y and 52z may indicate to the player using the apparatus that he has scored one, two or three points for making a particularly skilled move. By mounting the light transmitting ends of the fibers 52x, 52y and 52z in the front wall 14, the player is provided with a visual indication of the occurrence of such conditions.

Preferably, the fibers are relatively flexible, durable and have excellent light transmission characteristics. Such light transmitting fibers which may be employed in the instant invention are the plastic fibers marketed under the trademark "Crofon" by the DuPont Company. These plastic fibers consist of a number of 10-mil. diameter plastic fibers bundled randomly in a common jacket. The Crofon light fibers accept light from a cone with an apex angle of about 70° and emit light in a similar cone at the output end. In the Crofon fibers and other similar light transmitting fibers, the amount of light absorbed by the fibers increases as the lengths of the fibers increase.

As shown, the 64 light fibers 52a-52n extend from the support rod 54 to the flat upper surface 22 of the board member 20. The flat upper surface 22 has a conventional eight-by-eight chess pattern 56 printed thereon and in the alternately colored light and dark squares 56a-56n there are formed in the board member cylindrically shaped openings 58a-58n (FIG. 1). The light transmitting ends of the fibers 52a-52n are received in the lower portions of the openings 58a-58n and secured to the board member 20 in any suitable manner, for example, by means of an adhesive. Preferably, because the light absorption in the fibers increases with increasing fiber length, the shortest possible "fiber run" is provided between the rod 54 and the openings 58a-58n. It will be noted that the 64 light fibers 52a-52n mounted in the rod 54 accommodate the squares 56a-56n, respectively.

As shown in FIGS. 2, 3 and 5, the chess pieces 60a-60i for the apparatus, which may, for example, be formed of plastic, include center members 62a-62i which extend through and beneath the main body portions of the pieces and are dimen-

sional such that they fit evenly into the openings 58a—58n, respectively. The center members 62a—62i of the chess pieces are formed of suitable light transmissive material, such as, for example, glass, and transmit the light received from the fibers 52a—52n to illuminate the chess pieces 60a—60i. By constructing the chess pieces 60a—60i with the light transmissive center members, the chess pieces are maintained in stationary positions in the squares 56a—56n and are illuminated when the light fibers 52a—52n, respectively, received by the squares on which the pieces are situated are illuminated.

Secured to the side edges 24 of the board member 20 and bolted to the front and back edges thereof is a plate member 66. Coextensive with opposite halves of the plate member 66 are a pair of plate members 68 and 70 which are secured to the sidewalls 17 and 18, respectively, and the bottom wall 13 of the support member 12. A pair of springs 72 and 74 are bolted to the plate members 68 and 70, respectively, and contact the plate member 66.

As shown, openings between the sidewalls 17 and 18 of the support member 12 and the side edges 24 of the board member 20 are defined by the plates 66 and 68, 70. A programmed record, here shown as a prepunched chess card 76, is adapted to pass through the openings. As shown in FIG. 4, the chess card 76 includes registration apertures 78 extending along opposite edges thereof for engaging the sprockets 42 and 44. The card 76 further includes spaced columns 80a—80n, 82, and 84a—84n. The spaced columns 80a—80n having spaced apertures selectively punched therein correspond to a first chess game, the column 82 having a total of 67 spaced apertures punched therein indicates a start of new game column and the columns 84a—84n having spaced apertures selectively punched therein correspond to a second chess game. Each spaced aperture punched in the card 76 is aligned with the light receiving end of one of the light transmitting fibers 52a—52n and the spacing between adjacent fibers in the rod 54 is the same as the spacing between adjacent apertures punched in the card 76. Specifically, the spacing between the 67 apertures punched in the start of a new game column 82 is the same as the spacing between the 67 light receiving ends of the fibers 52a—52n mounted in the rod 54. The spacing of the columns is such that only one column of apertures can be illuminated by the light source 30 at any given time. The springs 72 and 74, which urge the card 76 against the rod 54, make certain that only one column of apertures is illuminated by the light source 30 at any given time.

Each of the columns 80a—80n includes at least two selectively punched apertures which transmit the light emitted by the light source 30 to the light receiving ends of two of the light fibers 52a—52n. This causes the illumination of one of the chess pieces 60a—60i to indicate the chess piece to be moved and the illumination of one of the squares 56a—56n to indicate the square to which the piece should be moved. The apertures of adjacent columns indicate, respectively, the move the player should make and the move that the player should make for the apparatus, as will be explained in detail herein. One of the columns, for example, column 80n has an additional aperture to effect the illumination of the light fiber 52x to indicate a "checkmate" condition has been reached. Still other columns may include one or two additional apertures to effect the illumination of one or both the light fibers 52y and 52z to indicate that the player should give himself one, two or three points for making a particularly skilled move.

In operation, the prepunched chess card 76 is inserted into the housing 10 via the opening defined by the plate 66 and the plate 68 (FIG. 2) until the registration apertures 78 engage the sprockets 42 and 44. A start of new game column should be aligned with the light source 30 when the sprockets 42 and 44 initially engage the apertures 78. If not already on the board member 20, the center members of the chess pieces 60a—60i are then inserted into the openings 58a—58i of the appropriate squares 56a—56i. Thereafter, the toggle switch 26 is actuated to energize the light source 30 to illuminate the in-

serted chess pieces 60a—60i, all the remaining squares of the chess pattern 56i—56n and the light fibers 52x, 52y and 52z. If complete illumination is not effected, the rotary switch 34 is incrementally rotated to move the punched card 76 through the housing until the start of new game column is located above the light source 30.

Thereupon, the operator moves one of his chess pieces to a desired square and, following his move, incrementally rotates the switch 34 to move the punched card an incremental distance and depresses the toggle switch 26. Two of the 64 light fibers 52a—52n will be illuminated through the first column of the card 76 by the light source 30 to effect the illumination of the chess piece which should have been moved and the illumination of the square to which the piece should have been moved. After making the correct move, the card 30 is again moved one position by the player by rotating the switch 34, the toggle switch 26 is depressed and two fibers illuminated through a second column of the card illuminate the chess piece to be moved and illuminate the square to which the piece should be moved. The game continues in the above manner until a checkmate condition is reached, which condition is visually indicated to the player by the illumination of the light fiber 52x which extends to the front wall 14 of the support member 12.

Although the invention has been described herein with reference to a specific embodiment, many modifications and variations therein will readily occur to those skilled in the art. For example, by changing the coding of the punched card, the device can be used to play checkers. Also, the device can be used as a training device to test the response of a trainee to complex tactical maneuvers. Moreover, provision may be made to drive the punched card automatically and provision may be made to energize the light source concurrently with the movement by the chess card from one column position to the next column position. Accordingly, all such variations and modifications are included within the intended scope of the invention as defined by the following claims.

I claim:

1. Apparatus for games comprising a housing with a board member adapted to receive game pieces, the board member having recorded thereon a predetermined game pattern, a light source mounted in the housing, means in the housing adapted to receive a programmed record having light transmissive portions and including means for effecting relative movement between the light source and the programmed record to cause the illumination of the light transmissive portions, a plurality of light transmitting fibers mounted in the housing, the light receiving ends of the fibers arranged to receive the light transmitted through the light transmissive portions of the programmed record and the light transmitting ends of the fibers arranged to illuminate different portions of the board member when their corresponding light receiving ends are illuminated by the light source, and a programmed record comprising a plurality of spaced columns, each column containing at least two spaced apertures selectively formed therein, the apertures arranged to transmit the light emitted by the light source to the light receiving ends of a selected pair of the plurality of light transmitting fibers to effect the illumination of two portions of the board member to thereby indicate the game piece to be moved and the position of board member to which the game piece is to be moved.

2. Apparatus according to claim 1 wherein the means for effecting relative movement between the light source and the programmed record comprises drive means adapted to engage the programmed record, the drive means including means for incrementally positioning each of the spaced columns of the record in the path of the light emitted by the light source.

3. Apparatus according to claim 2 further comprising support means mounted in the housing immediately above the light source and wherein the light receiving ends of the light transmitting fibers are mounted along the length of the support means, the spacing between adjacent fibers along the support means being equal to the spacing between adjacent apertures formed in the programmed record.

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4. Apparatus according to claim 1 wherein the board member has recorded thereon a plurality of segments arranged in a selected game pattern and wherein the board member has formed therein openings in each of segments for receiving the light transmitting ends of the light transmitting fibers.

5. Apparatus according to claim 2 further comprising a plurality of game pieces, each game piece comprising a main body portion and a light transmissive rigid center member ending through and beneath the main body portion of the game piece and wherein each opening in each of the game pattern segments is dimensioned to functionally receive the portion of the light transmissive center member extending beneath the main body portion of each game piece.

6. Apparatus for games comprising a housing with a board member adapted to receive game pieces, the board member having recorded thereon a predetermined game pattern, a light source mounted in the housing and extending in a straight line between a pair of parallel sidewalls of said housing, the area above said light source defining a selected area of said housing, means in the housing adapted to receive a programmed record having spaced light transmissive portions and including means for effecting relative movement between the light source and the programmed record to cause the illumination of the light transmissive portions, and a plurality of light transmitting fibers mounted in the housing, the light receiving

ends of the fibers being mounted together in a straight line in said selected area of the housing above the light source and arranged to receive the light transmitted through the light transmissive portions of the programmed record, and the light transmitting ends of the fibers arranged to illuminate different portions of the board member when their corresponding light receiving ends are illuminated by the light source.

7. Apparatus according to claim 6 comprising support means mounted in the housing immediately above the light source and wherein the light receiving ends of the light transmitting fibers are supported by the support means in a straight line above the light source, the spacing between the light receiving ends of adjacent fibers along the support means being equal to the spacing between adjacent light transmissive portions of the programmed record.

8. Apparatus according to claim 6 wherein the board member has recorded thereon a plurality of segments arranged in a selected game pattern, wherein the board member has formed therein openings in each of the segments for receiving the light transmitting ends of the light transmitting fibers and wherein the light receiving ends of the light transmitting fibers are selectively mounted within the selected area to maintain the shortest possible distance of travel by the light transmitting fibers between the selected area and the plurality of segments.

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