GAME AND APPARATUS THEREFOR

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4 Claims. (Cl. 273—138)

This invention relates broadly to games of skill and chance and more particularly to apparatus to be used in connection with the playing of various games.

5 The main object of the invention is to produce a machine or system operating in accordance with the laws of probability but wherein the probability of a given result of a cycle of operation is not necessarily the same for every cycle of operation.

A further object of the invention is to produce a machine wherein the probability of a given result at any particular cycle of operation is itself determined by chance.

15 It is a further object of this invention to produce a machine wherein the probability of a given result at any particular cycle of operation is subject to the possibility of changing at each cycle of operation, but the amount by which it may change is more likely to be small than large, so that said probability has very little chance of changing from relatively large to relatively small values or vice versa in less than a considerable number of cycles of operation of the machine.

Other objects of the invention will be apparent from a study of the following description and the drawings.

The essential feature of this invention is the application, to games of skill and chance, of the principle which will be herein referred to as the principle of "variable bias". This principle may be embodied in many forms. Common to all the forms is the employment of a "bias group" (symbolized hereinafter by G) comprising a number b, which may be either constant or variable, of indicators g. The indicators g may be in the form of cards, spinners, chips, dice or in fact any suitable means that may be used as indicators. Each indicator g at any given setting shows one and only one of a definite series of distinctive markings. The marks above referred to may, in general, be symbolized by q, r, s, t, — — — — etc. For example in a special case, to be hereinafter described, the series might be restricted to two: plus q and minus r.

An indicator g of the bias group G may be reset (1) by substituting another similar indicator g' which may have a different marking—as for example by replacing a card marked minus (—) with one drawn from a pack of mixed plus (+) and minus (—) cards; (2) or, if each indicator g is capable of showing any one of the whole series of markings (q, r, s, t, — — — —) it may be reset by any suitable method such as spinning or throwing a die; (3) or, the setting may be in effect changed by replacing the entire given bias group G by a similar group G' which differs only in the setting or shown marking (p or q or r — — — —) of one component indicator g—for example by substituting for the group G of markings p, q, r, s, p, the group G' comprised of p, r, q, p, p. Any such process of resetting will hereinafter be symbolized by Y.

Also common to all the embodiments of this invention is the employment of a cycle (C) of operations, — — — — — — U, V, W, X, Y, — — — — — —. The final result of a given cycle is dependent upon subsidiary results which are derived from suitable ones of the operations or processes U, V, W — — — — etc., at suitable stages of the cycle. For special games the cycle may include, for example, as operations (U, — — — —), the reading of a point score from the throw of dice, the cut of cards, or the spinning of a roulette wheel. The novel features of a cycle for which invention is claimed are, (1) that each cycle (C) includes a reading or registration (W) of one or more markings (p, — — — —) of the "bias group" G; and, (2) that each cycle (C) includes the possibility of the resetting (Y) of the markings (p or q or r or — — — —) of one or more indicators g of the "bias group" G.

The determination as to what resetting Y shall actually be made in any given cycle is left to the special operation or process (X) which forms part of the cycle (C). Said process (X) may involve (1) choice only—for example, the cut of a pack of cards which contains say, twice as many "blank" cards as "reset" cards; or, (2) it may involve any combination of chance, the choice of a player and the state of the game. The nature and mode of said process (X) is, of course, determined by special rules of the particular game being played.

A more specific operation contemplated is the occasional automatic resetting (Xa, Ys) i.e. without the special attention of the player—of the indicators g of the bias group G. An embodiment of the automatic feature of the invention will be described in more detail hereinafter.

The reading or registration W is governed by an operation or process V of the cycle C, in that the operation V selects which one of the indicators g of the bias group G will have its shown marking p read or registered.

The combination of the operations V, W, X, Y, indicated above is necessary for any cycle C of the sort contemplated in this specification together with some operation or process or rule Z, which applies the reading or registration W to the particular game being played. The process
Z may also take into account or be affected by other readings or registrations or operations also forming part of the cycle C.

The invention will be more clearly understood from the following detailed specification of various modifications thereof when read in connection with the appended drawings in which:

Figure 1 illustrates a plan view of a gaming apparatus made in accordance with the invention in which all operations are manually made;

Figure 2 is an end view of the same apparatus taken along the line 2—2 of Figure 1;

Figure 3 is a plan view, partly broken away, of another embodiment of the invention wherein certain operations thereof are entirely automatic;

Figure 4 illustrates a vertical sectional view of the modification of the invention incorporating certain automatic functions shown in Fig. 3.

Let us as

The operator now asks for the disc 1 is shown divided into six equal sectors S each of which has an insect b marked off as shown for a purpose to be hereinafter described.

The groove or runway G has arranged thereon, equally spaced and adjacent the outer periphery of hub 4, thirty-six indentations S similar to indentations I in runway or groove G. It should be noted that of the six indentations 9 adjacent each sector S of hub 4, two of them are adjacent the respective markings 8 of the sectors. Each sector of hub 4 there is placed as shown a small marker or disc 10. Markers 10 may take the form of ordinary discs or coins having as shown markings on both faces, namely, a plus (++) sign on one side and a negative (−−) sign on the other. As is clearly shown in Fig. 2 both the runways G and 8 are built so that they are inclined slightly downward toward the center of the disc 1. The purpose of this construction is to assure that a ball which is set in motion around the runway shall enter one of the indentations 7 or 8 as the case may be when its energy is spent. In this way, a large number of games may be played with the apparatus described above the principles involved will be described in connection with only one game which will herein be referred to as “stock market”. For simplicity, it will be assumed that there are only two players and an operator although any number may play. At the start of the game the operator will pick up the six markers 10, toss them spinning into the air and then place them back, one in each sector S of 4, the markings shown being determined by the toss. It will be assumed that four of the markers 10 landed with the plus (+) side upward and that two thereof landed with the minus (−) side upward—in which positions they are shown in Fig. 1. It will be seen later on that when there are a greater number of plus (+) signs than minus (−) signs showing the market will tend to be “bullish” as distinguished from “bearish”. In order to make the game more interesting by bringing into it more of the element of judgment, the players are kept in ignorance as to the number of plus (+) indicators and minus indicators. That is, while the players are lacking definite knowledge of the relative numbers of plus and minus indicators, they are nevertheless able, to a degree determined by their individual acumen, to infer the most probable approximate complexion of the indicators from a consideration of the results of the preceding few cycles.

The initial price of the “stock” is taken as, say, 50. The operator calls for orders to buy or sell at the next “market price”. Let us assume that neither player wishes to place orders until he has had a chance to form a judgment of the probable bias by seeing how the market is behaving. The operator accordingly puts the machine thru a cycle of operation as follows:

1. Balls B and b are rolled in their respective grooves 5 and 8. Suppose the ball b in groove 5 comes to rest opposite a sector 8 on which a “plus” chip lies, but not adjacent to insect 9, while the ball in groove 5 comes to rest at the number 3. The operator then announces that the price has gone up three points, becoming 53. He then asks if any of the players wish to place buying or selling orders. Let us assume that none does.

The operator then puts the machine thru a second cycle of operation. In this second cycle let us suppose that the ball in groove 5 comes to rest at the figure 2 while that in groove 6 comes to rest adjacent one of the insects 8. The operator then not only announces that the price has changed two points in the direction determined by the sign of the chip in the sector and then rolls the ball in groove 6 comes to rest, but also announces that one of the chips is to be retossed, and re tosses the chip in the sector 8 adjacent to that one in which the ball came to rest. Thus while the players are not informed as to the result of the toss, they know that there is a chance that the bias may have been altered during this second cycle. The operator now asks for buying or selling orders, the new price, let us say, 55. Suppose a player places an order to buy two shares. This order is recorded, and the price at which they are bought is the price which is arrived at by the subsequent (third) cycle of operation of the machine. Likewise sales are made at the price level next following the price prevailing at the time the order was placed. If the ball in groove 5 comes to rest opposite the depression marked 6 then all the six chips are retossed as at the start of a game.

The game preferably consists of a definite number of cycles of operation, for example, 48, of the machine, and the number of shares bought and sold by each player must be made equal by the end of the game. It is also preferable to limit the number of shares which may be bought by each player, for example, to 12 shares bought and 12 sold. A record of all transactions hav-
ing been kept, the winnings or losing for each player may be determined.

There are many different sets of rules that can be used in order to utilize the machine for playing “stock market” or other games; this invention is not concerned with the rules for any particular game, but only with providing a machine or system whose performance in the immediate future can be foretold on the basis of its past performance to an extent largely dependent upon the judgment and acumen of the player.

It is, of course, desirable to perform certain steps in the above mentioned system, as for instance, the “rebias” feature automatically. To this end, the invention provides an automatic rebias mechanism. More specifically, in Figs. 3 and 4 an outer frame or box 100 is provided with a cover 101 which comprises an annular portion forming a glass or other transparent disc 102 and a supporting member 106 in which is rotatably mounted a vertical shaft 107 carrying integral with it a ball race or “bias roulette” 108. Beneath this bias roulette, and supported therefrom, are six shafts 111 (Fig. 1) equidistant from each other and equidistant in length. These shafts are rotatable about their own axes, being supported by bearings 110. Each shaft is provided with a friction wheel 118 at one end thereof and with a “bias wheel” 112 having a milled hub 113 at the other end. The outer periphery of “bias wheel” 112 is marked in alternate sections +, --, --, --,-- etc. or equivalents. Fixedly mounted on projection 108 is a disc 119 having an upwardly turned rim 116 adjacent friction wheel 114.

A “point roulette” wheel 117 is provided adapted to be movably supported on “bias roulette” 108 by means of contacts or supports 118. A ratchet arrangement shown generally at 119 is provided between shaft 107 and support 106. The ratchet mechanism is arranged so that the shaft 107 cannot be spun around by handle 129 will come to rest in exactly one of a predetermined number of different positions as will hereinafter be more clearly described. An individual ratchet mechanism 121 is also provided for each of shafts 111 of “bias wheels” 112. These ratchet mechanisms are arranged so that the respective “bias wheels” will come to rest in exactly any one of a predetermined number of positions should anyone thereof be rotated. Point roulette wheel 117 is provided with depressions or indentations 122 (Fig. 3) in which a ball 125 may come to rest. These depressions correspond to the depressions 1 of Fig. 1 and as in the case of Fig. 1 each of these depressions is given a value identification mark. The value marks are preferably placed adjacent the respective depressions similar in every way to the system employed in Fig. 1.

Bias roulette wheel 108 is for purposes of illustration provided with twelve depressions 124 and six holes 125 in such a manner that it comes directly over a certain one of the six friction wheels 114 and a portion of the outer edge 116 of disc 115. Holes 125 are of such diameter that the central bore of disc 115 (Fig. 4) when resting therein will come in contact with the periphery of corresponding friction wheel 114 and with edge 116 of disc 115.

The rim 103 of cover 101 is provided with an opening or window 121, having a shutter device 120.

From what has thus far been described, it will be seen that the “point roulette” wheel 117 is rotatable around shaft 107 but that it is not keyed to the shaft whereas “bias roulette” 108 is keyed or otherwise fixedly attached to shaft 107. When, therefore, the “bias roulette” 108 is spun around it in turn frictionally drives the “point roulette” 117 through friction due to the rings 118. Thus the player rotates both roulette wheels with a single twist of the milled head 120, but since the connection between the point and bias roulette is not positive the orientation of the former cannot be relied upon by the player for furnishing information as to the hidden orientation of the latter, after the wheels have come to rest. In operation, when the ball 125 of the “bias roulette” settles into a depression 124 nothing happens but should ball 125 settle in one of the holes 125, as shown in Fig. 3, it rests partly on the corresponding friction or drive wheel 114 and partly on the fixed disc edge 118.

The slant of the ball race of wheel 109 is so arranged that the ball 125 will settle into a depression 124 or a hole 125, as the case may be, while the “bias roulette” 108 is still rotating to a certain extent in which case should the ball 125 fall into a hole 125, it will be pushed along the fixed ridge 116 of disc 115 and so forced to rotate the rotation of the ball transmits motion to the drive or friction wheel 114 and through the radial shaft 110 to the corresponding “bias” wheel 112. The setting of that particular bias wheel will thus be changed in a random manner, or, in other words, the apparatus will be rebiasd automatically. It is to be understood that the dimensions, weight and other pertinent characteristics of ball 125 are so chosen that sufficient power will be transmitted it by the friction wheel 114 as to cause the friction wheel to rotate.

With the numbers mentioned above, there is one chance in three that such rebias will occur after a given twist of the bias roulette by the player, and if it does occur, then, since there are six bias wheels, there is one chance in six that an assigned bias wheel is affected.

When the bias roulette is spun again the centrifugal force will pull the ball 125 out of its hole—perhaps after the set of the bias wheel is again altered—and the ball will move to the outer circumference of the ball race, where it will tend to drift backward on the spinning roulette wheel, owing to conservation of momentum. For good shuffling of the ball 125 with respect to the holes and depressions it is desirable that the ratio of the outer circumference to inner circumference of the ball race be made large.

The same applies to the ball 123 on the “point roulette wheel” 117.

In playing the same game with the apparatus depicted generally by Figure 3 as was described in connection with the device shown in Figure 1, namely, “stock market”, it will be assumed as before that there are two players and an operator. At the start of the game the operator will give each of the six wheels 112 a spin by reaching into the six holes provided therefor, in the enclosure of the ball 125 (Fig. 4) when resting therein will come in contact with the periphery of corresponding friction wheel 114 and with edge 116 of disc 115.

The rim 103 of cover 101 is provided with an opening or window 121, having a shutter device 120.

Now as before it will be assumed that four of the six wheels 112 stopped with a (+) plus sign in the uppermost position and two with a (-) minus sign uppermost. Under these circumstances, the
market is slightly "bullish". Suppose now that the initial price of the stock is taken at 50 points but that neither player wishes to place orders until he has had a chance to form a judgment of the probable bias by seeing how the market is acting. The operator accordingly puts the machine through a cycle of operation by spinning the shaft 101 by means of milled head 103 with the result that "bias roulette" 103 and hence "point roulette" 117 are rotated. The resulting centrifugal forces will tend to force the two balls 126 and 123 to the outer portions of their respective ball races. Ball 126 due to the construction of its ball race 108 will roll in one of the depressions of the roulette 108 in less time than that taken by ball 123 to come to rest in one of the depressions of "point roulette" 117. This as described before is desirable in order that about the ball 126 come to rest in a hole 128 it can derive sufficient energy to roll over the wheel 115 with respect to disc 115 to rotate wheel 116 and hence marker wheel 112. When all the parts of the machine come to rest the operator will first note the value of the depression in which ball 123 has come to rest which will be assumed to be 3 points. The operator then lifts the shutter 125 and notes that mark appearing on the wheel 112 which wheel due to ratchet mechanism 110 has come to rest exactly beneath the shutter and, let us say, notes that this reads (+) plus. The operator then announces that the price of the stock has gone up three points thereby becoming 53. During this cycle it will be assumed that ball 123 came to rest in one of the depressions 124 and hence none of the six wheels 126 were altered.

At the end of the cycle the operator asks if any of the players wishes to place buying or selling orders. Let us assume that none does. The operator then puts the machine through a second cycle in which let us suppose that ball 123 comes to rest in one of the holes 125. In this case as described above, the friction wheel directly beneath the hole will rotate thereby rotating corresponding wheel 115 with the result that one of the six bias markings stands a chance of being changed, say, from (+) plus to (−) minus or vice versa, thereby slightly changing the aspect of the so-called market. The six ratchets 121 whose primary purpose is to stop their respective wheels 112 in such a position that one of the markings thereon will be squarely or exactly at the uppermost position may also be constructed to make some sort of a distinctive sound when any of the shafts 111 are rotating so that the players may be notified of the fact that one of the wheels 112 is being rotated and thereby govern them the selection of roulette 108 with respect to future operations.

It will be seen, in such a case, that while the players are not informed as to the result of the automatic "rebus" operation they know that there is a chance that the bias may have been altered during the second cycle. The operator now asks for buying or selling orders. Suppose a player places an order to buy two shares. This order is recorded and the price at which the shares are bought is the price which is arrived at by the subsequent cycle of operation of the machine. Likewise, sales of stocks are made at the price level next following the price prevailing at the time the order is placed.

The ball 123 should not yet have come to rest in the depression marked x at any time the operator will reset all six of the wheels 112 by means of spinning their respective milled heads 113. In such a case that particular cycle may either not be considered in the play or it may be considered that the price of the stock remained the same as the previous price. In such a case, buying or selling orders are consummated at this last price.

A specific example of a card system adapted to playing the "stock market" will be described now in connection with Fig. 5. Group A includes one or more packs of 144 cards each bearing point markings as described above in connection with the point roulette. For example, the cards of group A might be distributed as follows:

- 72 cards marked "one"
- 36 cards marked "two"
- 18 cards marked "three"
- 7 cards marked "four"
- 6 cards marked "five"
- 2 cards marked "zero"

It is to be understood that any other combination of numbers may be chosen as desired.

Group B contains a large number of cards marked "Up" and an equal number of cards marked "Down". About a hundred of each is recommended.

Group C may contain about 200 blank cards, about 100 cards marked 1 and about five cards marked 6. It has been found in actual playing that in that latter group it is not necessary to include cards marked with any numbers intermediate 1 and 6. The three groups are preferably of different sized cards to avoid mixing. The game is started by the following preliminaries: Each group is shuffled and placed in its respective stack face down. Six cards are drawn from group B without looking at them, and placed at one side. These six cards form what will be referred to as a bias group B'. The operator, let us say, announces that the initial price of the stock is 100, and the players give orders to buy or sell if they wish. The next price of the stock is then determined during the first cycle of operation, which is as follows: A card is picked up from group A and examined and it is announced that the price has changed by the number of points indicated by the card. The card is then thrown into a receptacle and will not be used again. Next a card is drawn from group B' and, according to its marking, announcement is made as to the direction of the price change. This card, however, is replaced in B' and group B' is reshuffled. Next a card is drawn from C, examined and thrown into the receptacle. If this card was a blank nothing more is done and the cycle is complete. If, however, this card bore a number, then that number of cards is drawn from pack B' and thrown into the receptacle and the same number of cards is drawn from group B and added to B' to bring the number of cards in B' up to six again. This completes the cycle.

The second cycle is begun by taking orders from the players at the new price, then operating with the cards exactly as in the first cycle. The game is finished when say 50 cycles have been completed. It is preferable to make the number of cycles considerably less than the number of cards in group A so that there is no very large probability of turning up any particular card more than once in the first cycle. The game is finished when say 50 cycles have been completed. It is preferable to make the number of cycles considerably less than the number of cards in group A so that there is no very large probability of turning up any particular card more than once in the first cycle. The game is finished when say 50 cycles have been completed. It is preferable to make the number of cycles considerably less than the number of cards in group A so that there is no very large probability of turning up any particular card more than once in the first cycle.
same in the various embodiments of the invention.

<table>
<thead>
<tr>
<th>Function or device</th>
<th>Embodiment 1</th>
<th>Embodiment 2</th>
<th>Embodiment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bias group, (number of indicaters)</td>
<td>6 chips (reference no. 10, Fig. 1)</td>
<td>6 cards of group B (Fig. 6)</td>
<td>6 cards of group B (Fig. 6)</td>
</tr>
<tr>
<td>Markings, r =</td>
<td>+, = +</td>
<td>&quot;Up&quot;, &quot;Down&quot;,</td>
<td></td>
</tr>
<tr>
<td>&quot;Reel&quot;...</td>
<td>Spinning a wheel automatically by ball 125, Fig. 5.</td>
<td>Replacing a card in group B by one from pack B.</td>
<td></td>
</tr>
<tr>
<td>Determination X</td>
<td>Ball (6) stops next to sector (Fig. 1).</td>
<td>Ball 125 goes into hole 125 (Fig. 5).</td>
<td>A particular card is drawn from group B.</td>
</tr>
<tr>
<td>Selection V</td>
<td>Ball (6) stops by particular sector (Fig. 1).</td>
<td>A particular &quot;bias&quot; wheel stops under window 127 (Fig. 8).</td>
<td></td>
</tr>
<tr>
<td>Registration W</td>
<td>Note result of selection V.</td>
<td>Note result of selection V.</td>
<td>Note result of selection V.</td>
</tr>
<tr>
<td>Rule Z</td>
<td>Stock moves a number of points indicated by the result of V in a sense indicated by W.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading point-U</td>
<td>Ball (B) Fig. 1 goes into particular indentation in groove k.</td>
<td>Ball 125 goes into particular depression.</td>
<td>A particular card is cut from pack A.</td>
</tr>
</tbody>
</table>

It is to be understood that the physical embodiment of the invention may vary in many details without departing from the spirit of the invention and that many other types of games than the one herein described may be played.

We claim:

1. As an article of manufacture, the combination of a housing including a bearing, a rotatable shaft supported by said bearing, a disk device keyed to said shaft and adapted to rotate with and about said shaft as an axis, said disk being shaped so as to form a ball race having a plurality of means for receiving a ball, a plurality of rotatable shafts spaced radially with respect to said first named shaft, said shafts each having on one end thereof driving means adapted when a ball is within certain ones of said ball receiving means to come in frictional contact with the ball and at the other ends thereof a designation indicator device adapted to rotate with its respective radial shaft for indicating one of a plurality of designations, means fixed with respect to said housing arranged with respect to said disk in such a way that a ball resting within one of said ball receiving means will be rotated thereby with the result that when the ball is within a ball receiving means associated with said driving means, said driving means will be rotated thereby, a second rotatable disk device shaped so as to form a ball race having a plurality of means having various designations for receiving a ball and means including said first named disk for rotating said second disk.

2. In a device of the character described, a stationary member, a revolving member positioned within the stationary member, an operating device for the revolving member, a plurality of independent revolving members radially mounted with respect to said first named revolving member, a driving means for selectively rotating one of said radial members in accordance with movements of said first rotating member, a movable member frictionally and co-axially mounted on the first rotating member and game pieces associated with the frictionally mounted member and the axially mounted member.

3. A game device for determining at each cycle of play both the magnitude and direction of the change of score produced during the cycle, comprising in combination, means for selecting by chance one of a number of indicator elements each corresponding to a certain magnitude of score change, a plurality of groups of director elements for registering an indication of direction of change, means for normally concealing the director elements, means for selecting by chance one of the groups of director elements, and additional means for determining by chance which director element of this chosen group registers the directional indication.

4. A cyclic game device for determining at each cycle of play both the magnitude and direction of the change of score produced during the cycle, comprising in combination, a plurality of indicator elements arranged so that each thereof corresponds to a certain predetermined magnitude of score change, operable means for selecting by chance one of the indicator elements, a plurality of groups of director elements each thereof being provided with a plurality of markings thereon to indicate the direction of change of the score change, means for normally concealing the groups of director elements, operable means for selecting by chance one of said director elements and means for determining by chance upon operation of the device which director element of the chosen group is rendered visible to thereby register the directional indication.

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