Sept. 20, 1971 L. E. LARSEN ET AL 3,606,337

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

Filed March 24, 1969 8 Sheets-Sheet 1

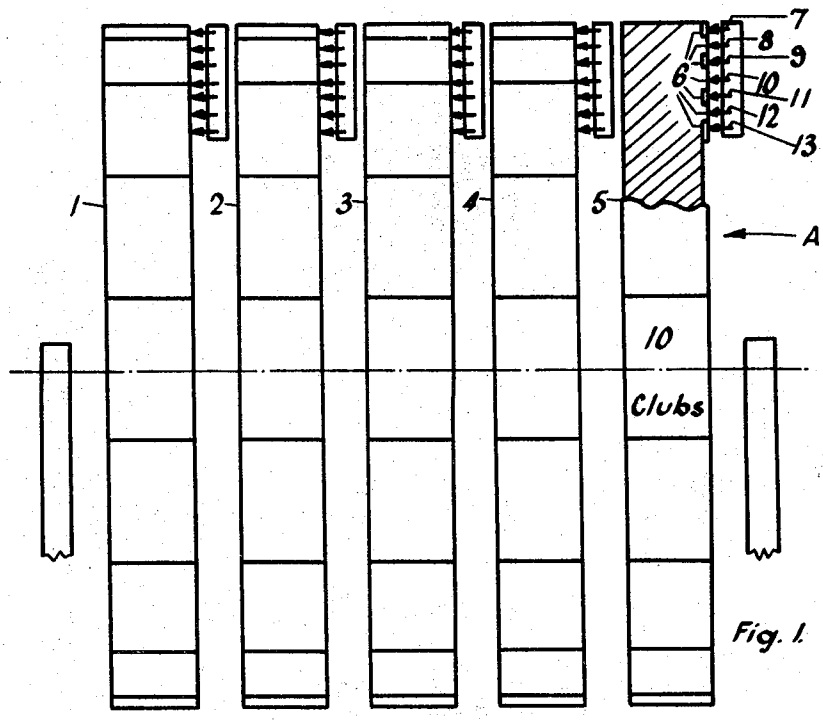

Fig. 1.

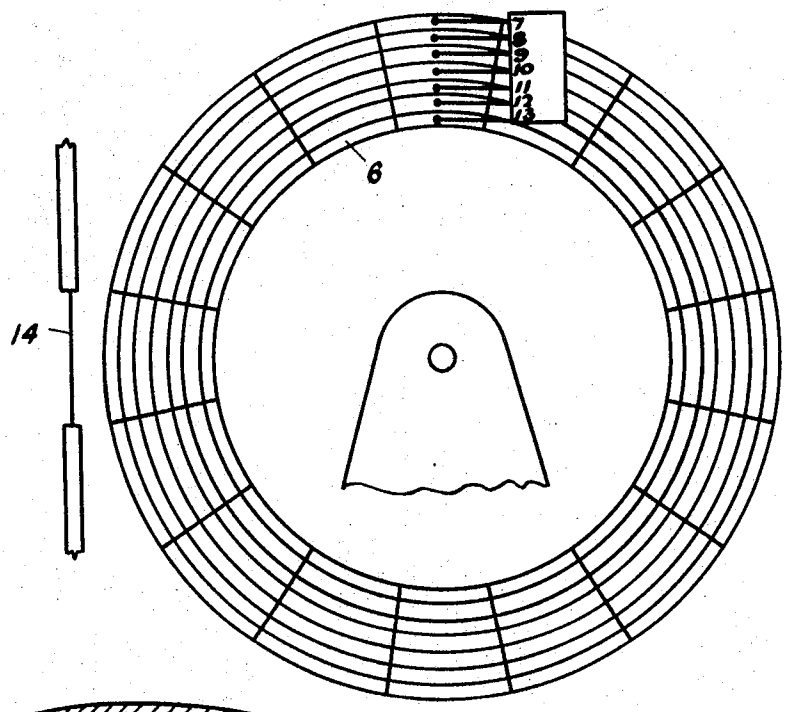

Fig. 2

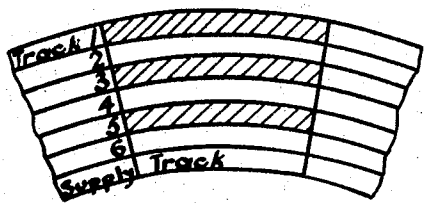

Fig. 3.

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

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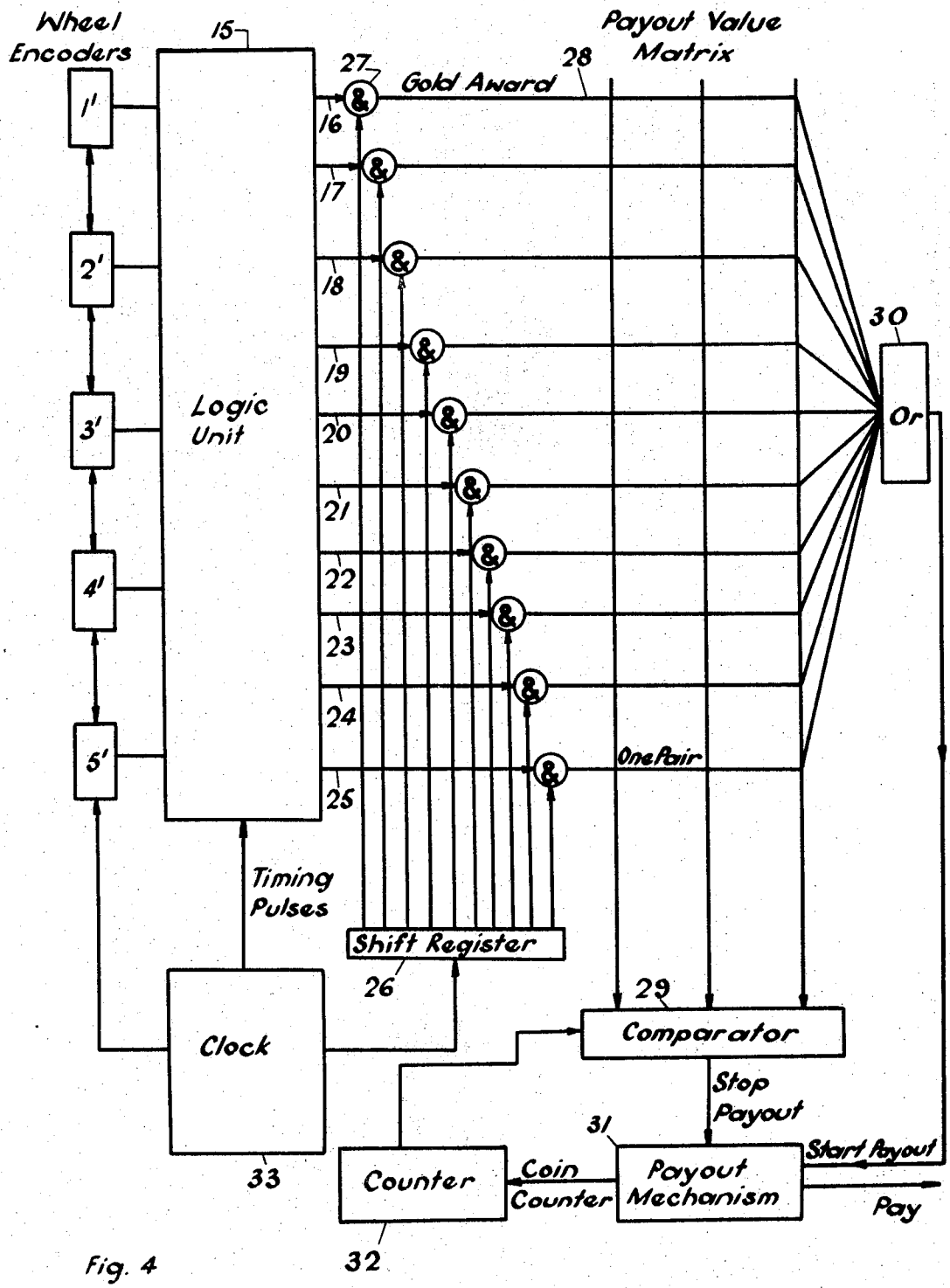

Fig. 4

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

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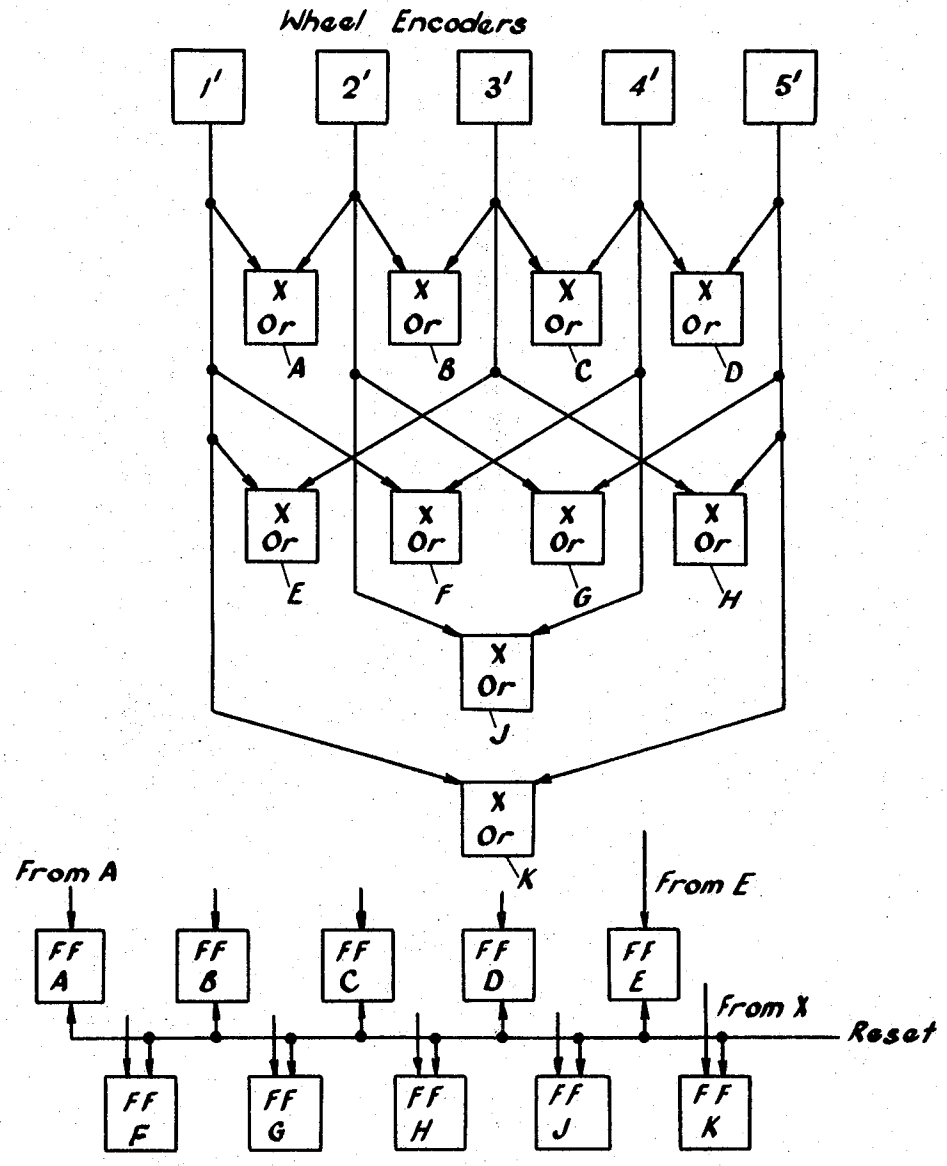
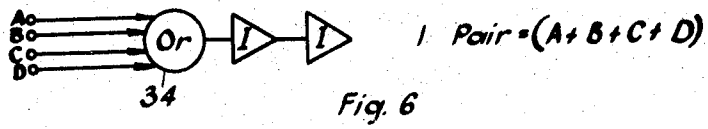


Fig. 5



1 Pair = (A + B + C + D)

Fig. 6

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

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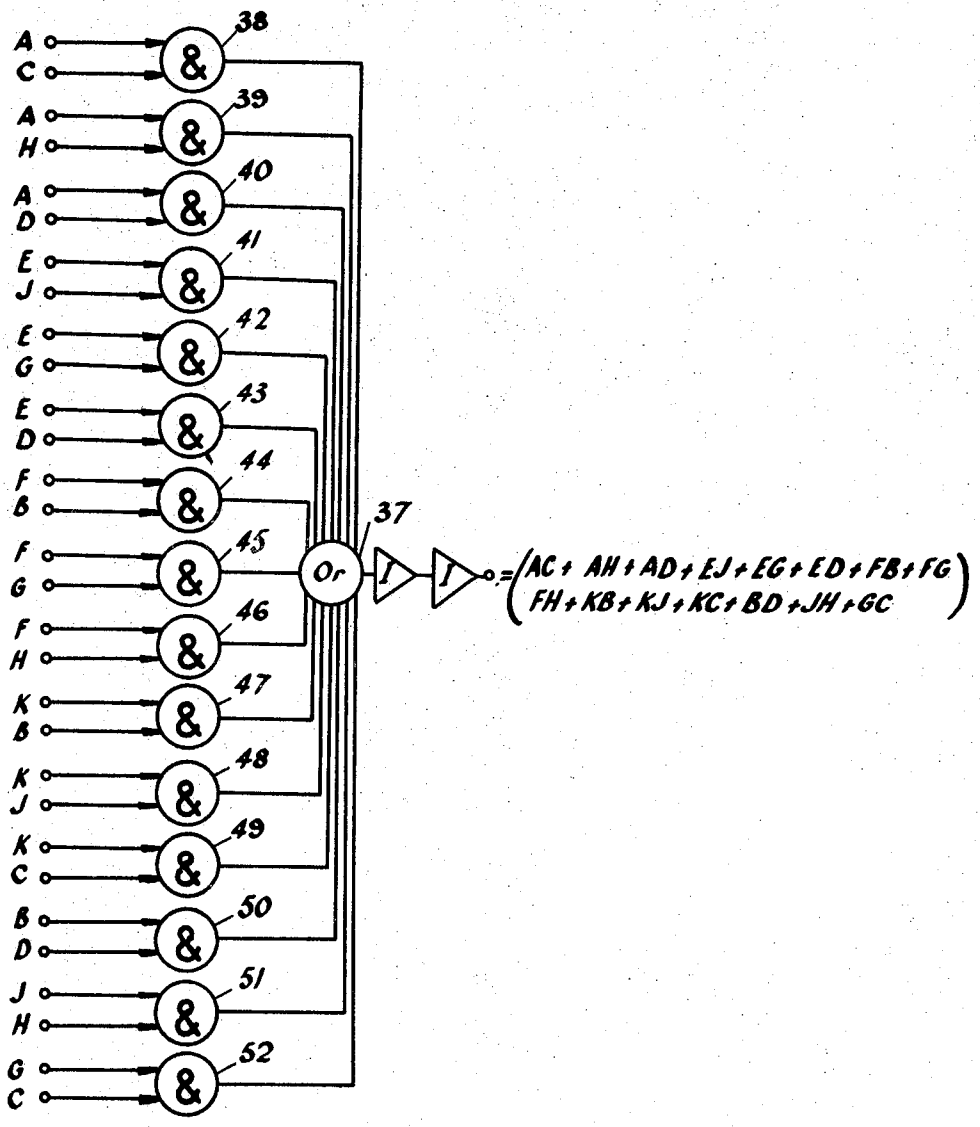

Fig. 7

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

Filed March 24, 1969 8 Sheets-Sheet 5

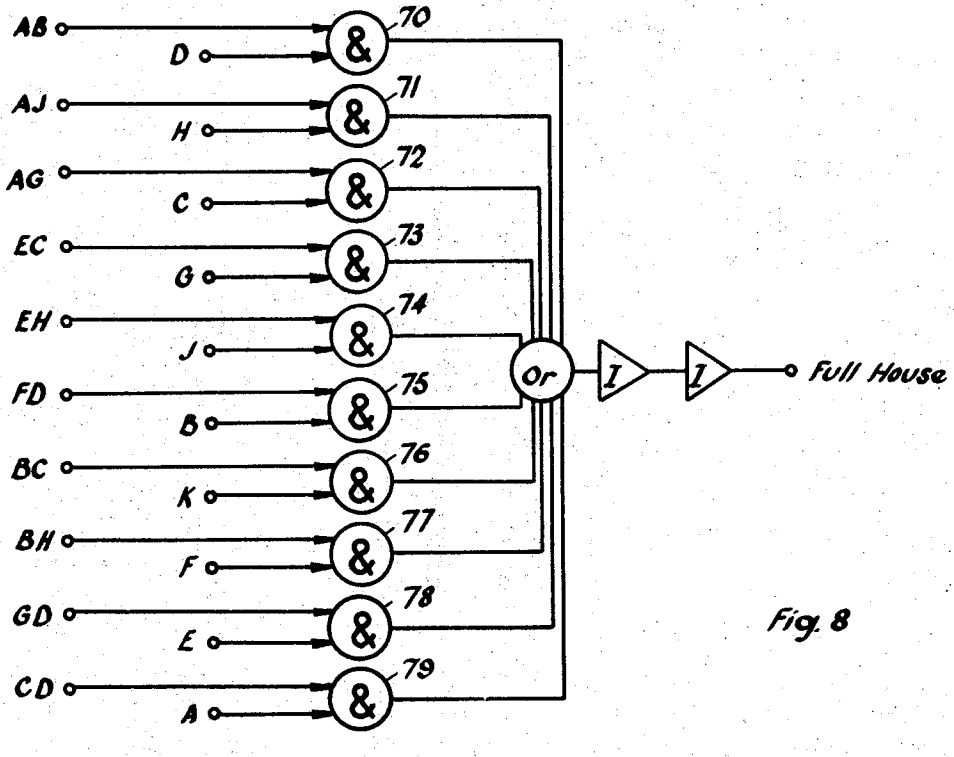

Fig. 8

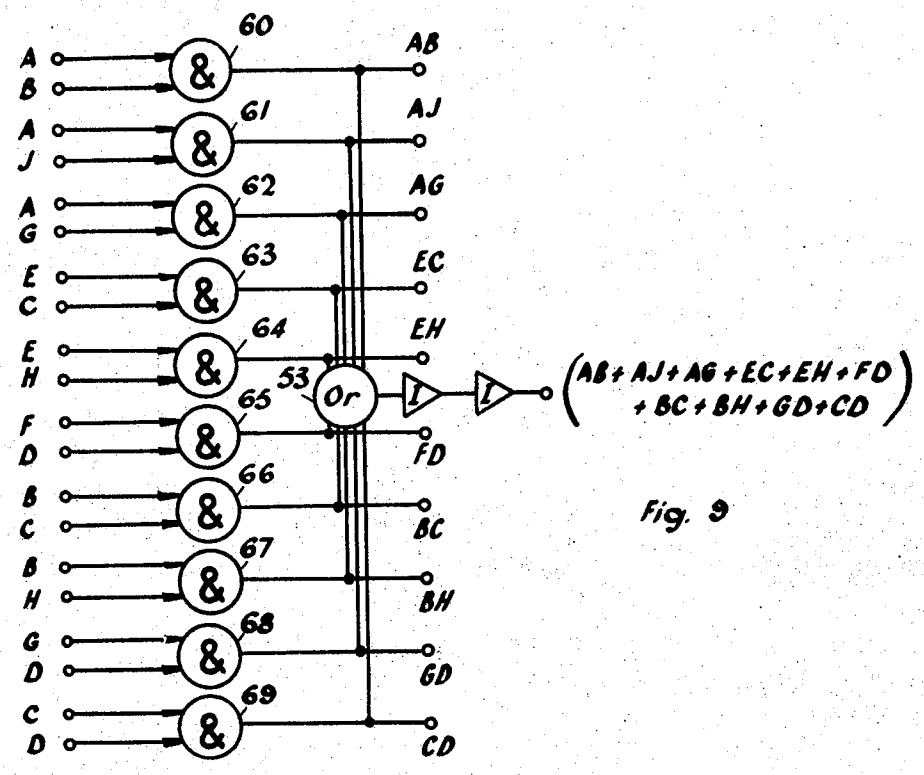

Fig. 9

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

Filed March 24, 1969 8 Sheets-Sheet 6

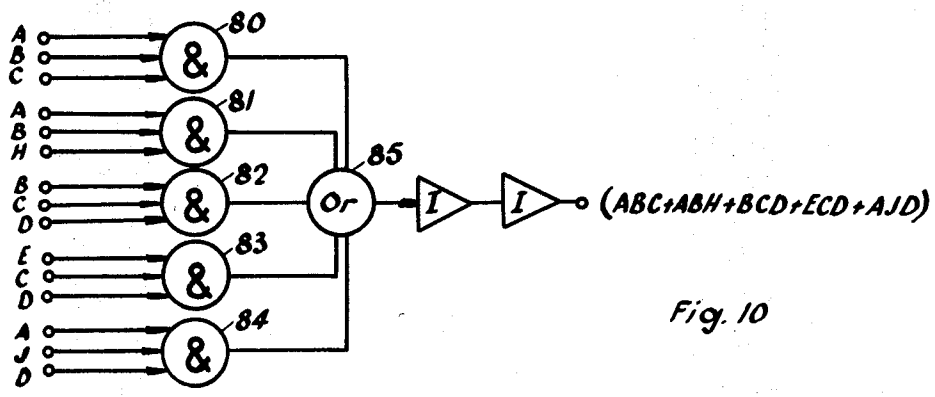

Fig. 10

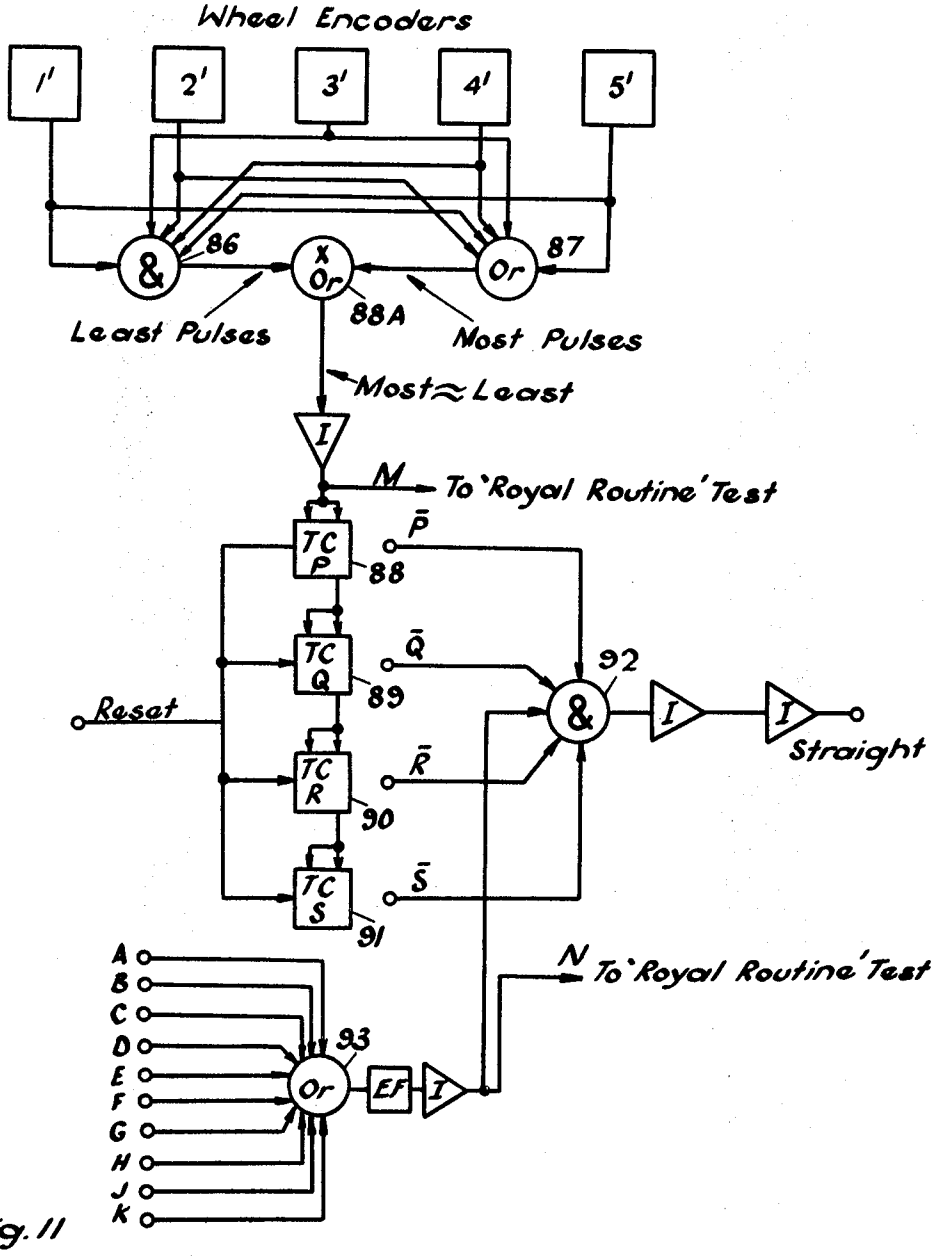

Fig. 11

Suits Are As Follows

	X	Y
Hearts	0	0
Diamonds	1	0
Clubs	0	1
Spades	1	1

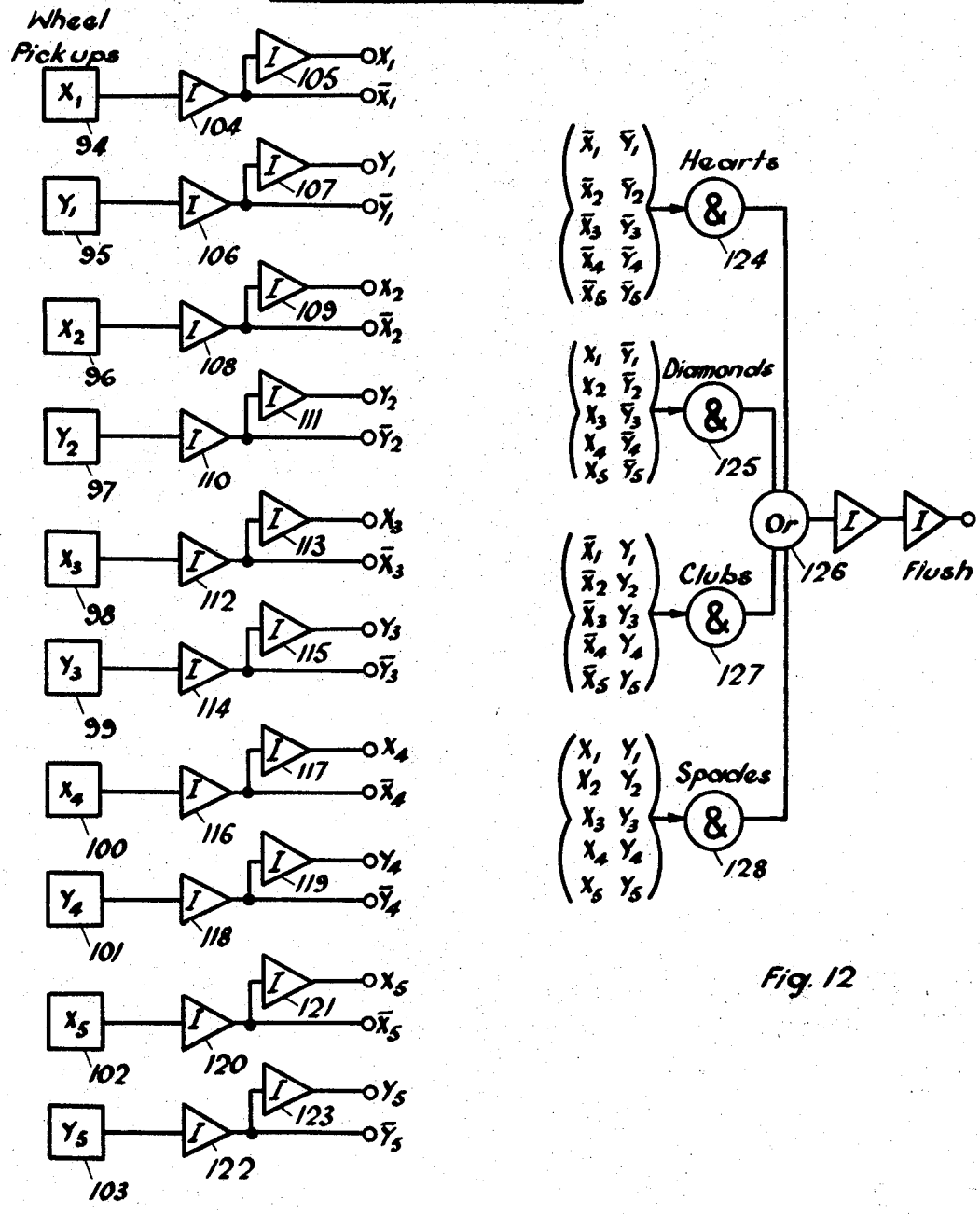

Fig. 12

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

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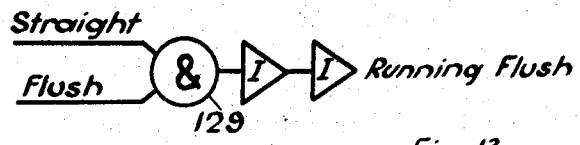

Fig. 13

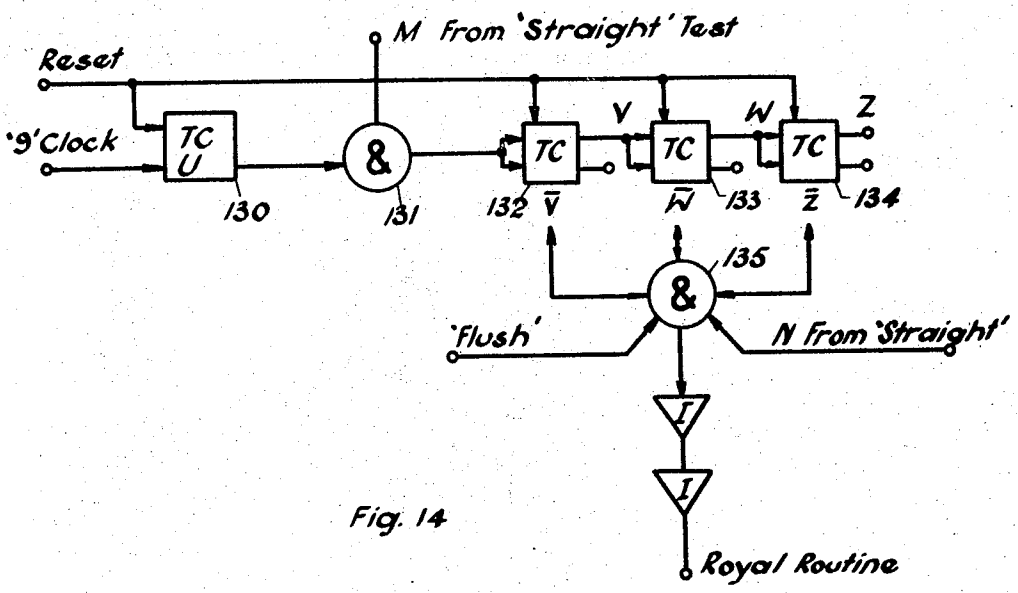

Fig. 14

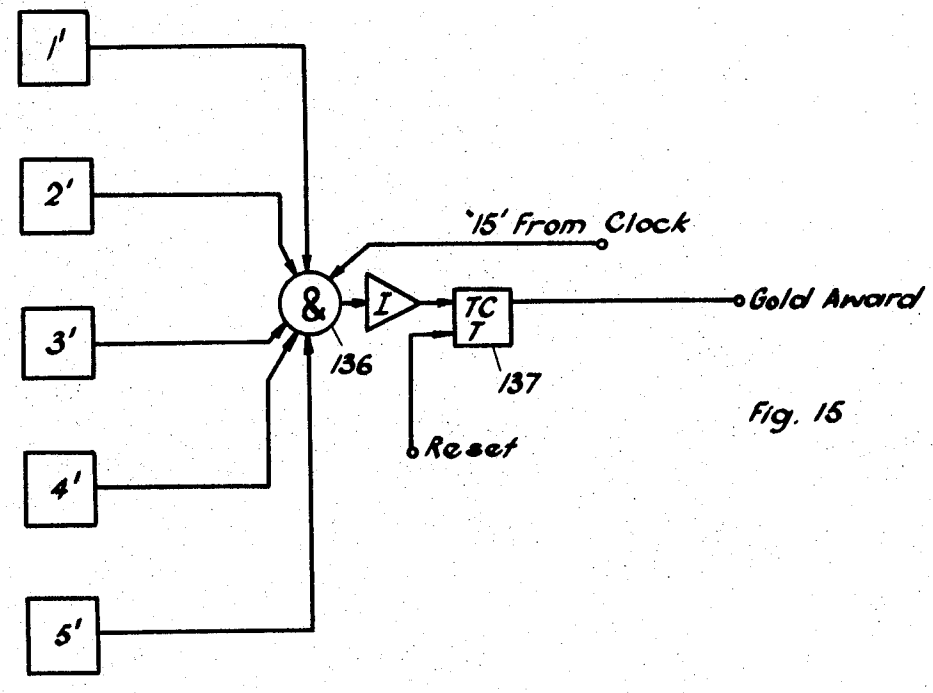

Fig. 15

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3,606,337

POKER MACHINE HAVING BINARY CODED ROTATABLE DRUMS

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Int. Cl. A63f 1/18
U.S. Cl. 273—143R 12 Claims

ABSTRACT OF THE DISCLOSURE

A poker machine of the type having five reels on which indicia of cards are displayed and winning combinations determined according to particular combinations displayed in a window characterized by coding each of the reels on a side surface thereof with electrical information in digital form corresponding to the indicia on the adjacent periphery. The digital information of the stopped reels is fed to a logic unit to determine the presence of winning combinations and cause the appropriate pay off.

This invention relates to poker machines. Mechanical limitations on present day poker machines prevent the use of more than four reels or wheels. The present invention enables poker machines having five reels to be manufactured, thus enabling pay-outs to be based on ordinary winning combinations in poker. However the invention can also be applied to poker machines having only three or four reels.

According to this invention a poker machine of the type having reels on which indicia are displayed, winning combinations being characterised by particular combinations of indicia displayed in a window, is characterised in that electrical information in digital form corresponding to the indicia displayed is taken from the stopped reels and fed into a logic unit, an output being obtained from the logic unit if a paying combination is shown by the stopped reels, said output causing a pay-out of the prescribed amount to be made.

Reference will now be made to the accompanying drawings in which

FIG. 1 is a diagrammatic view from the front of a set of five poker-machine reels,

FIG. 2 is a diagrammatic view of one reel looking in the direction of the arrow A in FIG. 1,

FIG. 3 is a fragmentary view of portion of a reel at the sensing position, showing a pattern corresponding to the ten of clubs in one possible coding system,

FIG. 4 is a block diagram of the logic and payout mechanism,

FIGS. 5 to 15 are logic diagrams of equipment in the logic unit of FIG. 4,

FIG. 5 shows the logic diagram of the equipment used to determine inequality or equality existing in the ten possible unique pairs,

FIG. 6 shows the logic diagram of the equipment which makes the pairs test to ascertain whether a pair of cards exists on any two adjacent wheels,

FIG. 7 shows the logic diagram of the equipment used for the test for two pairs of cards,

FIG. 8 shows the logic diagram of the equipment used for the test for "Full House,"

FIG. 9 shows the logic diagram of the equipment used for the test "Three of a Kind,"

FIG. 10 shows the logic diagram of the equipment used for the test for "Four of a Kind."

FIG. 11 shows the logic diagram of the equipment used for the test for a "Straight,"

FIG. 12 shows the logic diagram of the equipment used for the test for a "Flush,"

FIG. 13 shows the logic diagram of the equipment used for the test for a "Straight or Running Flush,"

FIG. 14 shows the logic diagram of the equipment used for the test for a "Royal Routine,"

FIG. 15 shows the logic diagram of the equipment used for the test for "Gold Award."

Referring now to FIGS. 1 to 3, a poker machine is represented diagrammatically by the five reels **1**, **2**, **3**, **4**, **5** each of which bears on its circumference representations of the cards in a pack of cards, such as is indicated on wheel **5** by marking "10 clubs."

The mechanism for causing the reels to spin when a coin has been inserted and for stopping the spinning reels to give a result have not been shown since they may be of any conventional type. Each reel carries on one flat face a copper-clad laminate ring **6** which is etched according to a predetermined binary code. The information provided by the etched patterns is extracted by the spring wire or strip contacts **7**, **8**, **9**, **10**, **11**, **12**, **13** which bear on what are in effect seven concentric tracks. Contacts **7** to **12** are for sensing, while contact **13** applies a supply voltage to the innermost ring, which ring is continuous. In the machine shown the sensing position is at the top of the reel, while the viewing position is at right angles thereto, as shown by the viewing window **14** in FIG. 2.

To enable the computer to examine the group of five cards showing in the viewing window of the machine, the Face Value and Suit of each card is coded, a Binary Coded number being allotted for each card in a normal pack of cards, and sensing means translates the Binary Coded number into an electrical signal suitable for computation.

To facilitate computation, the Binary Coded Number is divided into a four bit number for the Face value giving 16 possible numbers, and a two bit number for the Suit giving 4 possible Suits. A typical arrangement is as follows:

Ace	1000
2	0100
3	1100
4	0010
5	1010
6	0110
7	1110
8	0001
9	1001
10	0101
Jack	1101
Queen	0011
King	1011
Hearts	00
Clubs	01
Spades	11
Diamonds	10

so that, for example

10 of Clubs=010101 as is shown in the example of FIG. 3.

When a spring contact makes contact with a conducting part of a track, it is energised from the supply con-

tact and supply track: this voltage is interpreted as a binary "1." If however, the contact touches an area where the conducting surface has been removed by etching, then no voltage will appear on it and the computer will interpret it as a binary "0." In FIG. 3 the shaded areas represent etched or non-conducting areas, so that, reading from the top, the contacts would sense the binary number 010101, which is the 10 of clubs.

Referring now to FIG. 4, positional informatilon from the stopped reels **1** to **5** is processed in the reel encoder **1'** to **5'**, the outputs of which are fed to a logic unit **15**. In the logic unit a decision is made according to which cards are displayed in the viewing window, and, if a paying combination exists, an output from the logic unit appears on one of ten lines **16** to **25** which are one of ten paying combinations. These wires are examined sequentially starting with the pay having the most significance, and proceeding to the lowest significance. If any of these examinations show that a particular pay exists, a pay-up mechanism is initiated at the same time as a number is generated corresponding to the number of coins allotted to that particular pay. When the number of coins has been ejected by the machine corresponding to that pay value a comparison mechanism causes the pay mechanism to stop and the machine is then ready for another operation.

To achieve the examination of the pay-out lines **16** to **25** a shift register **26** containing ten stages is preset so that the first stage is energised. The output from the first stage is combined with the pay line used for the most significant pay in a logical AND function **27**. If both inputs to the AND function are at logical 1 the corresponding line **28** in the pay-out matrix is energised thus energising the appropriate number into the comparison mechanism **29**. Simultaneously the logical OR **30** function examines all ten outputs from the logic unit to determine whether a pay actually exists. When a pay exists the pay-out mechanism **31** is inititaed which ejects coins from the machine and simultaneously causes a counter **32** to record the number of coins. When the electrical content of the counter equals the number set by the pay-out matrix the comparison mechanism stops the pay-out mechanism.

The clock unit **33** of FIG. 4 contains timing information to control the sequence of events in the computer. This can be roughly divided into two equal periods—the first period being allotted to encode the reel position into information suitable for processing in the logic unit. The second period is allotted to controlling the stepping on of the shift register **26** to examine sequentially the pay-out wires **16** to **25** from the logic unit **15**.

Referring to FIG. 5 the positional information from the poker machine reel after processing electronically by the 5-reel encoders numbered **1'** to **5'** is examined by the ten exclusive OR functions A to K to determine equality or inequality existing in the ten possible unique pairs which may be selected from the encode information from the reel. In this comparison only the electrical signals corresponding to the four bit numbers for the face value of the cards is used since the information regarding the suit is not relevant. At the beginning of the sequence of events during one play of the machine the ten bistable elements labelled FF suffix A to FF suffix K are reset to their logical 1 state. The outputs from the exclusive OR functions labelled A through to K are connected to the corresponding bistable elements such that if an inequality exists between any pair selected from the encode information the bistable element is set to a logical 0.

As previously described each reel encoder is presented with a 4 binary word representing the number displayed on the associated reel and derived from the positional sensing mechanism on the reel. This 4 bit binary word is processed in the reel encoder **1'** to **5'** so that a train of pulses containing a number of pulses equal to the original decimal number is presented to the logic unit **15**. Thus we have the 5-reel encoders presenting the logic unit with a train of pulses from each representative of the card number information. These trains of pulses are then examined by the exclusive OR functions for equality as previously described.

For convenience the arrangement to be described, in the case of one pair, pays only when pairs exist on adjacent reels, and the equipment required for this is shown in FIG. 6. Referring first to FIG. 5 if the outputs from reel **1** and reel **2** have the same value the bistable element labelled FF_A will remain in the one state. Similarly if the outputs from reels **2** and **3**, **3** and **4**, and **4** and **5** are equal bistable elements FF_B, FF_C and FF_D will remain in the one state. Accordingly the outputs A, B, C, D from bistable elements FF_A, FF_B, FF_C, FF_D respectively are applied to the OR function **34** in FIG. 6. If a pair of cards exists on any two adjacent reels the OR function **34** will present to the output line the information that a pair does in fact exist. The amplifiers marked **1** in this and other figures are inverting amplifiers.

FIG. 7 shows the test for 2 pairs of cards. Referring again to FIG. 5, if for example the outputs from reel encoders **1'** and **2'** are equal and the outputs from the reel encoders **3'** and **4'** are also equal, the bistable elements FF_A and FF_C will remain at the logical 1 state. Referring to the uppermost section of FIG. 7 it can be seen that the outputs A and C from FF_A and FF_C are applied to a logical AND function **38** such that if they are both at the one state they will combine to produce a logical 1 state at the input to the OR function **37** showing that two pairs exist on the output line, the two pairs being reels **1** and **2** being equal and **3** and **4** being equal. All possible combinations of two pairs are similarly determined in the logic diagram of FIG. 4. Reading from the top one of the AND functions in FIG. 7, an output from the respective AND function will represent pairs on the reels as set out in the following table.

AND function:	Reels		Reels
38	**1** and **2**	and	**3** and **4**
39	**1** and **2**	and	**3** and **5**
40	**1** and **2**	and	**4** and **5**
41	**1** and **3**	and	**2** and **4**
42	**1** and **3**	and	**2** and **5**
43	**1** and **3**	and	**4** and **5**
44	**1** and **4**	and	**2** and **3**
45	**1** and **4**	and	**2** and **5**
46	**1** and **4**	and	**3** and **5**
47	**1** and **5**	and	**2** and **3**
48	**1** and **5**	and	**2** and **4**
49	**1** and **5**	and	**3** and **4**
50	**2** and **3**	and	**4** and **5**
51	**2** and **4**	and	**3** and **5**
52	**2** and **5**	and	**3** and **4**

It will be noted that if one input A to K to an AND function relates to a particular pair of reels, then the other input must not relate to either of those reels. Thus since the input A relates to reels **1** and **2** it is combined only with inputs C, H and D since the other inputs B, E, F, G, J and K all are dependent upon one or other of reels **1** and **2**.

The equipment for testing for "three-of-a-kind" is shown in FIG. 9. If the outputs from reel encoders **1'**, **2'**, **3'** are equal, for example, the outputs from bistable elements FF_A and FF_B will be at logical 1. These outputs are combined in the logical AND function **60** of FIG. 9 to produce a logical 1 input to the OR function **53**. This will present to the output line a logical 1 indicating that reels **1**, **2** and **3** have the same number. Similarly the other nine logical AND functions **61** to **69** shown in this figure test for all possible combinations of "three-of-a-kind." In de-

scending order of the AND functions, an output represents three cards of the same number on

AND function:	Reels
60	1, 2 and 3
61	1, 2 and 4
62	1, 2 and 5
63	1, 3 and 4
64	1, 3 and 5
65	1, 4 and 5
66	2, 3 and 4
67	2, 3 and 5
68	2, 4 and 5
69	3, 4 and 5

It will be noted that the pairs compared all have one reel in common. Thus the inputs to the AND function **60** are A and B which relate to reels **1, 2** and **2, 3** respectively—they thus have in common reel **2.**

FIG. 8 shows the logical diagram to determine the presence of a "Full House." The requirement for a full house is that three cards be of the same number and the remaining two be of the same number, not necessarily all cards be of the same number. Thus to determine whether a full house is present in the reel positions information from the three of a kind test and each one of the possible pairs is combined in the logic diagram of FIG. 8 to determine the presence of a full house. Thus the output A, B from the three-of-a-kind test of FIG. 9 is applied along with the output from the bistable element FF_D of FIG. 5, whose output depends upon the state of the two reels not involved in the three-of-a-kind test, to the logical AND function **70.** If logical 1 is applied to both inputs of **70,** then an output will appear indicating three-of-a-kind on reels **1, 2** and **3** and a pair on reels **4** and **5.** Outputs appearing on the other AND functions indicate the following "Full Houses."

AND function	Three-of-a-kind, reels	Pair, reels
70	1, 2, 3	4, 5
71	1, 2, 4	3, 5
72	1, 2, 5	3, 4
73	1, 3, 4	2, 5
74	1, 3, 5	2, 3
75	1, 4, 5	2, 3
76	2, 3, 4	1, 5
77	2, 3, 5	1, 4
78	2, 4, 5	1, 3
79	3, 4, 5	1, 2

FIG. 10 determines the presence of 4 cards of the same number, the four of a kind test. Referring to FIG. 5, if reel encoders **1', 2', 3'** and **4'** have the same number then bistable elements FF_A, FF_B, FF_C will remain on the one state. These three logical 1 levels A, B, C are combined in the logical AND function **80** which presents a logical 1 level to the OR function **85** which indicates on the output lines that reels **1, 2, 3** and **4** have the same number. Similarly outputs from the remaining AND functions **81** to **84** represent "four-of-a-kind" on the reels according to the following table.

AND function:	Reels
80	1, 2, 3, 4
81	1, 2, 3, 5
82	2, 3, 4, 5
83	1, 3, 4, 5
84	1, 2, 4, 5

FIG. 11 contains the logical mechanism to determine the presence of a straight. A straight in poker is a running sequence of cards, a typical example being 3, 4, 5, 6, 7, not necessarily in that order in the window of the poker machine. The outputs of each reel encoder are combined in a logical AND function **86** and also in a logical OR function **87.** Due to the fact that reel positions are encoded in a train of pulses the logical AND function will only present a logical one output when all five pulses are present. Thus the number of pulses coming from the logical AND function **86** must be equal to the least number of pulses presented to all its inputs. Thus we have determined the smallest number from the reel encoders. The OR function **87** will give a logical 1 level when any of its inputs is at logical 1. Thus from the logical OR function is presented the biggest number from the reel encoders. The lines containing the smallest and biggest number are compared in an exclusive OR function **88A** which determines the difference between them. This difference is applied to a 4 stage binary counter **88, 89, 90, 91** which had been previously reset to the 0 state at the beginning of the sequence of operations in the machine cycle. The counter then proceeds to count the number of pulses from the exclusive OR function **88A.** Then the content of the counter is examined by the AND function **92** to determine whether or not this count is equal to four. This AND function is inhibited if any pair exists i.e. if any two wheels have the same number. This is achieved by the OR function **93** to which are applied all of the inputs A to K from the bistable elements FF_A to FF_K of FIG. 5. If any pair exists a logical 1 level will appear at the output from the OR function **93** which is applied to the AND function **92.** Thus the condition for a straight has been established, that is, that the smallest and biggest number from the reels are separated by four and they must be in a running sequence because the possibility of a pair existing has been eliminated. When all these conditions are met the output from the straight test would be a logical 1 level.

The logic diagram of FIG. 12 performs the necessary examination of the reel positions to determine the presence of a flush. A flush is defined as 5 cards of the same suit displayed in the viewing window. The number of the card shown is immaterial. As described earlier the suit information is contained on the reels as a 2 bit binary word forming the last 2 characters on the 6 bit information on the reel. These 2 bits allow 4 possible combinations covering the four suits of the playing cards such as combinations set out in the table at the top of FIG. 12. The two bits from the wheel encoder **1'** are represented by X1 and Y1 in the wheel pickups **94, 95,** the two bits from the wheel encoder **2'** and X2 and Y2 in the wheel pickups **96, 97,** and so on. The output from pickup **94** is applied to the inverting amplifier **104** to provide the complement $\overline{X1}$ is also applied to the inverting amplifier **105** to provide the output X1. Similarly **95** is connected to the inverting amplifiers **106** and **107** to provide the outputs $\overline{Y1}$ and Y1. It will be seen that it is only if the output from **94** is 0 that the output $\overline{X1}$ is a logical 1, and similarly for all the outputs from the pickups **94** to **103.** In the code chosen, hearts is represented by a logical 0 for both bits, and a flush in hearts is indicated only if all the outputs from **94** to **103** are 0's. Accordingly a flush in hearts is indicated if all the complements $\overline{X1}$ to $\overline{Y5}$ are at logical 1. These complements are applied to the 10 input AND gate **124** which will therefore present a logical 1 to the OR gate **126** only if a flush in hearts exists. Similarly all the outputs X1 to X5 and $\overline{Y1}$ to $\overline{Y5}$ are applied to the AND gate **125,** which will present a logical 1 if a flush in diamonds exist, the outputs $\overline{X1}$ to $\overline{X5}$ to Y1 to Y5 are applied to the AND gate **127** which will present a logical 1 if a flush in clubs exists, and the outputs X1 to X5 and Y1 to Y5 are applied to the AND gate **128** which will present a logical 1 only if a flush in spades exists. As before the logical 1 at the output of the OR gate **126** is amplified and fed to the "Pay" logic section of the computer.

FIG. 13 contains the logic necessary to determine the presence of a running flush. A running flush consists of a straight in the same unit. Thus the outputs from the straight test and flush test of FIGS. 11 and 12 are examined in the logical AND function **129.** If they are both at logical 1 a running flush exists.

FIG. 14 contains a logic necessary to determine the presence of a royal routine. A royal routine is defined as five cards in the same suit being 10 Jack Queen King Ace. It can be seen that the sequence of cards is the same as a straight but starting at a particular point greater than 9. Thus the logic will only respond to an output from the straight test if that output has occurred for any reel encoder being greater than 9. This output has to be coincident with a logical 1 from the flush test to comply with the requirements for a royal routine. If all these conditions are fulfilled the logical 1 appears at the output for the royal routine test.

Referring to the logic diagram, Toggle circuit U is set by the 9th clock pulse, and this enables the AND gate **131** which is fed from point M in the straight test(FIG. 11). This part of the logic permits signals from cards 10 or higher only entering the three-stage binary counter **132, 133, 134.** These signals are counted and if there are four input pulses the levels at point $\overline{V}$, $\overline{W}$ and $\overline{Z}$ will enable the five input AND gate **135.** The other 2 inputs: one from the Flush test and the other N from the Straight test (which performs the same safeguard against a "Pair") complete the logic requirement for a Royal Routine.

FIG. 15 contains a logical function for determining a gold award. A gold award is a paying combination not found in poker but sometimes found desirable for certain customers of poker machines. This test is achieved by allotting the number 15 to the gold award card on the reel. The test is carried out by a logical AND function **136** which combines the outputs from each reel encoder **1'** to **5'** with the 15th pulse from the timing clock. If all inputs to the logical AND function exist then a logical 1 appears on the output of the gold award test. It will be seen that all reel encoder outputs have to be a train of 15 pulses for the six input AND gate **136** to open at the 15th pulse from the clock. If this occurs toggle circuit **137** is set and a logical "1" is passed on to the pay logic section of the computer.

The preferred distribution of card faces on the 5 reels of the machine is so calculated as to provide as random an occurrence of cards as possible consistent with a true hand of poker and the statistical payment required. Each reel may accommodate 16 cards (excluding gold award) giving a total of 80 positions to be filled by only 52 cards in a standard pack. This may be done for example by duplication of 28 cards, preferably in the higher suits, with identical cards occurring on the same reel to avoid the same card occurring twice in the one hand. Duplication of every card is a possible alternative by using sevens and up in each suit as indeed many other combinations may be determined. However this latter distribution provides the least range of hands, which is undesirable. The general concept nevertheless remains the guide namely to provide as many different 5-card hands as possible.

What is claimed is:

1. A poker machine comprising five reels on which indicia representing individual cards of a deck of cards are displayed, winning combinations being characterized by particular combinations of indicia displayed in a window, each reel having on one side thereof a plurality of concentric tracks each formed by conductive parts and nonconductive parts, means to apply a potential to the conductive parts, said potential on a conductive part corresponding to a logical bit of digital information, means for sensing the potentials on the tracks at the position corresponding to the indicia displayed, a logic unit connected to receive said sensed potentials as electrical information in binary digital form, means for examining outputs from the logic unit sequentially starting with the combination having the most significance and proceeding to the lowest significance, means to generate a number corresponding to the number of coins allotted to a particular combination if the examination shows that that particular combination exists, and means to dispense a number of coins equal to said number generated.

2. A poker machine as claimed in claim **1,** in which the indicia comprises the values of the cards encoded on said tracks as a four bit binary number, the suits of the cards encoded on said tracks as a two bit binary number and a pictorial representation of the cards about the circumference of said reels.

3. A poker machine as claimed in claim **1,** in which the logic unit comprises means to determine pairs comprising exclusive OR circuits equal in number to the number of combinations of the reels taken two at a time, means to apply the digital information from the reels in pairs to the exclusive OR circuits, and one means for each exclusive OR circuit giving a pair output when two identical pieces of digital information are applied to the exclusive OR circuits.

4. A poker machine as claimed in claim **3,** in which means to generate a number comprises an OR circuit, means to apply said pairs output corresponding to the comparisons between adjacent reels to the OR circuit, means to generate a number equal to the number of coins for a pair when the OR circuit gives an output.

5. A poker machine as claimed in claim **4,** in which the logic unit further comprises means to determine two pairs comprising a plurality of AND circuits, means to apply said pairs outputs in pairs to the AND circuits in such manner that the second pair output does not include digital information from either of the reels which provided information for the first pair output, an OR circuit fed by said AND circuits, and means responsive to the output from said OR circuit to generate a two pair output from the logic unit when the OR circuit output indicates that two sets of equal information have been taken from the reels.

6. A poker machine as claimed in claim **5,** in which the logic unit further comprises means to determine three of a kind comprising a second plurality of AND circuits, means to apply said pairs outputs in pairs to said second plurality of AND circuits in such manner that the second pair output includes digital information for the first pair output, an OR circuit fed by all said AND circuits, and means responsive to the output from said OR circuit to generate a three of a kind output from the logic unit when the OR circuit output indicates that three sets of equal information have been taken from the reels.

7. A poker machine as claimed in claim **6,** in which the logic unit further comprises means to determine a full house comprising a first set of ten AND circuits, means to apply said pairs outputs in pairs to said first set of AND circuits in such manner that the second pair output includes digital information on the state of one reel which provides digital information for the first pair output, a second set of ten AND circuits, each AND circuit of the second set having applied to it the output from one of the AND circuits of the first set that output of the pair outputs which indicates the states of the two reels which have not provided information for the first set of AND circuits, an OR circuit fed by all said second set of AND circuits, and means responsive to the output from said OR circuit to generate a full house output from the logic unit when the OR circuit output indicates that two sets of equal information and three sets of equal information have been taken from the reels.

8. A poker machine as claimed in claim **7,** in which the logic unit further comprises means to determine four of a kind comprising a plurality of AND circuits equal to the number of combinations of the reels taken four at a time, each AND circuit having applied to it three of the pair outputs, such that in each set of three outputs the first and second outputs are derived from digital information which includes information from a common reel, and the second and third outputs are derived from digital information which includes information from a second common reel, and an OR circuit fed by all of said AND circuits, and means responsive to the output from said

OR circuit to generate an output from the logic unit when the OR circuit output indicates that four identical sets of digital information have been taken from the reels.

9. A poker machine as claimed in claim **1**, wherein the reels bear indicia corresponding to the cards of a deck of playing cards, the suits of the cards being encoded on said tracks as a two bit binary number, and in which said logic unit further comprises means to determine the suits comprising four AND circuits, means to apply the encoded suit information from the reels to the AND circuit which relates to said suit, an OR circuit fed by all said AND circuits, and means responsive to an output from said OR circuit to generate an output from the logic unit when the OR circuit output indicates that five identical sets of suit information have been taken from the reels.

10. A poker machine as claimed in claim **1**, in which said logic unit further comprises means to determine a straight comprising an AND circuit to which the digital outputs from all reels are applied, an OR circuit to which the digital outputs from all reels are applied, an exclusive OR circuit to which the output of the AND circuit and the OR circuit are applied, a counter to which the output from the exclusive OR circuit is applied, an AND circuit to examine the state of the counter and determine whether the count is equal to four, means to inhibit the last mentioned AND circuit if a pair exists, and means responsive to the output from the last mentioned AND circuit to generate an output from the logic unit when this last mentioned output indicates information denoting a straight has been taken from the reels.

11. A poker machine as claimed in claim **10**, wherein the reels bear indicia corresponding to the cards of a deck of playing cards, the suits of the cards being encoded on said tracks as a two bit binary number, and in which said logic unit further comprises means to determine the suits comprising four AND circuits, means to apply the encoded suit information from the reels to the

AND circuit which relates to said suit, an OR circuit fed by all said AND circuits, and flush determining means responsive to an output from said OR circuit to generate an output from the logic unit when the OR circuit output indicates that five identical sets of suit information have been taken from the reels, further comprising a further AND circuit to which the output from the straight determining means is applied, a three stage binary counter fed from the said further AND circuit, a five input AND circuit fed from the three counter stages with the outputs from the flush determining means and the straight determining means, whereby an output from the logic unit is generated when a straight flush is displayed by the machine.

12. A poker machine as claimed in claim **11**, further comprising means for generating a series of clock pulses, each pulse being indicative of a higher sequential numerical value of a suit, and means to enable said further AND circuit only after a ninth clock pulse so that the lowest numerical value of the suit displayed is ten whereby an output from said logic unit is generated when a straight flush of low number 10, called a royal routine, is displayed by the machine.

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