March 30, 1965 G. R. DAVIS 3,175,826

DICE MACHINE TABLE

Filed Jan. 18, 1963 4 Sheets-Sheet 1

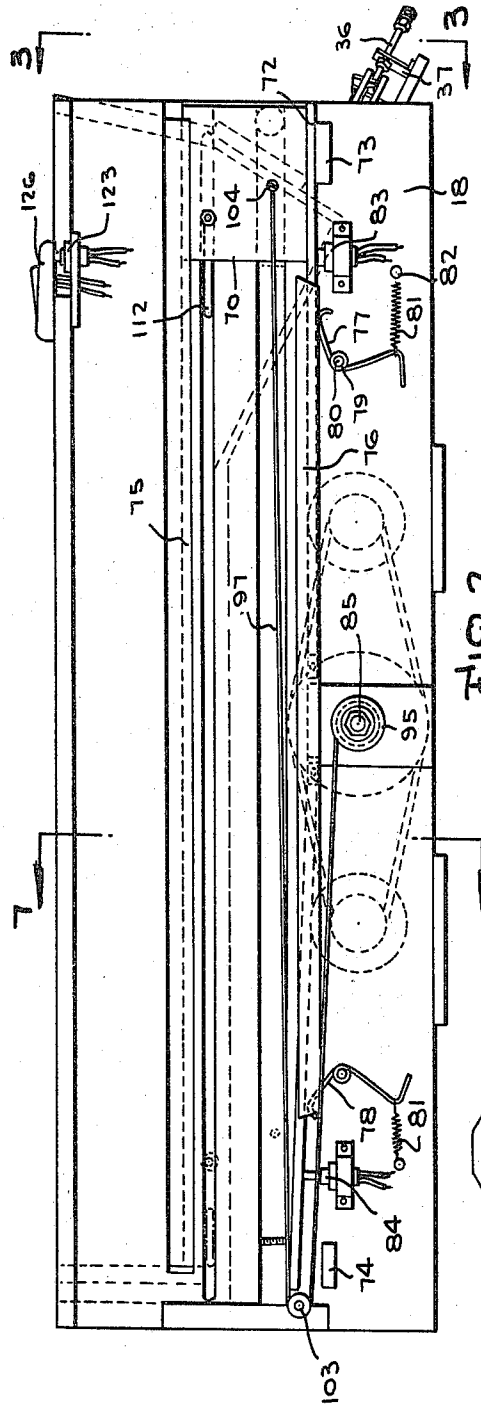


FIG. 2

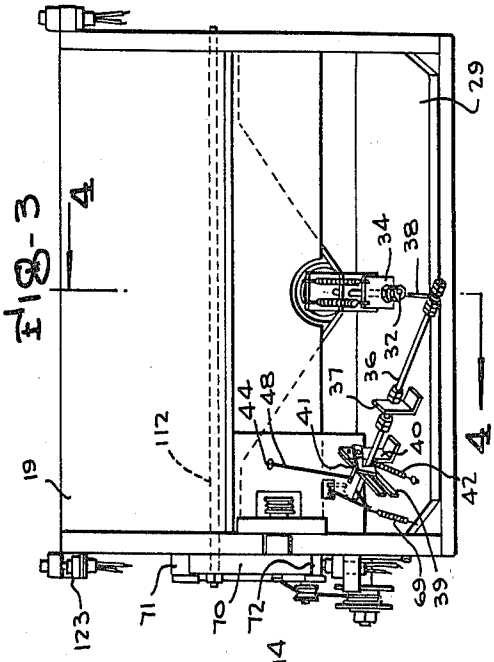


FIG. 3

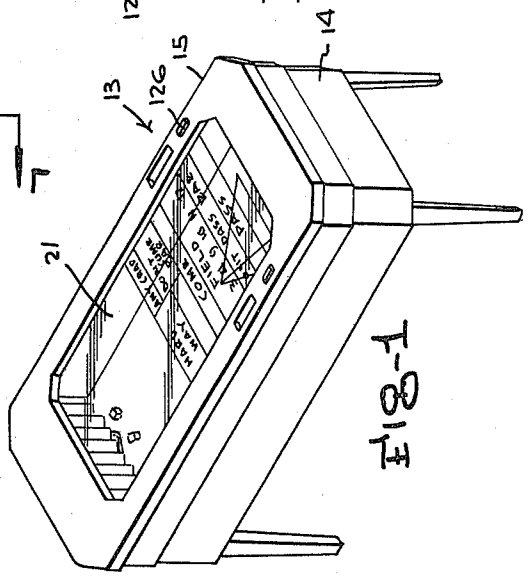


FIG. 1

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DICE MACHINE TABLE

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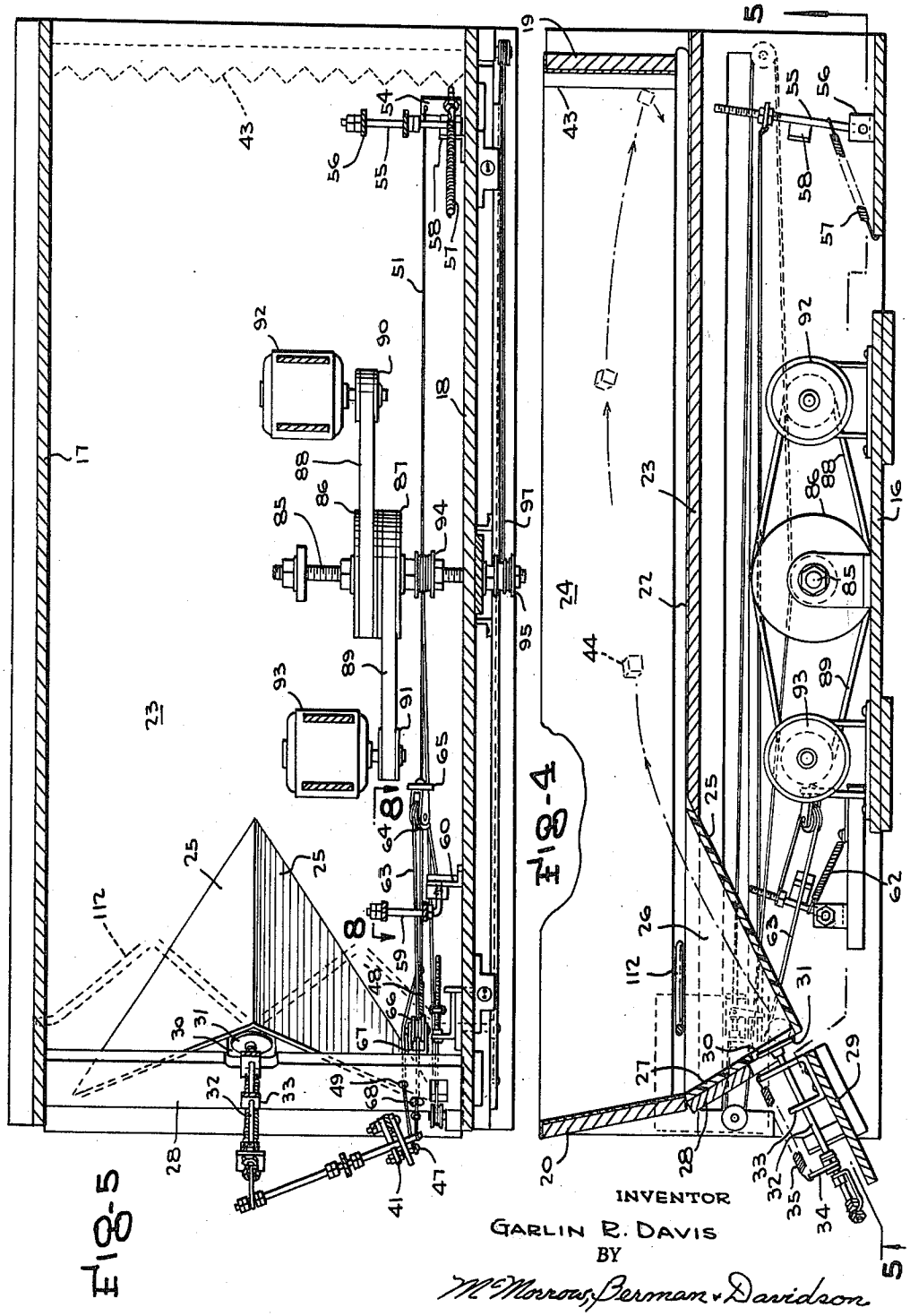


FIG-5

FIG-4

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March 30, 1965 G. R. DAVIS 3,175,826

DICE MACHINE TABLE

Filed Jan. 18, 1963 4 Sheets-Sheet 3

Fig-6

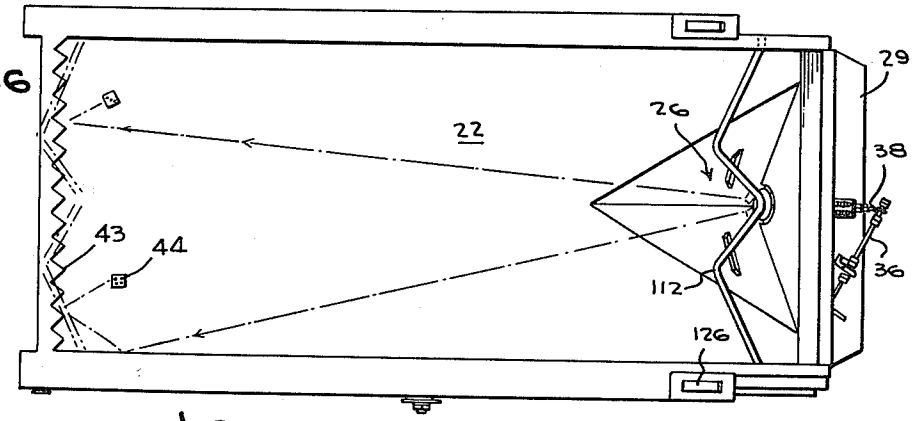
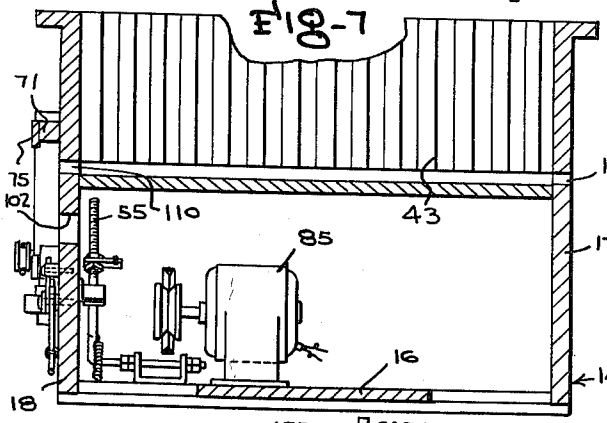


Fig-7



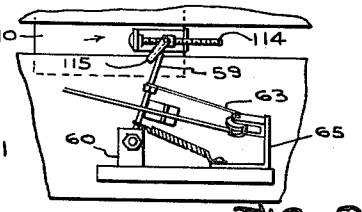
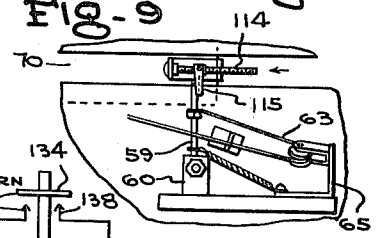


Fig-8

Fig-9



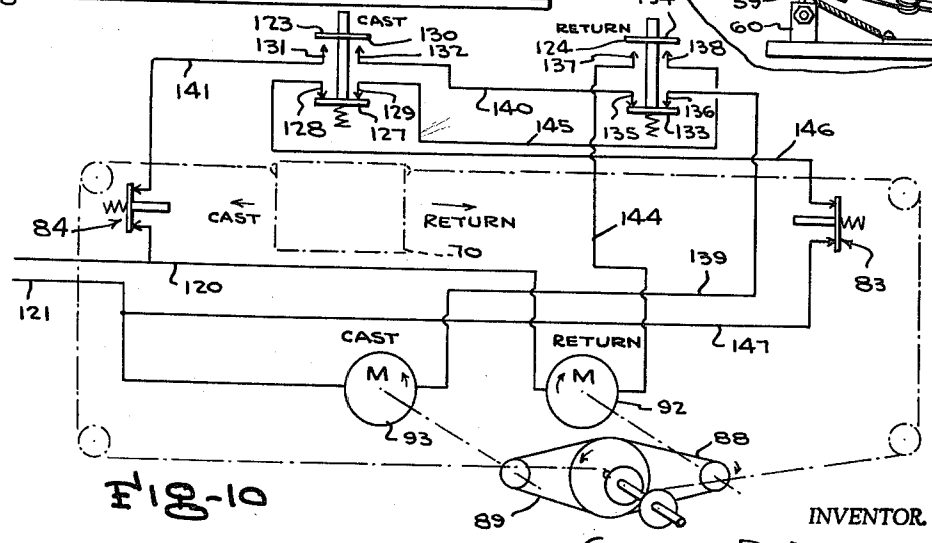


Fig-10

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DICE MACHINE TABLE

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Fig-11

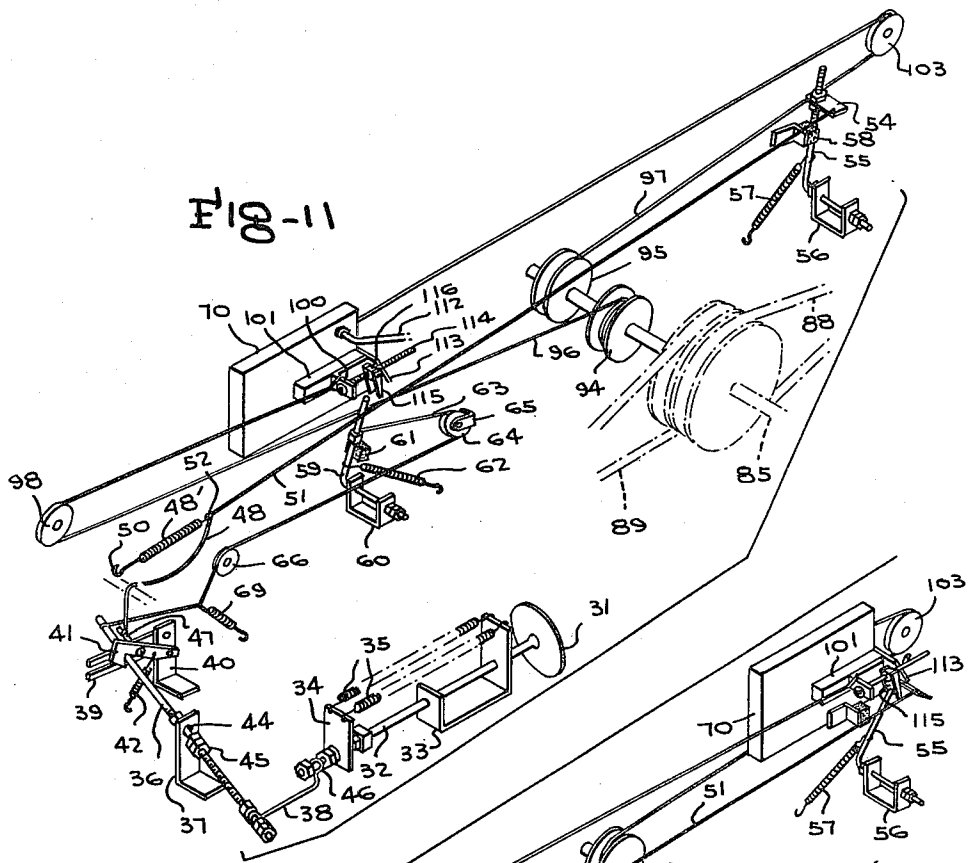


Fig-12

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United States Patent Office 3,175,826 Patented Mar. 30, 1965

3,175,826

DICE MACHINE TABLE

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Filed Jan. 18, 1963, Ser. No. 252,361
15 Claims. (Cl. 273—145)

This invention relates to amusement devices, and more particularly to a machine for playing dice games.

A main object of the invention is to provide a novel and improved mechanical dice table which is relatively simple in construction, which is easy to operate, and which provides a means of playing dice games without actually handling the dice.

A further object of the invention is to provide an improved machine for playing dice games, said machine being durable in construction, being attractive in appearance, and being provided with mechanically operated means for throwing dice upon a dice table and for returning the dice to starting positions for subsequent throws, the operations being performed completely by the machine and without the necessity of the operator handling or touching the dice.

A still further object of the invention is to provide an improved mechanical dice table apparatus which is relatively compact in size, which is reliable in operation, and which is relatively inexpensive to fabricate.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a perspective view of an improved dice machine table apparatus constructed in accordance with the present invention.

FIGURE 2 is an enlarged side elevational view, with the main housing removed, of the dice machine table apparatus of FIGURE 1.

FIGURE 3 is a front elevational view taken substantially on the line 3—3 of FIGURE 2.

FIGURE 4 is a vertical longitudinal cross sectional view taken substantially on the line 4—4 of FIGURE 3.

FIGURE 5 is a horizontal cross sectional view taken substantially on the line 5—5 of FIGURE 4.

FIGURE 6 is a top plan view of the dice machine table of FIGURE 1 with the main housing removed.

FIGURE 7 is a transverse vertical cross sectional view taken substantially on the line 7—7 of FIGURE 2.

FIGURE 8 is a fragmentary elevational view taken substantially on the line 8—8 of FIGURE 5 showing the manner in which the resetting arm of the apparatus is free to move past the resetting lever at the initial stage of the dice-casting operation of the apparatus.

FIGURE 9 is a fragmentary elevational view similar to FIGURE 8 but showing the resetting arm moving in a direction opposite to that illustrated in FIGURE 8, wherein the resetting arm cooperates with the resetting lever to reset the apparatus as the dice are being returned to the dice-collection recess at the forward portion of the casting board of the apparatus.

FIGURE 10 is an electric circuit diagram showing the electrical connections of the various elements of the dice machine table apparatus of FIGURES 1 to 9.

FIGURE 11 is a fragmentary perspective view showing the cable connections of the dice machine table apparatus of FIGURES 1 to 10 with the parts arranged in the positions at the beginning of a dice-casting operation of the apparatus.

FIGURE 12 is a perspective view, similar to FIGURE 11, but showing the positions of the parts at the end of the dice-casting operation of the apparatus and prepared for operation to return the dice to the collection recess at the forward portion of the casting board.

Referring to the drawings, 13 generally designates an improved dice machine table apparatus constructed in accordance with the present invention. The apparatus 13 comprises a generally rectangular main supporting box 14 provided with the main top cover housing 15. The rectangular supporting box 14 comprises the horizontal bottom wall 16 and the vertical longitudinally extending side walls 17 and 18. The playing board housing 15 is suitably secured on the top edges of the side walls 17 and 18 and is provided with a transparent top window 21 through which may be observed a playing board 22 provided on a horizontal intermediate partition wall 23 secured between the side walls 17 and 18 of the box 14. An upper playing compartment 24 is thus defined above the playing board 22, said playing compartment being provided with a transversely extending vertical rear wall 19, secured between the rear portions of the side walls 17 and 18, and with the upwardly and forwardly inclined front wall 20 secured between the forward portions of side walls 17 and 18.

The horizontal partition wall 23 is formed at its forward end portion with a generally triangular aperture in which are secured downwardly convergent generally triangular side wall elements 25, 25 of a dice collection recess 26, said recess 26 being provided with the upwardly and forwardly inclined, generally triangular front wall element 27, which is supportingly secured on a similarly inclined transversely extending plate-like member 28 secured between the side walls 17 and 18. A transversely extending downwardly and forwardly inclined plate member 29 is secured between the side walls 17 and 18 below the plate member 28, the member 29 being substantially in alignment with the line of intersection between the recess walls 25, 25, as shown in FIGURE 4. The lower end of the wall 27 is centrally formed with an aperture 30 in which is normally positioned the enlarged head or flange 31 secured on the end of a plunger rod 32 slidably supported in the arms of a U-shaped bracket 33 secured on the inclined plate member 29, as shown in FIGURE 4.

Secured on the plunger member 32 is a plate member 34 which is connected by a pair of coiled springs 35, 35 to one of the arms of the bracket 33, biasing the plunger rod 32 to the right, as viewed in FIGURES 4 and 11, namely, urging the plunger head 31 into the recess 26.

Designated at 36 is a catch lever which is pivotally mounted at its intermediate portion on an upstanding bracket 37 secured to the plate member 29, one end of the lever 36 being connected by a link rod 38 to the outer end of the plunger rod 32. The opposite end of the catch lever 36 extends slidably through a slotted guide plate 39 secured on an upstanding bracket 40 fastened to the plate member 29, a detent hook 41 being pivoted to the upstanding bracket 40 and normally lockingly engaging over the lever 36 by the action of a biasing spring 42 connected between the pivoted detent hook arm 41 and the plate member 29. Thus, as shown in FIGURE 11, the pivoted hook 41 normally holds the lever 36 against rotation in a counterclockwise direction, as viewed in FIGURE 11, under the force of the biasing springs 35. Thus, the hook member 41 normally holds the plunger rod 32 in the retracted position thereof, shown in FIGURE 4, wherein the plunger head member 31 is positioned substantially in the aperture 30.

As will be readily apparent, when the hook member 41 is rotated in a clockwise direction, as viewed in FIGURE 11, the hook member 41 disengages from the lever 36, allowing the lever 36 to be rotated counterclockwise under the force of the springs 35, and allowing the plunger rod 32 to be propelled to the right, as viewed in FIGURE 11, causing the head member 31 to move rapidly through the aperture 30 and into the recess 26. As will be present-

ly explained, the dice which have gravitated to the bottom of the recess and which normally engage against the plunger head 31 are thus propelled rearwardly, in the manner shown in dotted view in FIGURE 4, to strike against a corrugated vertical liner member 43 secured to the rear wall 19 in the playing compartment 24.

The vertically corrugated liner member 43 extends for the full area of the rear wall 19, and the vertical corrugations thereof define forwardly projecting vertical ridges against which the dice, shown at 44 are propelled, causing the dice to be deflected forwardly therefrom in random manner. As shown in FIGURE 1, the transparent window 21 has inscribed thereon, for example, by being imprinted on its underside, various pieces of playing information relating to the rules and procedure of the game, and defining these procedures in terms of the scoring values obtained from the throws of the dice.

As will be readily apparent from FIGURES 11 and 12, the upstanding bracket 37 is provided with an aperture in its top portion, shown at 44, which is substantially larger than the cross sectional size of the rod 36, and respective pairs of stop nuts 45, 45 are provided on the rod on opposite sides of the bracket 37 to limit longitudinal movement of the lever rod 36 relative to the bracket 37. The connections of the opposite ends of the link rod 38 to the plunger rod 32 and lever rod 36 are made in a similar fashion, the link rod 38 being formed with loops or eyes 46 at its opposite ends which surround the rods and which are large enough to freely pivot with respect to the rods, being retained on the rods by nuts provided on said rods on opposite sides of said loops.

Rigidly secured to and projecting perpendicularly from the pivoted hook member 41 is a pin 47 to which is connected one end of a flexible cable 48. The cable 48 extends through an aperture 49 in the transverse plate member 28 and is connected to one end of a coiled spring 48', the other end of the coiled spring, shown at 50, being connected to the wall 27. A further cable 51 connects the first-named end 52 of spring 48' to an arm 54 rigidly secured on a lever 55 which is pivoted in a U-shaped bracket 56 secured to the bottom wall 16. As shown in FIGURE 11, the lever 55 is generally L-shaped, the lower portion thereof extending through the upstanding arms of the U-shaped bracket 56 and the upper portion projecting upwardly and having the plate member 54 rigidly secured thereto. A coiled spring 57 connects the upstanding arm of the lever 55 to the bottom wall 16, biasing the lever in a counterclockwise direction, as viewed in FIGURES 4 and 11, and urging the upstanding arm against a cushioned stationary abutment member 58 secured to the side wall 18. As will be readily apparent, when the lever 55 is rotated in a clockwise direction, as viewed in FIGURE 11, the cable 51 and the cable 48 are tensioned, as shown in FIGURE 12 to raise the hook member 41 and disengage same from the lever 36, releasing the lever and allowing the springs 35 to propel plunger rod 32 inwardly into the recess 26.

The lever 36 may be moved toward reset position by the action of a reset lever 59 which is pivoted in a U-shaped bracket 60 to the bottom wall 16, the lever 59 being urged against a cushion stop 61 secured to side wall 18 by the action of a biasing spring 62 connecting the upstanding portion of the lever to the bottom wall 16, as shown in FIGURE 11. A flexible cable 63 connects the upstanding portion of the L-shaped lever 59 to the end portion of lever 36 outwardly adjacent to the slotted guide member 39. As shown in FIGURE 11, the cable 63 passes around a first pulley 64 journaled to an upstanding bracket 65 (FIGURE 5) secured on the bottom wall 16, and over a second pulley 66 journaled in a bracket 67 secured to wall 27, the cable passing through an aperture 68 in the transverse wall member 28, as shown in FIGURE 5. A tensioning spring 69 connects the flexible cable 63 to transverse plate member 29, as shown in FIGURE 3, tensioning the cable so as to urge the upstanding arm of

lever 59 against the cushioned stop member 61, as well as to urge the lever member 36 in a clockwise direction, as viewed in FIGURE 11, namely, toward resetting position.

The springs 35 are substantially more powerful than the spring members acting to tension the cable element 63, so that when the latch member 41 is disengaged from the lever 36 the springs 35 provide rapid forward propulsion of the plunger rod 32, the springs 69 and 62 yielding readily to the force exerted on the lever member 36 by the springs 35, 35. To return the lever member 36 towards reset position, namely, the position thereof shown in FIGURE 11, it is necessary to rotate the L-shaped resetting lever 59 in a counterclockwise direction, as viewed in FIGURE 11, namely, in a direction to move the lever 36 from the position of FIGURE 12 to the position of FIGURE 11. This reset movement of the lever 36 causes the lever to slip beneath the edge of the detent hook 41 and to lockingly engage beneath said detent hook in the position of FIGURE 11.

As will be apparent from FIGURE 5, the respective L-shaped levers 55 and 59 are substantially longitudinally aligned and their upstanding arms are located adjacent to the side wall 18. Designated at 70 is a vertical, generally rectangular block member which is slidably mounted for movement along the external surface of side wall 18, the top edge of the block member 70 being engaged by a horizontal, longitudinally extending guide strip 71 secured to the side wall 18 and the bottom edge of said block slidably engaging on a rocking bar 72 supported on outwardly projecting lugs 73 and 74 rigidly secured to the opposite end portions of side wall 18, as shown in FIGURE 2. As shown in FIGURE 7, the stationary top guide strip 71 is provided with a retaining flange 75 which retains the block 70 beneath the stationary guide strip 71. Secured on the outer edge of the rocking bar member 72 is a similar retaining strip or flange 76 which is engageable with the lower marginal portion of the block 70 to retain the block on the rockable bar 72.

Respective biasing springs 77 and 78 are pivoted to side wall 18 below the opposite end portions of the rocking bar 72, said springs comprising relatively stiff wire formed with center coils 79 which are rotatably mounted on pins 80 secured to side wall 18, the upper arms of said stiff wire springs bearing on the bottom surface of the rockable bar 72 and the lower arms thereof being connected by coiled springs 81 to pins 82 secured to the side wall 18, as shown in FIGURE 2. Thus, the spring member 77 is biased by its coiled spring 81 in a counterclockwise direction, as viewed in FIGURE 2, whereby its upper arm bears upwardly and resiliently on the right end of the rockable bar member 72 in FIGURE 2, and the spring member 78 is biased in a clockwise direction by its coiled spring 81, so that its upper arm bears upwardly and resiliently on the left end portion of the rockable bar member 72. Therefore, when the block 70 is at the right end of its travel, as shown in full line view in FIGURE 2, the left spring member 78 deflects the left end portion of the bar member 72 upwardly away from its supporting lug 74. As the block 70 moves to the left towards its dotted view position thereof shown in FIGURE 2 the left end portion of the rockable bar member 72 is depressed and the right end portion thereof rises. As shown in FIGURE 2, respective microswitches 83 and 84 are mounted on the side wall member 18 beneath the right and left end portions of the rockable bar member 72, the microswitch 83 being opened when the block member 70 is in the full line position thereof shown in FIGURE 2, namely, at its rightward limit of travel, as shown in FIGURE 2, whereas the microswitch 84 is opened when the block member 70 is at its leftward limit of travel, namely, in the dotted view position thereof shown in FIGURE 2. Both of the microswitches 83 and 84 are normally in closed positions, namely, are internally biased to close, and are only opened when the block member 70 acts to depress one or the

other of the end portions of the rockable bar member 72.

Journaled to the side wall 18 and extending transversely therethrough is a shaft member 85 provided with respective pulleys 86 and 87 rigidly secured thereto and drivingly coupled by its belts 88 and 89 to respective drive pulleys 90 and 91 mounted on the shafts of electric motors 92 and 93. The motors 92 and 93 are mounted on the bottom wall 16 and are arranged to drive the shaft 85 in opposite directions responsive to their respective energizations. Secured on the shaft 85 are respective cable reels 94 and 95 on which are wound respective opposite directed cables 96 and 97. The cable 96 extends leftward, as viewed in FIGURE 11, around a pulley 98 journaled to side wall 18 and thence rightward, being connected to a bracket 100 mounted on a longitudinally extending block 101 rigidly secured to the inside face of block 70, the block 101 extending through a longitudinal slot 102 provided in the side wall 18.

The cable 97 extends to the right, as viewed in FIGURE 11, around a pulley 103 journaled to the end portion of wall 18, said cable 97 being secured to a stud 104 projecting outwardly from the outer face of block 70.

It will be seen from FIGURE 11 that when shaft 85 is rotated in a counterclockwise direction, for example, by the energization of the motor 93, the cable 97 is wound up on the reel 95, causing the block 70 to move to the right, as viewed in FIGURE 11. Conversely, when the shaft 85 is driven in a clockwise direction, as viewed in FIGURE 11, namely by the energization of the motor 92, the cable 96 is wound up on the reel 94, causing the block 70 to move toward the left, as viewed in FIGURE 11. As will be presently explained, rightward movement of the block member 70 in FIGURE 11 corresponds to the casting portion of the cycle of operation of the device, namely, the portion wherein the dice are propelled outwardly from the recess 26, whereas leftward movement of the block member 70 in FIGURE 11 corresponds to the return movement of the dice to the recess, by means presently to be described.

Rigidly secured to the block member 70 and extending slidably through respective horizontal longitudinally extending guide slots 110 and 111 provided in the side walls 18 and 17 adjacent to and immediately above the plane of the playing board element 22 is a transversely extending, generally W-shaped rake member 112 which is arranged in a horizontal plane close to the plane of the playing surface member 22. The rake member 112 is moved with the block member 70, and moves rearwardly, namely, from the forward portion of the apparatus toward the rear portion thereof during the casting portion of the cycle of operation of the apparatus. Thus, during this phase of operation the rake member 112 moves from the full line position thereof shown in FIGURE 6 to the dotted view position thereof, wherein the rake member is disposed substantially beneath the bottom edge of the vertically corrugated rebound member 43. Upon return movement of the block member 70 the rake member 112 moves forwardly along the surface of member 22 and gathers the dice 44, moving the dice toward the collection recess 25, and ultimately depositing the dice in said recess as said rake member returns to the full line position thereof shown in FIGURE 6.

Rigidly secured to the right end of block 101, as viewed in FIGURE 11, is the downwardly and rearwardly inclined abutment plate 113. A longitudinally extending bolt member 114 is rigidly secured to the bracket member 100 and extends past and adjacent to the inside edge of the plate member 113. A depending channeled arm 115 is pivoted to a nut 116 adjustably positioned on the bolt 114, the arm 115 being limited in its rotation around the axis of bolt 114 to a depending vertical position, such as that shown in FIGURE 11. The depending arm 115 is free to pivot in a clockwise direction, as viewed in FIGURE 11, but is restrained against pivoting in a counterclockwise direction by stop means provided at its upper portion which engages with the bolt 114. Thus, the arm 115 may pivot to the inclined position thereof shown in FIGURE 8 when the block 70 is moving toward the right with the arm 115 engaging the top end of the lever member 59, whereas the arm 115 is constrained to remain vertical when the block member 70 moves to the left and said arm 115 engages the top end portion of lever 59.

As will be apparent from FIGURES 11 and 12, the top end portions of the lever members 55 and 59 project upwardly and are normally in the plane of the depending channel-shaped arm 115. When the block 70 has moved sufficiently to the right from the starting position thereof, for example, to the position thereof shown in FIGURE 12, the plate 113 rotates the lever 55 in a clockwise direction from the position thereof shown in FIGURE 11, causing the cable 51 and the cable 48 to elevate the hook member 41, releasing the plunger rod 32, as above described. Simultaneously with this action the rake member 112 has been moved to the dotted view position thereof shown in FIGURE 6, namely, to the position wherein it underlies the vertically corrugated rebound member 43. Upon return movement of the block member 70, the rake member 112 is moved to gather the dice and return them to the collection recess 26, and at the end portion of its return movement the arm 115 engages the top end of the lever member 59, rotating the lever member in a counterclockwise direction from the position thereof shown in FIGURE 12, causing the cable 63 to rotate the lever member 36 to a position wherein it is lockingly engaged beneath the hook member 41, whereby the apparatus is reset for the next cast.

The motors 92 and 93 are selectively energized from a pair of line wires 120 and 121 through respective manually operated "cast" and "return" pushbutton switches 123 and 124 mounted on the top portions of the opposite side walls 17 and 18 and exposed through suitable apertures provided thereof at the opposite side margins of the top cover 15, said side margins being provided with suitable pushbutton means, such as pushbutton means 126 shown in FIGURE 2, for actuating the pushbutton switches 123 and 124.

As shown in FIGURE 10, the switches 123 and 124 are of the double-pole double-throw type, being normally biased upwardly by conventional spring means contained therein. The bottom pole 127 of the switch 123 normally bridges a pair of contacts 128 and 129, and the top pole 130 of this switch is engageable with a pair of contacts 131 and 132 when the pushbutton of the switch is depressed, this causing pole 127 to disengage from the contacts 128 and 129. Similarly, the switch 124 has a bottom pole 133 and a top pole 134, the bottom pole normally engaging a pair of contacts 135 and 136 and the top pole being engageable with a pair of contacts 137 and 138 when the pushbutton element of the switch is depressed. The "cast" motor 93 is connected between line wire 121 and line wire 120 through a circuit which includes the wire 121, the motor 93, a wire 139, contact 136, pole 133, contact 135, a wire 140, contact 132, the pole 130, a wire 141, the normally closed microswitch 84 and the line wire 120. The "return" motor 92 is connected to the line wire through a circuit comprising line wire 120, the motor 92, a wire 144, contact 137, pole 134, contact 138, a wire 145, contact 129, pole 127, contact 128, a wire 146, the microswitch 83, and a wire 147, which is connected to line wire 121.

Under normal conditions, both microswitches 83 and 84 are closed. When the "cast" pushbutton is depressed, the motor 93 is energized by the above described circuit, and energization of the "return" motor 92 is prevented by the disengagement of pole 127 from contacts 128 and 129. Energization of the motor 93 moves the block member 70 to the right, as viewed in FIGURE 11, causing the operation previously described which allows push rod 32 to propel the dice forwardly onto the playing

board after rebounding from the corrugated member 43.

As previously mentioned, the release of the dice-projecting plunger 32 does not occur until block 70 moves sufficiently to cause plate 113 to rotate lever member 55. Shortly thereafter the microswitch 84 is opened by the rocking action of the bar 72, previously described, terminating the energization of motor 93. To return the dice the "return" switch 124 is actuated, causing the motor 92 to become energized through the circuit above described, and preventing energization of the "cast" motor 93 by the disengagement of pole 133 from contacts 135 and 136. The return movement of the block 70 causes the arm 115 to rotate the lever 59 to reset the lever 36, as above described, namely, to cause the lever to engage beneath the hook member 41. Shortly after this has been accomplished the microswitch 83 opens, terminating energization of the "return" motor 92. Microswitch 83 is opened by the return rocking movement of the rockable bar member 72, above described, caused by the return movement of the block 70 to the full line position thereof shown in FIGURE 2.

As will be apparent from FIGURES 8 and 9, after the resetting action has taken place, namely, the rotation of lever member 59 in a counterclockwise direction by the arm 115, said arm may slip past the lever member to the position thereof shown in FIGURE 8. Thus, the arm 115 may move to the left from the position of FIGURE 9 to the position of FIGURE 8 before microswitch 83 opens to deenergize motor 92. However, the arm 115 is free to pivot in a clockwise direction, so that it will move past the top end of the lever 59 when the block 70 moves to the right from the position thereof shown in FIGURE 8, at the beginning of the "cast" action.

The triggering of the plunger 32 occurs when the plate member 113 engages the top end portion of the L-shaped lever 55, causing said lever to be rotated clockwise, as above described, whereby the hook member 41 is elevated to release the lever 36. FIGURE 12 shows the lever 55 in its clockwise-rotated position as it is engaged by the bottom edge portion of plate member 113. As above explained, a very short time after this action takes place the microswitch 84 is opened, terminating the energization of the motor 93.

Summarizing, in operation, to cast the dice, the actuator 126 operatively associated with the "cast" pushbutton switch 123 is depressed, causing the motor 93 to become energized, causing the block 70 to be moved rearwardly, namely, to the right as viewed in FIGURE 11. The rake member 112 is carried toward the rear end of the apparatus, moving beneath the vertically corrugated rear wall member 43. As the block 70 moves rearwardly, the rocker bar 72 is tilted in a counterclockwise direction, as viewed in FIGURE 2. As the plate member 113 engages lever 55, the plunger rod 32 is released, as above described, propelling the dice 44 against the vertically corrugated rebound member 43. Shortly thereafter the rocker bar 72 opens microswitch 84 terminating the energization of the motor 93. To return the dice for the next cast, the actuator 126 associated with the "return" pushbutton switch 124 is depressed, energizing the motor 92, thereby causing return movement of the block member 70.

The rake member 112 is moved forwardly with the block member 70, gathering the dice and moving same into the collection recess 26. As the block member 70 moves past the lever 59 the arm 115 engages the top end of the lever and rotates it counterclockwise, as viewed in FIGURE 11, pulling the lever 36 back beneath the hook-shaped arm 41 so as to reset the plunger rod 32 for the next cast. Following the resetting of plunger rod 32, the rocker arm 72 opens the microswitch 83, terminating the energization of the motor 92.

While a specific embodiment of an improved dice casting and return machine has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A mechanical dice throwing apparatus comprising a board having a collection recess at its forward end containing dice, a block member slidably mounted at one side of said board and being normally in a position adjacent the forward end of the board, a rake member secured to said block member and extending transversely over the board, an upstanding fixed rebound wall at the rear end of the board, a propulsion plunger in said collection recess engageable with the dice to propel same from the recess, means to move said block member rearwardly to a position wherein said rake member is subjacent said fixed rebound wall, means actuating said propulsion plunger responsive to the movement of said block member to said position, whereby to propel the dice from said recess against said fixed rebound wall, means to return the block member to its normal position, and means on the rake member engageable with the dice to move them forwardly toward said collection recess.

2. A mechanical dice throwing apparatus comprising a board having a collection recess at its forward end adapted to contain dice, a block member slidably mounted at one side of said board and being normally in a position adjacent the forward end of the board, a horizontal rod-like rake member secured to said block member and extending transversely over the board, said rake member having at least one substantially V-shaped forwardly facing portion, an upstanding fixed rebound wall at the rear end of the board, a propulsion plunger in said collection recess engageable with dice therein to propel same from the recess, means to move said block member rearwardly to a position wherein said rake member is subjacent said fixed rebound wall, means actuating said propulsion plunger responsive to the movement of said block member to said position, whereby to propel the dice from said recess against said rebound wall, means to return the block member to its normal position, said rake member being engageable with the dice to move them forwardly toward said collection recess, spring means biasing said plunger in a direction to propel said dice from the recess, and means to tension said spring means responsive to the return of the block member to said normal position.

3. A mechanical dice throwing apparatus comprising a board having a collection recess at its forward end adapted to contain dice, a block member movably mounted at one side of said board and being normally in a position adjacent the forward end of the board, a rake member secured to said block member and extending transversely over the board, an upstanding fixed rebound wall at the rear end of the board, a propulsion plunger in said collection recess engageable with the dice therein to propel same from the recess, means to move said block member rearwardly along the board to a position wherein said rake member is subjacent said fixed rebound wall, means actuating said propulsion plunger responsive to the movement of said block member to said position, whereby to propel the dice from said recess against said rebound wall, said actuating means including spring means biasing said plunger in a direction to propel the dice from the recess, means to return the block member to its normal position, means on the rake member engageable with the dice to move them forwardly toward said collection recess concurrently with the return of the block member to its normal position, and means to tension said spring means responsive to said return of the block member to its normal position.

4. A mechanical dice throwing apparatus comprising a board having a dice collection recess at its forward end adapted to contain dice, a block member movably mounted at one side of said board and being normally in a forward position adjacent the forward end of said board, rake

means secured to said block member and extending over the board, an upstanding fixed rebound wall at the rear end of the board, a propulsion plunger in said recess engageable with dice therein and directed to propel the dice rearwardly against said rebound wall, spring means acting on the plunger to urge same in a propulsion direction, movable catch means opposing said spring means, means to move the block member and rake means rearwardly to a rearward position subjacent the rebound wall, means releasing said catch means responsive to movement of said block member to said rearward position, means to return the block member to said forward position, and means to reset said catch means responsive to the return of said block member to said forward position.

5. A mechanical dice throwing apparatus comprising a board having a dice collection recess at its forward end adapted to contain dice, a block member movably mounted at one side of said board and being normally in a forward position adjacent the forward end of said board, rake means secured to said block member and extending over the board, an upstanding rebound wall at the rear end of the board, a propulsion plunger in said recess engageable with the dice therein and directed to propel the dice rearwardly against said rebound wall, spring means acting on the plunger to urge same in a propulsion direction, movable catch means opposing said spring means, a first electric motor, means driven by said first motor to move the block member and rake means rearwardly to a rearward position adjacent the rebound wall, means sequentially releasing said catch means and deenergizing said first motor responsive to movement of said block member to said rearward position, a second electric motor, means driven by said second electric motor to return the block member to said forward position, and means to sequentially reset said catch means and deenergize said second electric motor responsive to the return of said block member to said forward position.

6. A mechanical dice throwing apparatus comprising a board having a dice collection recess at its forward end adapted to contain dice, a block member slidably mounted at one side of the board and being normally in a forward position adjacent the forward end of the board, rake means secured to said block member and extending over the board, an upstanding rebound wall at the rear end of the board, a spring-urged propulsion plunger in said recess engageable with dice therein and directed to propel the dice rearwardly against said rebound board, releasable catch means normally restraining said plunger, a first electric motor, means driven by said first motor to move the block member and rake rearwardly to a rearward position adjacent the rebound wall, means sequentially releasing said catch means and opening the motor circuit responsive to movement of said block member to said rearward position, a second electric motor, means driven by said second electric motor to return the block member to said forward position, and means to sequentially reset said catch means and open the circuit of said second electric motor responsive to the return of said block member to said forward position.

7. A mechanical dice throwing apparatus comprising a board having a dice collection recess at its forward end adapted to contain dice, a block member slidably mounted at one side of the board and being normally in a forward position adjacent the forward end of the board, a rockable bar member extending along said one side underlying said block member and being rocked responsive to the movement of the block member along said one side, normally closed first and second switches operatively mounted adjacent and being engageable by opposite end portions of said bar member to open same, rake means secured to said block member and extending over the board, an upstanding rebound wall at the rear end of the board, a spring-urged propulsion plunger in said recess engageable with dice therein and directed to propel the dice rearwardly against said rebound wall, releasable catch means normally restraining said plunger, a first electric motor, said first motor having an energizing circuit including the first switch, means driven by said first motor to move the block member and rake means rearwardly to a rearward position adjacent the rebound wall, means releasing said catch means responsive to movement of said block member to said rearward position, said first switch being opened by said bar member when the block member reaches said rearward position, a second electric motor, said second motor having an energizing circuit including said second switch, means driven by said second electric motor to return the block member to said forward position, and means to reset said catch means responsive to the return of said block member to said forward position, said second switch being opened by said bar member when the block member reaches said forward position.

8. A mechanical dice throwing apparatus comprising a board having a dice collection recess at its forward end adapted to contain dice, a vertical block member slidably mounted at one side of the board and being normally in a forward position adjacent the forward end of the board, a rockable bar member extending along said one side underlying said block member and being rocked responsive to the movement of the block member along said one side, normally closed first and second switches operatively mounted adjacent and being engageable by opposite end portions of said bar member to open same, a transversely extending horizontal rake rod secured to said block member and extending over the board, said rake rod including at least one forwardly facing substantially V-shaped portion, an upstanding corrugated rebound wall at the rear end of the board, a spring-urged propulsion plunger in said recess engageable with dice therein and directed to propel the dice rearwardly against said rebound wall, releasable catch means normally restraining said plunger, a first electric motor, said first motor having an energizing circuit including the first switch, means driven by said first motor to move the block member and rake rod rearwardly to a rearward position adjacent the rebound wall, means releasing said catch means responsive to movement of said block member to said rearward position, said first switch being opened by said bar member when the block member reaches said rearward position, a second electric motor, said second motor having an energizing circuit including said second switch, means driven by said second electric motor to return the block member to said forward position, and means to reset said catch means responsive to the return of said block member to said forward position, said second switch being opened by said bar member when the block member reaches said forward position.

9. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion thereof and fixed upstanding rebound means opposite said collection area, dice propulsion means in said collection area to propel dice against said rebound means, rake means movable over the board, means to move said rake means to a position subjacent said rebound means, and means to actuate said dice propulsion means responsive to the arrival of said rake means at said position.

10. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion thereof and upstanding fixed rebound means opposite said dice collection area, dice propulsion means in said collection area to propel dice against said rebound means, rake means movable over the board, means to move said rake means to a position subjacent said rebound means, means to actuate said dice propulsion means responsive to the arrival of said rake means at said position, means to return said rake means to a position adjacent said collection area, and means to prepare said dice propulsion means for further actuation responsive to the return of said rake means to said last-named position.

11. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion

thereof and fixed upstanding rebound means opposite said collection area, spring-operated dice propulsion means in said collection area to propel dice against said rebound means, releasable catch means restraining operation of said propulsion means, rake means movable over the board, means to move said rake means to a position subjacent said rebound means, and means to release said catch means responsive to the arrival of said rake means at said position.

12. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion thereof and fixed upstanding rebound means opposite said dice collection area, spring-operated dice propulsion means in said collection area to propel dice against said rebound means, releasable catch means restraining operation of said propulsion means, rake means movable over the board, means to move said rake means to a position subjacent said rebound means, means to release said catch means responsive to the arrival of said rake means at said position, means to return said rake means to a position adjacent said collection area, and means to reset said catch means to restraining relationship with respect to said dice propulsion means responsive to the return of said dice means to said last-named position.

13. A mechanical dive throwing apparatus comprising a board including a dice collection area at one portion thereof and fixed upstanding rebound means at an opposite portion thereof, dice propulsion means in said collection area to propel dice outwardly from said area toward said rebound means, rake means movable over the board, means to move said rake means to a predetermined position spaced from said area, means to actuate said dice propulsion means responsive to the arrival of said rake means at said predetermined position, means to return said rake means to a position adjacent said collection area, and means to prepare said dice propulsion means for further actuation responsive to the return of said rake means to said last-named position.

14. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion

thereof and fixed upstanding rebound means at an opposite portion thereof, spring-operated dice propulsion means in said collection area to propel dice outwardly from said area toward said rebound means, a releasable catch means restraining operation of said propulsion means, rake means movable over the board, means to move said rake means to a predetermined position spaced from said area, and means to release said catch means responsive to the arrival of said rake means at said predetermined position.

15. A mechanical dice throwing apparatus comprising a board including a dice collection area at one portion thereof and fixed upstanding rebound means at an opposite portion thereof, spring-operated dice propulsion means in said collection area to propel dice outwardly from said area toward said rebound means, releasable catch means restraining operation of said propulsion means, rake means movable over the board, means to move said rake means to a predetermined position spaced from said area, means to release said catch means responsive to the arrival of said rake means at said predetermined position, means to return said rake means to a position adjacent said collection area, and means to reset said catch means to restraining relationship with respect to said dice propulsion means responsive to the return of said rake means to said last-named position.

References Cited by the Examiner

UNITED STATES PATENTS

1,942,932	1/34	Nicholas	273—145
1,968,885	8/34	Ginsberg	273—145
2,378,722	6/45	Nicholas	273—145

FOREIGN PATENTS

124,095	3/31	Germany.

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