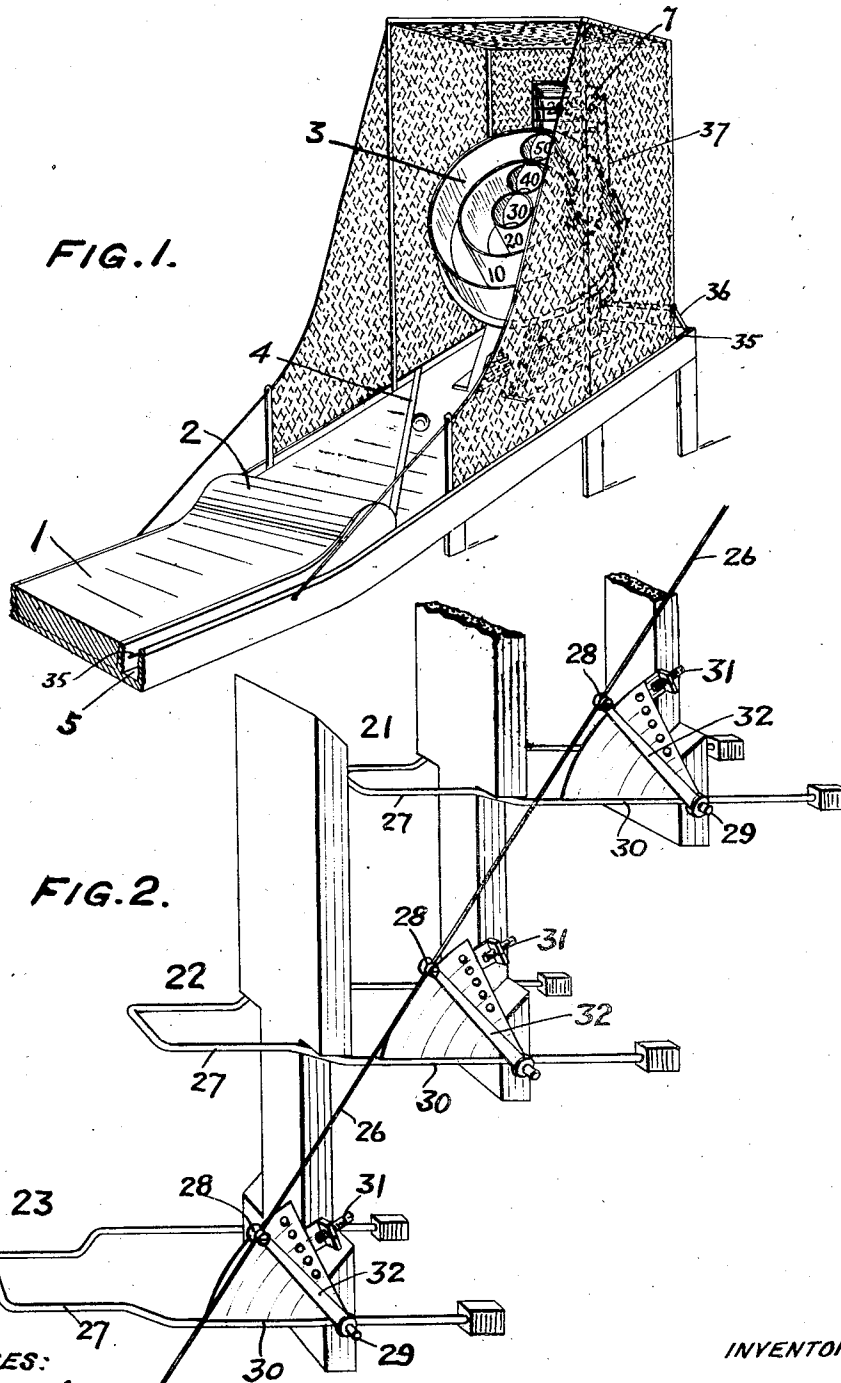


J. M. DOEBRICH.
 SCORING MECHANISM FOR GAME APPARATUS.
 APPLICATION FILED OCT. 22, 1914.

1,185,071.

Patented May 30, 1916.

5 SHEETS—SHEET 1.



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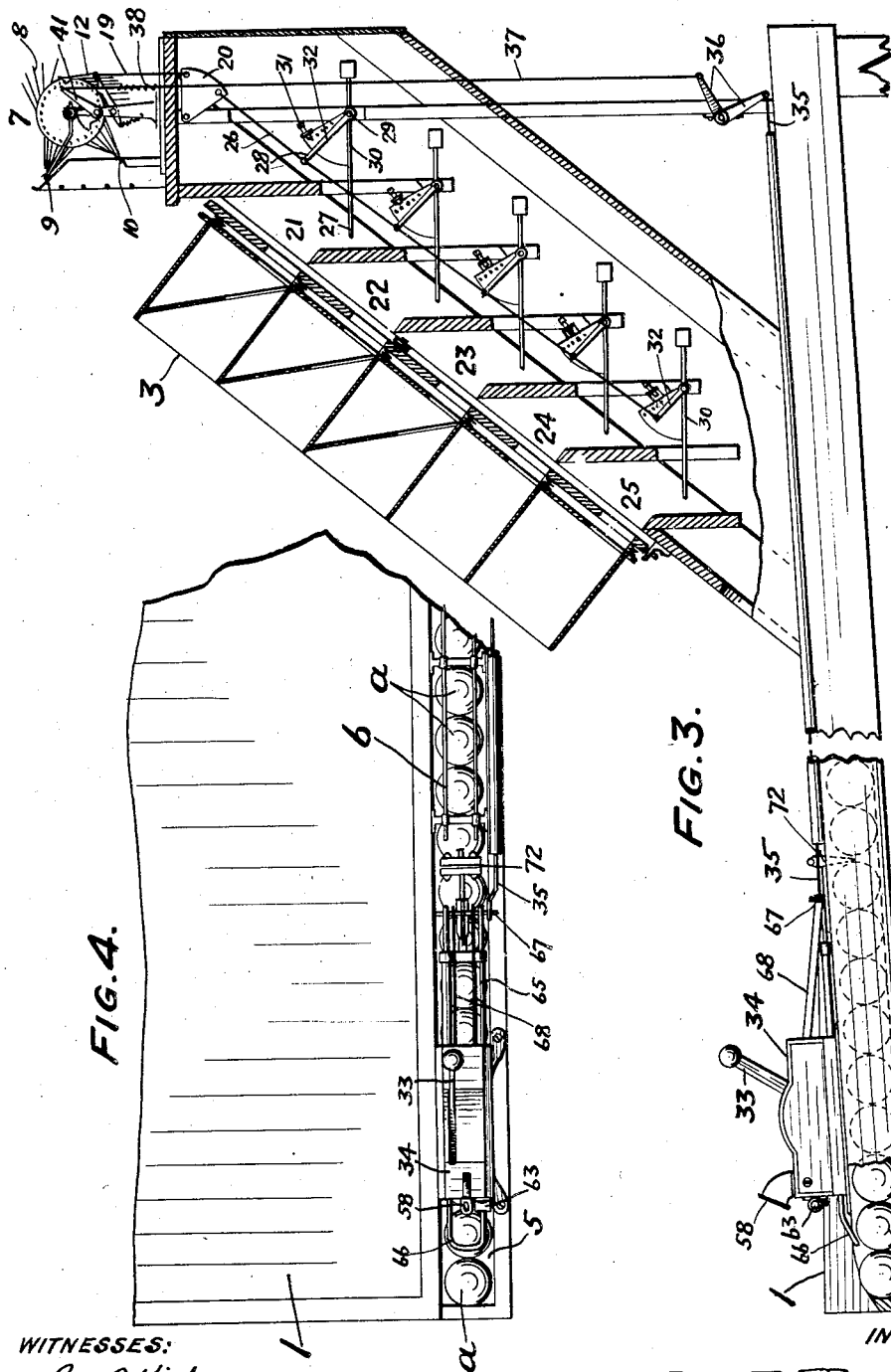


FIG. 4.

FIG. 3.

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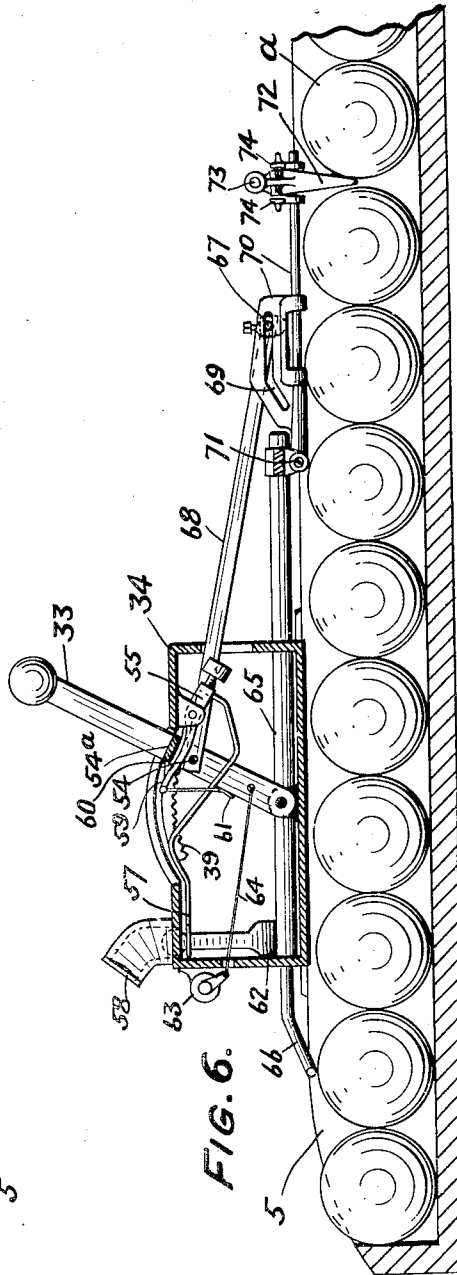
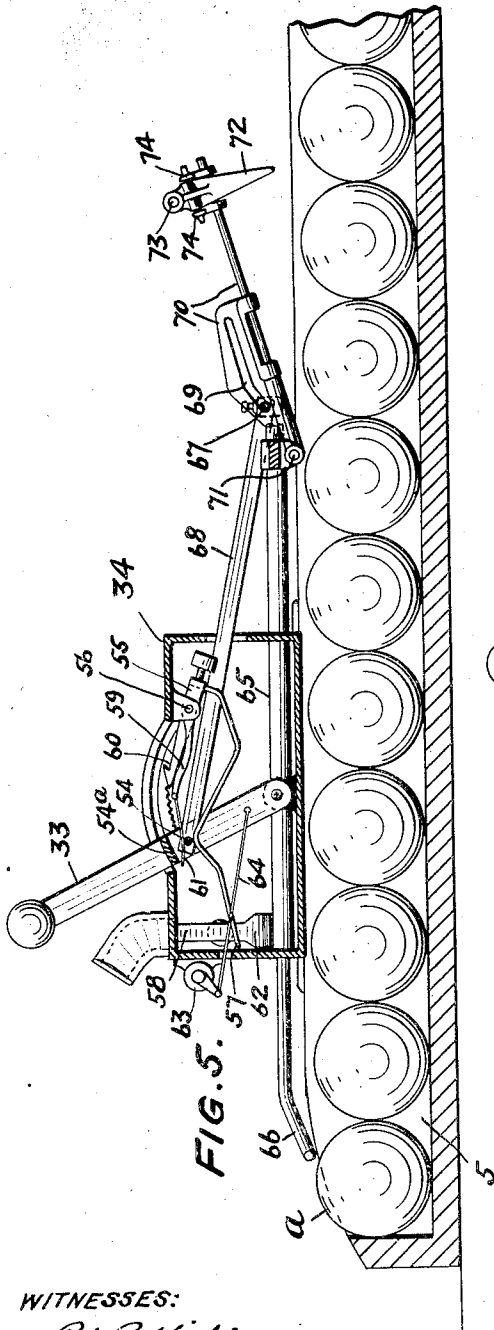
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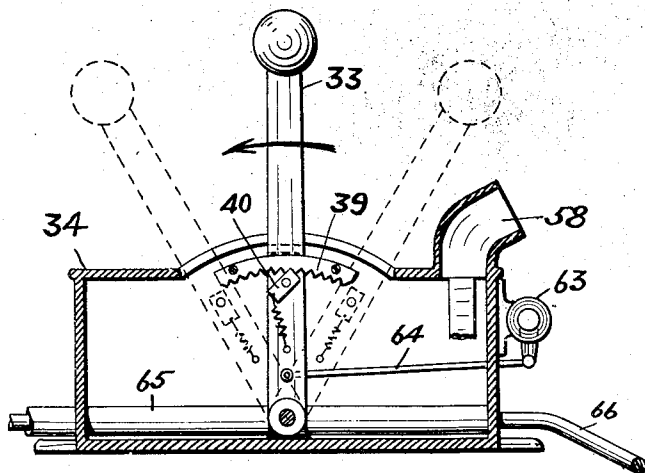


FIG. 7.

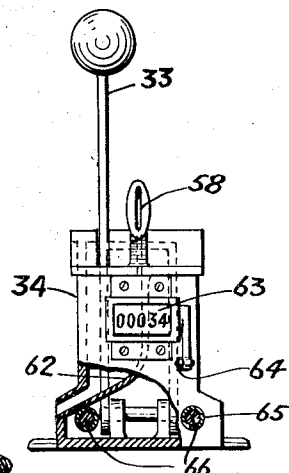


FIG. 8.

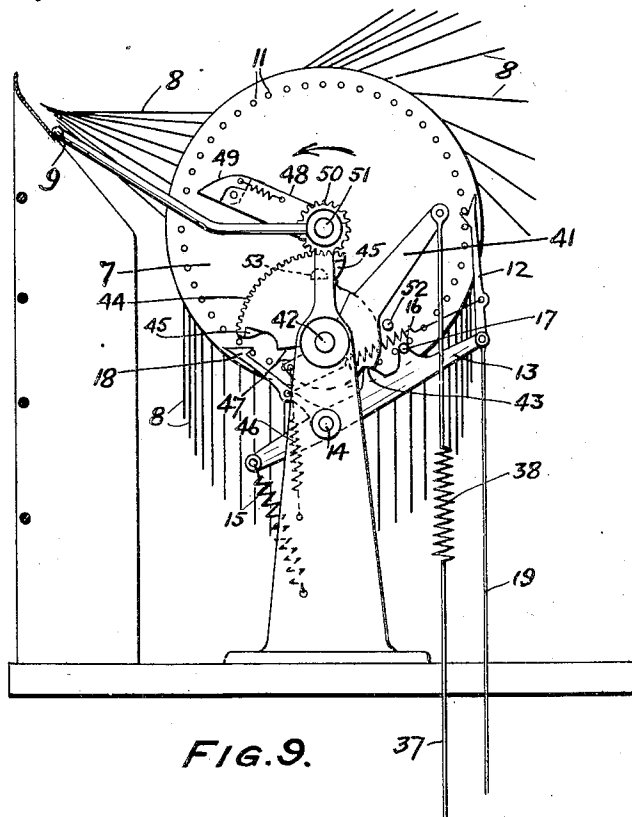


FIG. 9.

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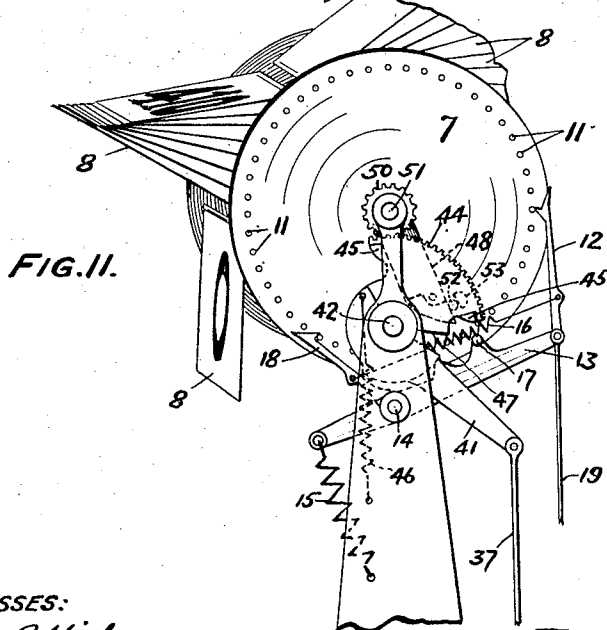
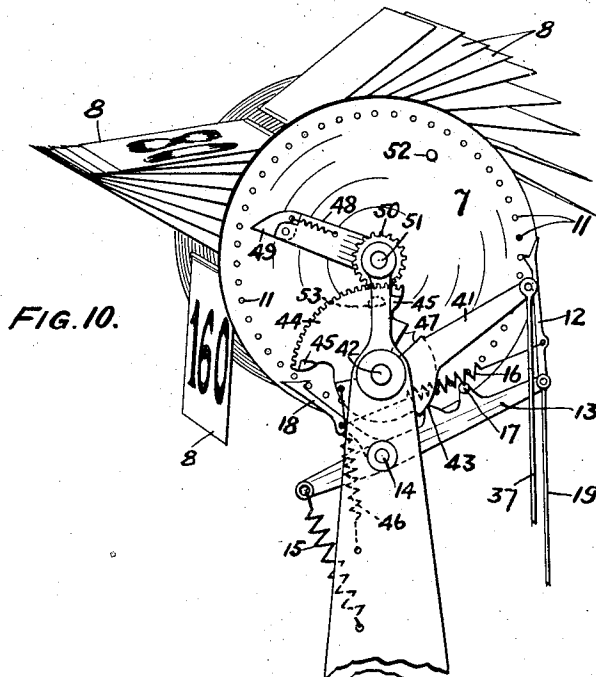
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5 SHEETS—SHEET 5.

1,185,071.



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UNITED STATES PATENT OFFICE.

JOSEPH M. DOEBRICH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE J. D. ESTE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

SCORING MECHANISM FOR GAME APPARATUS.

1,185,071.

Specification of Letters Patent.

Patented May 30, 1916.

Application filed October 22, 1914. Serial No. 867,965.

To all whom it may concern:

Be it known that I, JOSEPH M. DOEBRICH, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Scoring Mechanism for Game Apparatus, of which the following is a specification.

The present invention is applicable in whole or in part to the game apparatus shown and described in Letters Patent No. 905,941 of December 8th, 1908, to F. J. Simpson, although its application is not limited to that particular apparatus. However, in the following description reference will be made to that apparatus for the sake of an explanation of the invention.

The principal object of the present invention is to provide for automatically keeping the score attributable to the balls played by the players; to provide for resetting the scoring apparatus; to provide for automatically delivering to each player the appropriate number of balls for a game; to provide for requiring prepayment of the price charged for a game before the balls are delivered and the scoring mechanism reset, and further to provide in the particulars mentioned, or some of them, for making the operation of the apparatus automatic and independent of the services of an attendant.

Other objects of the invention will appear from the following description and the invention itself will be claimed at the end hereof.

The accompanying drawings illustrate an embodiment of the invention, chosen from other embodiments, and in them—

Figure 1, is a perspective view with parts broken away of a game apparatus such as is shown and described in said Letters Patent No. 905,941, fitted with mechanism embodying features of the invention. Fig. 2, is a perspective view, drawn to an enlarged scale, illustrating details of construction. Fig. 3, is a side view, partly in section with parts broken away, illustrating the game apparatus of Fig. 1 and also mechanism embodying features of the invention. Fig. 4, is a top or plan view of the apparatus illustrated at the left-hand side of Fig. 3. Figs. 5 and 6 are sectional views, drawn to an enlarged scale, and illustrating more or less

in elevation the apparatus shown in Fig. 4. Fig. 7 is a sectional view of some of the apparatus shown in Figs. 5 and 6, but looking in the other direction. Fig. 8, is an end view of Fig. 7. Fig. 9, is a side view partly in section of apparatus shown at the right-hand side in Fig. 3, and Figs. 10 and 11 are views, partly in perspective illustrating the apparatus shown in Fig. 9 in different positions.

For the sake of a description of the invention the operation of the game apparatus to which it is shown as applied may be briefly explained.

1 is an alley having interposed in it a hump 2 and provided with an elevated target 3 consisting of ring-like cavities. The alley is provided with a wall 4 communicating with a ball return runway 5 covered by a grating or the like 6, Fig. 4. In playing the game each player uses an appropriate number of balls *a*, for example, nine. The player rolls these balls along the alley 1, one after another, each ball striking the hump 2 rises and it is the intention that it shall strike the target as near the bulls eye as possible, at any rate if it strikes the target it counts for the player according to the place where it strikes. The balls pass through the target in a manner which will be described and are returned to the alley at its far end and are directed by the guide 4 to the runway 5 which returns the balls to the playing end of the alley.

There is a rotary scoring member 7 suitably arranged in respect to the alley, for example, above the target 3. This rotary scoring member consists generally speaking of a squirrel-cage having pivoted between its ends cards 8, bearing appropriate numbers and by dropping from a fixed rest 9, as the squirrel cage is rotated, adapted to show the marking or number on a single card at a time through a suitable opening. Upon one end of the squirrel cage there is a circular series of pins 11 corresponding in number with the number of the cards and these pins may be designated ratchet pins.

12, is a pawl arm pivotally mounted on a locking lever 13 pivoted intermediate of its ends at 14 and operated upon by the spring 15. This pawl lever 12 is held up to its work by the spring 16. The locking lever 13 is provided with a projection 17 adapted

to take in between adjacent teeth 11 and so prevent accidental or unintended rotation of the member 7.

18 is a spring detent that prevents retrograde—in the present instance clock-wise—turning of the member 7.

The locking lever 13 and the pawl arm 12 are connected by a wire or link 19 to one arm of a bell crank 20. If the link or wire 19 be pulled for a certain distance and then released, the pawl arm 12 will pass by a certain number of teeth or pins 11 and will thereafter turn the member 7 in a counter-clockwise direction through a movement corresponding to the number of pins. There are a set of bell crank levers, of which one arm of each lever is in a ball path 21, 22, 23, 24, and 25, and the other arm of each bell crank lever is connected with a rod or wire 26 attached to the bell crank 20. Each of these bell crank levers has the operative ends 27 and 28 in appropriate arcs struck from the pivotal support 29 of the bell crank lever and in appropriate angular relation for effecting an appropriate throw of the pawl arm 12 for showing the card 9 which should be shown having regard to the ball path or way through which the ball passed. The arms of the bell crank levers are independently pivoted at 29 and the arm 30 is provided with a counter-weight and with an adjusting screw 31 adapted to collide with the arm 32. As shown the arms 32 are of different lengths and the set screws 31 can be adjusted to vary the point in the angular motion of the arm 30 at which its motion is communicated to the arm 32.

Assuming that the scoring device is showing zero and that a ball traverses the path 21, it will strike the end 27 of the arm 30 and turn it through a certain range of motion. This is true of any ball passing through any of the ball paths. However, returning to the ball which is passing through the ball-way 21 and should in the present instance count fifty, the movement of the arm 27 is transmitted by the relatively long arm 32 to the rod 26 and the motion begins at an earlier or later time in the movement of the arm 27 by the adjustment of the set screw 31. The effect of this long arm 32 is to move the pawl arm 12 over five pins on the rotary scoring member 7 so that when the ball passes and the mechanism is released the pawl arm 12 drives the member 7 a sufficient distance to throw down the card 8, which shows fifty.

A description of one of the other bell crank levers will be sufficient, so that the one that coöperates with the ball path 25 will be given. In this case the arm 30 travels the same distance as before, but the arm 32 is relatively short. The ball-way 25 is for the passage of a ball that should score

ten. In consequence of this short arm the arm 12 is only moved a distance of one pin 11 on the member 7 so that when the mechanism is released by the passage of the ball the member 7 is advanced only far enough to show one card, which is the next one and therefore the true score of sixty is indicated. It is not necessary that the angular position at which the arms 30 and 32 become operative be adjusted in connection with the length of the arms for these are but different ways of attaining the same end and they can be used alone or in combination.

We may assume now that a player has played a game and that one of the cards 8 indicates his total score. The next operation in logical order is for another player to play a game and to do this he should be provided with an appropriate number of balls, the scoring mechanism should be reset to zero, and it is often desirable that he should be required to pay in advance.

33 is a hand lever which may be pivoted in a suitable housing 34 having a slot to permit of the lever being drawn back and forth. This hand lever 33 operates resetting mechanism to be presently described, through the intervention of a rod 35 extending along the alley, a bell crank 36 and a connection 37 which may be included in it and a spring 38. This hand lever 33 should therefore, and for reasons which will hereinafter appear, be operated through full strokes backward or forward and should not be free to be operated through partial strokes or for example, pulled part way forward and then pushed back. One side of the housing 34, the side which is removed in Fig. 7 for the sake of clearness, is provided with a curved rack 39 in connection with which a two-way detent 40 on the hand lever 33 operates. At each end of the stroke of the hand lever 33 the detent runs off the rack, but when the hand lever 33 is once started in either direction it cannot be returned until it has made a full stroke. From Fig. 7 it is evident that the hand lever 33 can be moved in the direction of the arrow to complete its stroke, but cannot be moved in the opposite direction until it has completed its stroke.

The resetting mechanism which is operated from the rod 37 will be described in connection with Figs. 9 to 11. 41, is a resetting lever pivoted at 42 and between this lever 41 and the locking lever 13 there are cams 43 so that when the lever 41 is turned it releases the rotary score member 7 by withdrawing the projection 17 from between two of its teeth 11. 44, is a toothed quadrant pivoted at 42 and provided with stops 45 for limiting its range of motion. The resetting lever 41 is retracted by means of a spring 46 and between the resetting lever 41 and the quadrant 44 there are abut-

ting faces 47 of which the angular relation is such that there is some lost motion between the parts, although the resetting lever 41 turns the quadrant in one direction or the other. 48 is a resetting finger provided with an end 49 which may yield in one direction and not in the other. This resetting finger is fast with a pinion 50 journaled at 51 and meshing with the quadrant so that the quadrant turns the finger. On the end of the rotary scoring member there is a stop pin 52 adapted to collide with a stop pin 53 on the back of the quadrant when the latter is in the position shown in Fig. 11, but arranged to clear the stop pin 53 when in other positions. When the stops 52 and 53 are in contact with each other as shown in Fig. 11, the member 7 is locked by the detent 18 and the zero card is exposed. The relation between the number of teeth on the quadrant and on the pinion is such that one stroke of the quadrant causes the pinion to turn through a little more than 360° , so that the finger 48 is turned more than 360° . The purpose of this is to insure the return of the scoring apparatus to zero and the purpose of the yielding end 49 is to permit the finger to pass the pin 52 whenever it may be necessary. If we assume that the scoring mechanism indicated 160, as shown in Fig. 10, and that the hand lever 33 is pulled through a full stroke, the finger 48 is turned counter-clockwise through 440° and is arrested in the position shown in Fig. 11 with the stops 52 and 53 in abutment and with zero indicated. When the hand lever 33 is pushed toward the right in Fig. 7, the rotary scoring member 7 is held by the detent 18 and the quadrant and resetting finger 45 are returned to place, the yielding end of the finger 49 permitting it to pass the pin 52 when the finger is turning clockwise and the locking pin 17 also locks the member 7.

A description will now be given of the coin released mechanism for the hand lever 33. The part of the hand lever 33 within the housing 34 is forked, one fork being omitted in Figs. 5 and 6. Between the forks there is a pin 54 and a cross piece 54^a.

55 is a counter-balanced coin lever pivoted at 56 to a bracket on the inner face of the top of the housing 34. At its forward end this lever 55 is provided with a laterally open hook 57 to which a coin is guided by the coin chute 58. If the coin be of appropriate size and weight, it tips the coin lever but this tipping movement is temporarily arrested because the guide arm 59 integral with the coin lever rests upon the pin 54. By the tipping of the lever the hook 60 integral with the coin lever is dropped clear of the cross piece 54^a. If the guide arm 59 did not rest upon the pin 54, the coin lever would turn, become free of its coin and per-

haps return again, causing the hook 60 to engage the part 54^a before the hand lever 33 was pulled. The finger 61 pivotally connected to the guide arm 59 is a leader which keeps the guide arm above the pin 54. Hand lever 33 after the coin has been freed from the hook 57 by the inclined delivery chute 62 is returned.

63, is a counter visible from the outside of the box or casing 34 and it is connected as by a link 64 with the lever 33 so that for each operation of the lever the counter is advanced, thus indicating the number of games that have been played and checking up the coin receipts.

65, is a fixed frame in which is mounted for reciprocation a movable frame, the forward end 66 of which constitutes a ball guard and the rear end of which is provided with a cross-pin 67 that is connected by suitable links 68 with the hand lever 33. The cross-pin 67 also works in a cam slot 69 formed in a gate arm 70 pivoted to the fixed frame at 71. The gate arm 70 carries a gate 72 pivoted at 73 and allowed a slight range of motion between the stops 74.

As has been said the normal position of the handle 33 is shown in Fig. 6, but at the beginning of a game there are no balls in front, that is toward the left of the gate 72. When the hand lever 33 is pulled into the position shown in Fig. 5, the gate is raised and balls, in the present instance, nine, roll past it but the guard end 66 of the frame overlies the balls as shown in Fig. 5 so that none of them can be taken out and played with. When the hand lever 33 is pushed back into the position shown in Fig. 6, the gate 72 descends and cuts off nine balls, at the same time the guard 66 is retracted and permits the player to remove the balls one at a time as is shown in Fig. 6.

The operation may be described as follows: Starting with the parts in the position shown in Fig. 6, but without the balls in front of the gate, the score cards 8 indicate the score of the last player. The new player puts his coin in the coin chute 58, the coin by its weight turns the coin lever to an extent limited by the guide arm 59 sufficient to release the hook 60 from the cross-member 54^a but not sufficient to permit the inclined chute 62 to free the coin from the hooked end 57. The player then pulls the lever forward and he is compelled to pull it through a full stroke by the pawl 40 and rack 39. The full stroke of the lever lifts the gate 72 and brings the guard 66 forward so that balls descend but may not be taken out because the guard 66 covers them as shown in Fig. 5. In order to get the balls out, the player must push the hand lever 33 backward. This backward motion causes the gate 72 to cut off the allowance of nine balls and to retract the guard 66

so that the player can get the balls. During the forward and back stroke of the hand lever 33, the score is reset to zero through the connections 35, 36, 37, and the described
5 resetting mechanism which is shown in Figs. 9 to 11. The player then bowls the balls and his score is kept by the mechanism which has been described and which is shown in Figs. 2, 9 and 11. The above operation is repeated by the successive players
10 and finally the counter 63, Fig. 8 indicates the total number of games that have been played and should correspond with the number of coins. It is evident that when all
15 the described features are employed the game is managed without requiring the services of an attendant, but of course some of the features may be omitted while others are retained.
20 It will be obvious to those skilled in the art that modifications may be made in de-

tails of construction and arrangement, hence the invention is not limited in regard to such matters nor in any way further than the prior state of the art may require. 25

What I claim is:

In a game apparatus the combination of a plurality of ball paths, ball operated scoring mechanism responsive in different degree to balls traversing different paths and
30 provided with re-setting means, return ball dispensing means, a hand lever, and connections between the hand lever and ball dispensing and re-setting means for re-setting the scoring mechanism and releasing a
35 supply of balls, substantially as described.

In testimony whereof I have hereunto signed my name.

JOSEPH M. DOEBRICH.

In the presence of—

CLIFFORD K. CASSEL,

FRANK E. FUNCH.