July 8, 1941. C. WEBER 2,248,316

BOWLING GAME

Filed Dec. 18, 1937 4 Sheets-Sheet 1

Fig. 1

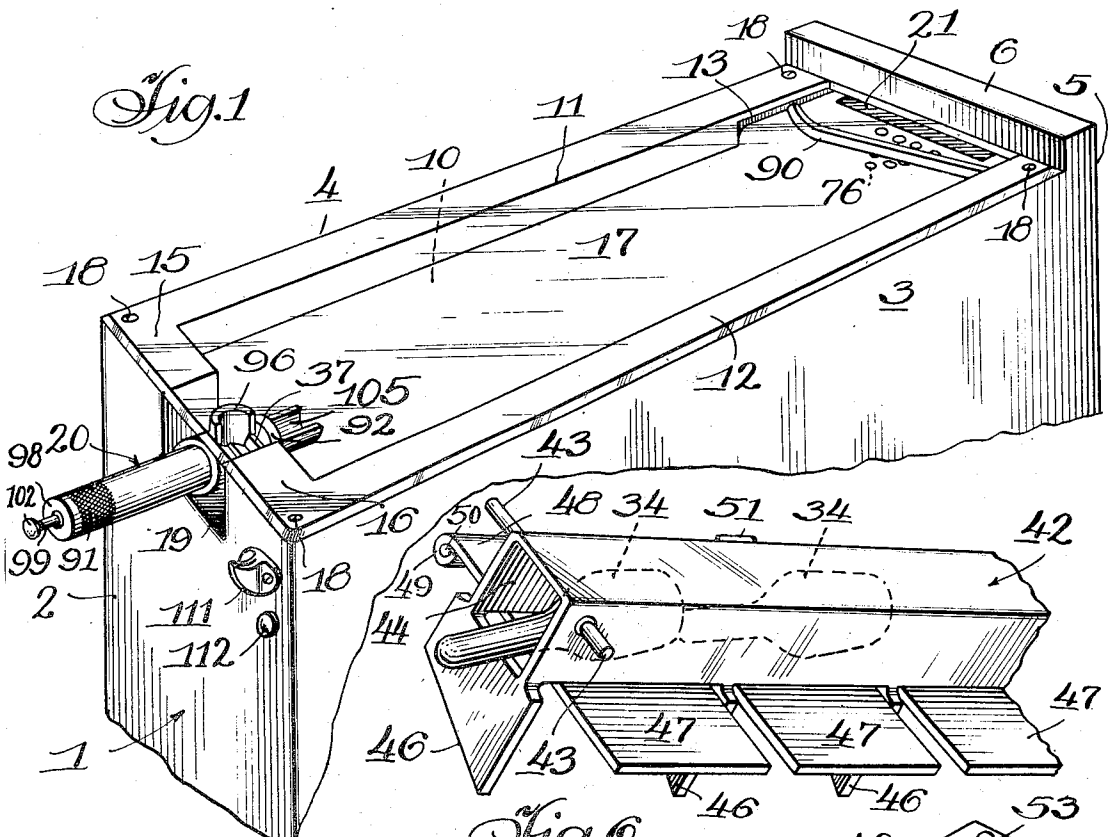


Fig. 6

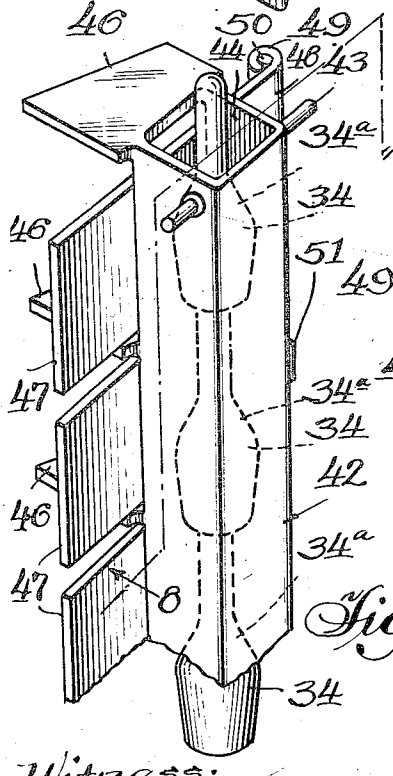


Fig. 5

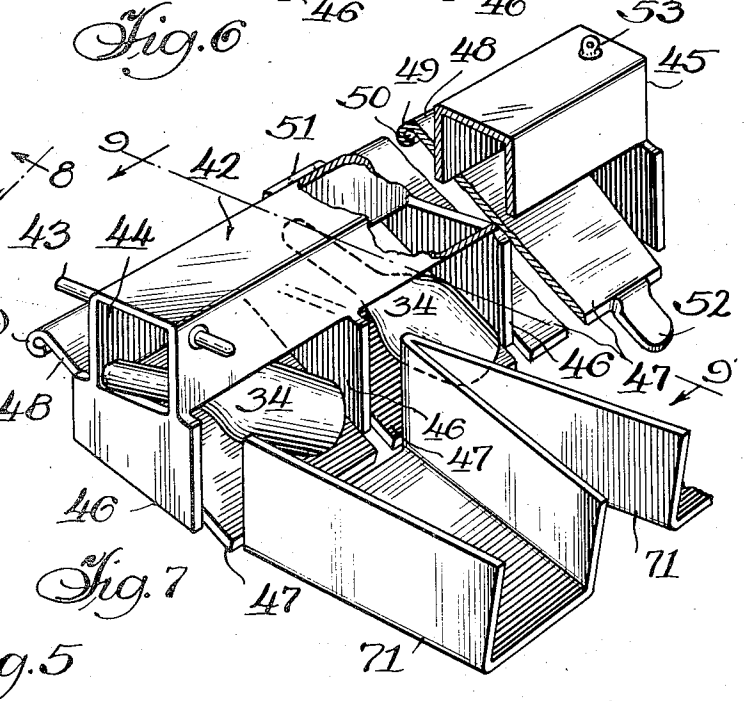


Fig. 7

Witness:
Chas. L. Hourah.

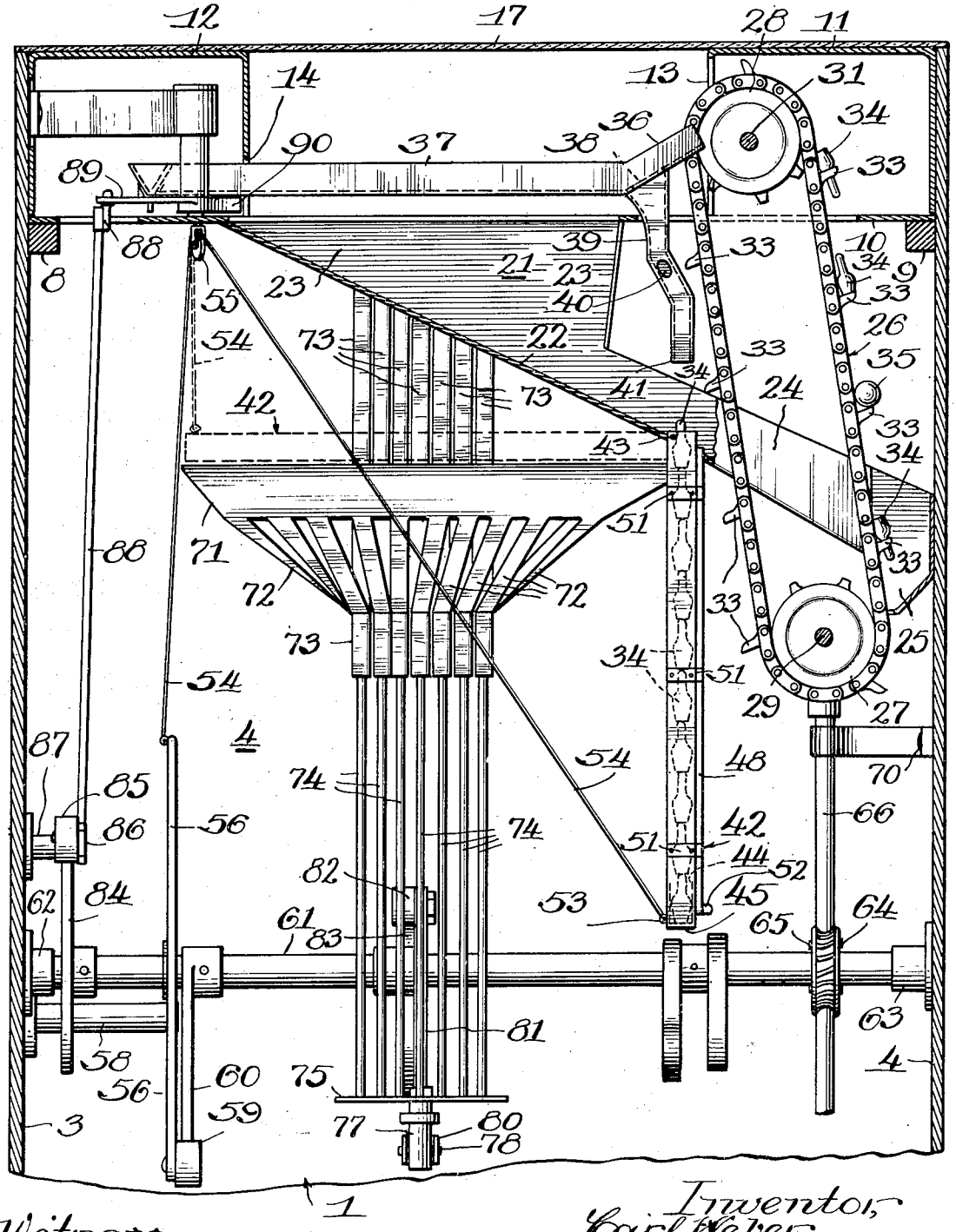
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BOWLING GAME

Filed Dec. 18, 1937 4 Sheets-Sheet 2

Fig. 2.



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BOWLING GAME

Filed Dec. 18, 1937 4 Sheets-Sheet 3

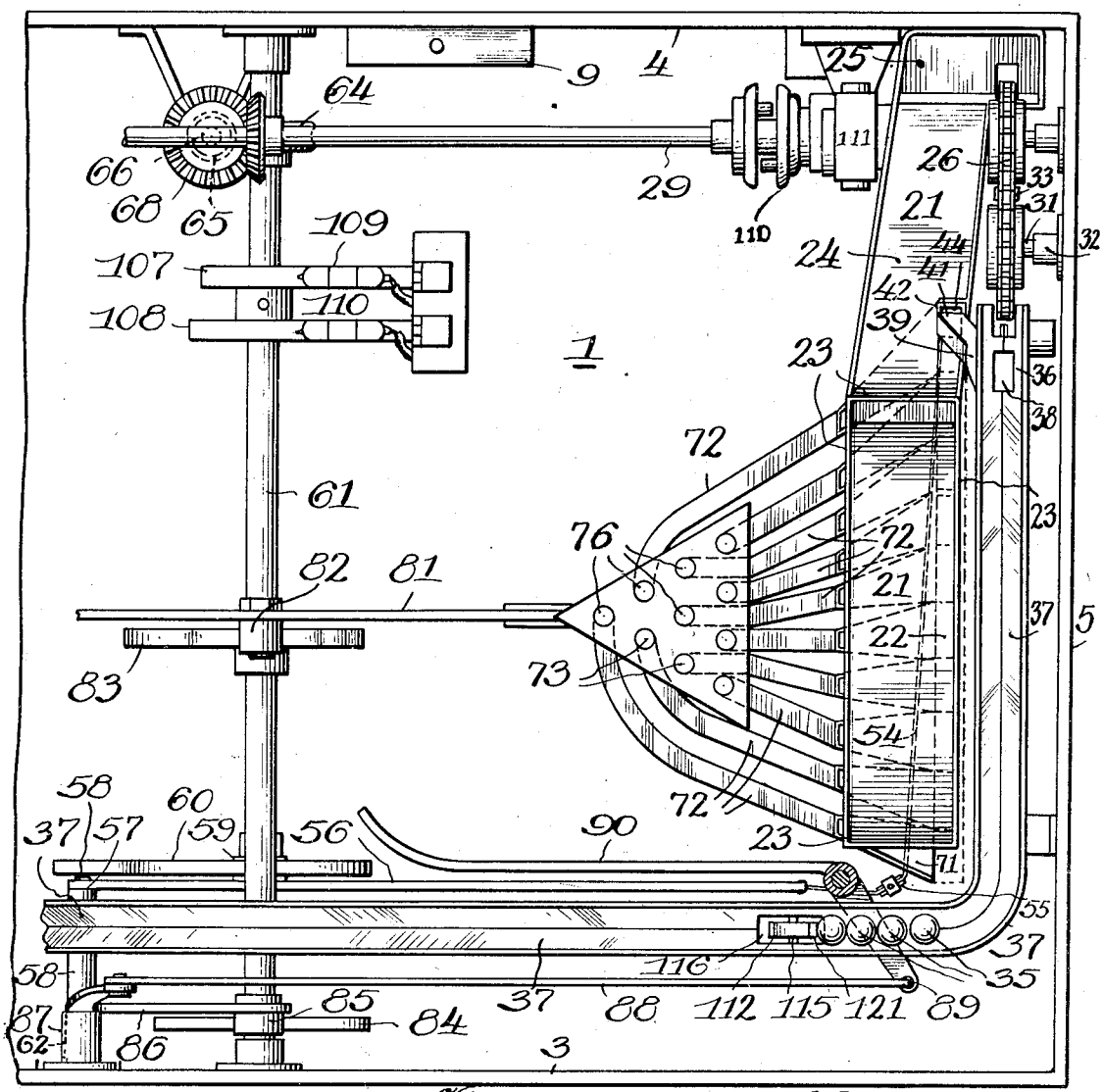


Fig. 3

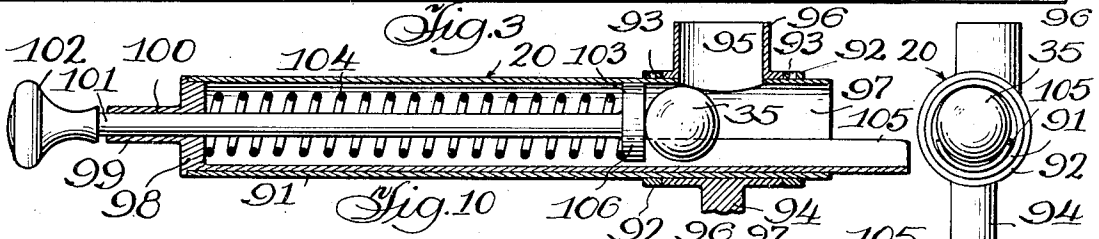


Fig. 10

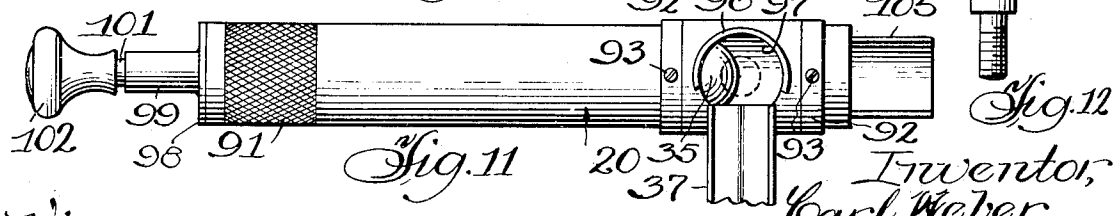


Fig. 11

Fig. 12

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BOWLING GAME

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Fig. 13

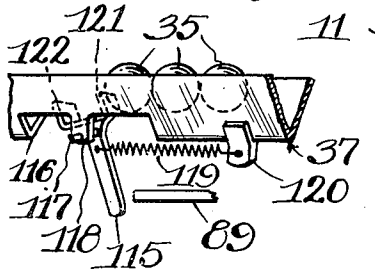


Fig. 4

Fig. 8

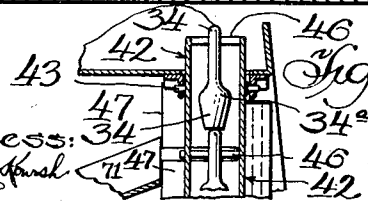
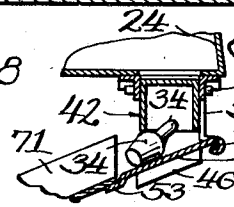


Fig. 9



Witness:
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Patented July 8, 1941 2,248,316

UNITED STATES PATENT OFFICE

2,248,316

BOWLING GAME

Carl Weber, Chicago, Ill., assignor of one-third to William Kings and one-third to Alfons Bacon, both of Chicago, Ill.

Application December 18, 1937, Serial No. 180,483

5 Claims. (Cl. 273—38)

My invention relates to bowling games and more particularly to an automatic, coin operated game in which a marble or the like is used for the ball. The game is preferably adapted to occupy a relatively small space so that it may be placed in hotel lobbies, drug stores, places of amusement and the like but may also be used in the home, at clubs, etc. where the coin mechanism would not be desired and could be replaced by a push button or the like.

An object of my invention is to provide a game which is substantially completely automatic except for the aiming and projecting or propelling of the ball which is done by a novel movable spring operated plunger. The clearing of the deadwood or fallen pins and the resetting of the pins is electrically operated. This may be initiated by either a push button or a coin actuated mechanism but preferably by a combination of the two. With a coin operated game the coin would put the game in operative condition but, after the ball was propelled at the pins, a push button would operate the device to remove the upset pins, and return the ball for the second shot or throw, the standing pins remaining on the alley.

Another object is to provide an operating mechanism for resetting the pins, returning the ball, etc., that will occupy a relatively small place and have a minimum number of moving parts. Another object is to provide a novel device in which a new set of pins is placed upon the alley almost immediately after one set has been removed therefrom so that the next player will not have long to wait for his turn.

Most table games which one encounters in public places are largely dependent on luck and the element of skill plays very little part. With my game, however, the more skillful player should usually win. Another object, therefore, is to provide a table game which is more responsive to the skill of the player than the games of this kind now on the market.

Another object is to provide a table game which is played exactly the same as the usual game played on a regulation bowling alley. The player projects or propels the ball to knock down the pins, then presses a button which removes both the standing pins and the fallen pins or deadwood from the alley. The standing pins are then returned to their position on the alley and the player has another turn to knock down these pins. "Strikes" and "spares" are, of course, possible, and the game is scored exactly the same as the regulation game.

Another object is to provide a ball propelling device whereby spin or "english" may be put on the ball to make it travel in a slight arc or curve toward the pins.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

The invention further resides in the construction, combination and arrangements of parts illustrated in the accompanying drawings, and while I have shown therein a preferred embodiment it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions without departing from the spirit of the invention.

In the drawings:

Fig. 1 is a fragmentary perspective view of my game.

Fig. 2 is a fragmentary view thereof in rear or end elevation with the rear wall removed.

Fig. 3 is a fragmentary plan view of the rear of the game with parts removed to more fully disclose certain details of construction.

Fig. 4 is a fragmentary view in side elevation of the rear of the game with parts removed.

Fig. 5 is a fragmentary view in perspective of the pin loading chamber.

Fig. 6 is a fragmentary perspective view of the structure shown in Fig. 5 when moved into an elevated position.

Fig. 7 is another fragmentary perspective view of the magazine or loading chamber and associated parts showing the parts just after the trap doors are opened to discharge the pins.

Fig. 8 is a fragmentary view in vertical cross section of the pin loading chamber and associated parts, taken on the line 8—8 of Fig. 5.

Fig. 9 is another fragmentary view in vertical cross section of the pin loading chamber and associated parts when moved into an elevated position for discharging the pins, taken on the line 9—9 of Fig. 7.

Fig. 10 is a vertical sectional view of the ball propelling mechanism.

Fig. 11 is a top plan view of the ball propelling mechanism.

Fig. 12 is an end view of the ball propelling mechanism with the ball in position.

Fig. 13 is a fragmentary perspective view of the ball retaining mechanism in the runway.

In the embodiment of my invention shown in

the drawings, 1 represents the cabinet housing my game. This cabinet is provided with front 2, sides 3 and 4 and rear 5 preferably of wood, composition or metal. The rear 5 extends above the other sides and has mounted thereon an inverted U-shaped member 6, the front leg of which rests on the top of the sides 3 and 4 (see Fig. 4). Near the top of the sides 3 and 4 are brace members or supports 8 and 9 for the floor 10 of the alley. On each side of this floor are located inverted U-shaped members 11 and 12 for housing some of the mechanism later described. These members are provided with cut-out portions 13 and 14 for a purpose hereinafter explained. Similar members 15 and 16 are in the front part of the floor. The parts 11 and 15, and 12 and 16 may be of one piece if desired. On top of these members and on the sides and front of the cabinet may be placed a glass top or other transparency 17 secured to the members by screws 18 or the like. In the top center portion of the front 2 is provided a cut-out or channel 19 in which is located the ball propelling mechanism indicated generally by the reference character 20. At the rear of the floor 10 is pit 21 for receiving the ball and knocked over pins hereinafter referred to as deadwood. The pit has sides 23 extending from the alley 10 to the floor 22. The pit has a chute portion 24 extending beyond a side 23 and ending in well or hopper 25, one wall of which is formed by a movable conveyor belt chain 26, rotatable on sprocket wheels 27 and 28, driven by motor shaft 29. Shaft 29 is journalled at one end in bearing 30 secured to rear wall 5 of the cabinet and is driven by motor or other power source (not shown) in the front part of the cabinet. Sprocket 28 is mounted on stub shaft 31 freely rotatable in bearing 32 on the rear wall 5 of the cabinet.

On chain 26 are a plurality of bifurcated projections 33 adapted to receive and engage the pins 34 or balls 35 in the bottom of well 25 and carry them over sprocket wheel 28 where they are dumped into chute 36 connecting with runway 37 which is inclined slightly and leads to the front of the cabinet under members 6, 12 and 16 to the ball propelling mechanism 20.

The balls follow this runway. The pins, however, drop through opening 38 in the chute to tube or hopper 39. This tube has two bends therein (see Fig. 4) and the bottom of the bent portion is provided with slot 40 so that the pins will leave the end 41 of the tube in upright position. This slot is a little wider than the heads of the pins but not as wide as the base. When the pins come down this tube in upright position, or base first, they continue on that way. When they come down head first, however, the head will enter the slot until the shoulder 34a of the pin contacts the sides of the tube around the slot. The base will then tilt over until it is inclined downwardly enough to pull out the head because of its greater weight and the pin then continues downward in the desired upright position. The pins are dropped from the tube 39 into a magazine or loading chamber 42 directly therebelow. This chamber projects through and extends slightly above the sloping floor 22 of the chute portion 24 of the pit and is fulcrumed or pivotally connected thereto by pins 43 or the like mounted in suitable openings (not shown) in or beneath the floor.

This magazine is more fully shown in Figs. 5 to 9. It is an elongated chamber or member provided with opening 44 closed at the bottom 45. On one side it is provided with a plurality of depending members or plates 46 extending some distance away from or below the chamber and slightly beyond adjoining sides. These members may be integral with the side from which they project as shown in Figs. 5, 6 and 7 or may be made separate and suitably attached thereto. The tops of these members form part of one side of the chamber. The remaining portion of that side comprises individual trap doors 47 hingedly mounted at a point spaced from the chamber and in a manner to contact edges of opposite sides of the chamber. The rearward extension 48 is formed with a bead 49 adapted to receive rod or pin 50 of the stationary hinge member or bracket 51 suitably mounted on chamber 42. The rod or pin 50 is rigidly secured in bead 49 whereby movement or tripping of a door will cause the rod to rotate and it in turn carry all the doors to an open position. To accomplish this purpose, the lowermost door 47 is provided with tab 52 adapted to be tripped in a manner later described.

The chamber 42 is provided near its lower end with eye 53 to which is connected one end of wire or rope 54 passing through pulley 55 mounted on the underside of floor 10. The wire 54 is connected at its other end to one end of arcuate arm 56 swingably or pivotally mounted at 57 to a stub shaft 58 on the side of the cabinet. This arm is also provided with following roller 59 bearing the face of cam 60 rotatable by shaft 61 mounted between the sides 3 and 4 of the cabinet in bearings 62 and 63. This shaft 61 is rotatable by means of gear wheel 64 thereon driven by worm 65 on shaft 66 mounted in bearing 67 on the floor of the cabinet and being driven in turn by motor shaft 29 through pinion gears 68 and 69. Bracket or strap 70 is provided on the side of the cabinet to support and form a bearing for this shaft 66.

Movement of the cam 60 causes the following roller 59 and arm 56 to be depressed which lowers the end of the wire 54 connected thereto and raises the chamber 42 to horizontal position as shown in dotted lines in Fig. 2. Just before the chamber is horizontal the tab 52 will contact the bottom of a chute 71 (see Fig. 9) which forces the rod 50 to rotate and carry with it the doors 47 whereby to open all the doors and discharge the pins from the chamber 42 into the aligned chutes 71 along which they slide by reason of gravity into tubes 72 integrally or otherwise connected to chutes 71.

The tubes 72 lead to vertical tubes 73, the bottoms of which are slightly below the point where they are joined by tubes 72. These tubes 73 are open at the bottom into which extend the upper ends of a set of plungers 74 mounted on or carried by plate 75. The plungers are of such height that when fully raised by means of the plate the tops are flush with the top of floor 10 through which they extend in openings 76 therein.

On the underside of the plate 75 is rigidly attached post or head 77 having cross pin 78 extending therethrough. This pin extends through slots 79 in yoke 80 on the end of arm 81. The other end (not shown) of this arm is fulcrumed or swingably mounted in the front of the cabinet. The arm is also provided with following roller 82 contacting the face of the cam 83 on shaft 61 whereby movement of the shaft and cam raises and lowers the arm 81 to raise and lower the plungers 74 in the tubes 73.

Shaft 61 is also provided with a cam 84, the

face of which is contacted by following roller 85 on arcuate arm 86, one end of which is swingably mounted on stub shaft 87 and connected at its other end to rod 88 which operates bell crank 89 which in turn operates and is connected to one end of sweeper 90 on the floor or alley 10. This sweeper is designed to remove the deadwood from the alley into the pit (see Figs. 1 and 3).

The ball propelling mechanism 20 comprises cylinder 91 rotatable in sleeve mounting 94 swingably secured to the bottom of cut-out portion 19 in the front of the machine. Collars 92 are secured as by screws 93 to the cylinder on each side of the mounting whereby to prevent removal of the cylinder from its mounting. In the top of members 91 and 94 are registered openings 95 to receive a ball 35 from the end of a runway 37. The member 94 is also provided with back stop 96 to guide the ball through openings 95 into chamber 97 in cylinder 91.

Cylinder 91 is open at its rear end but closed by member 98 at its front end. Member 98 is provided with neck 99 forming an elongated bearing 100 adapted to receive plunger 101 having handle 102 at its front or outer end and piston 103 at the other. Spring 104 encompasses the piston rod or plunger and is positioned between members 98 and 103 to normally retain the plunger in its forward position shown in Fig. 10. Rigidly secured to closure member 98 is channel member 105. This member is arcuate in cross section and is of such a size that the ball will rest on the upper edges of the arcuate channel at but point contacts and to one side of the center of mass of the ball (see Fig. 12). In its normal position, this member will be directly below the openings 95 to receive the ball (see Fig. 10).

Cylinder 91 and member 105 are rotatable so that after the ball is received in member 105 the cylinder may be rotated to one side or the other, thereby turning member 105 with it. When the plunger is pulled back and released to propel the ball, the latter will leave the end of the mechanism with the spin desired by the player because it will derive its spin from its support on the edges of the arcuate channel in the member 105, this support being to one side of the center of mass of the ball. For example, if the member 105 is turned to either side of its normal position, the ball will spin when going down the alley and thereby acquire "english" to curve it into the pins.

Also located on shaft 61 are cams 107 and 108 which contact mercoid switches 109 and 110, respectively, for stopping the motor at predetermined intervals. In the front of the cabinet may be located coin slot 111 for putting a coin operated starting mechanism (not shown) into operation. A push button 112 is also provided to start the motor when desired. The coin control mechanism, electrical circuits, etc. used are of the usual type and, as they do not form a part of the invention, are not shown.

The operation of the device is as follows:

A coin is put in the slot 111 which operates the motor long enough for the cam 83 to raise the plungers 74 to their top position at which time cam 107 contacts switch 109 to shut off the motor, whereby the bottoms of pins 34 are flush with the top of the alley. The ball propelling mechanism is then operated manually to propel the ball. Push button 112 is then pushed which starts up the motor and cam 83 lowers the plungers with the standing pins still remaining thereon. At the same time, cam 84 operates the sweeper mechanism which sweeps the deadwood into the pit and then returns to its normal position in cut-out portion 14 underneath the member 12. As soon as the sweeper is returned, cam 83 raises the plungers to their uppermost position and places the standing pins in position to be knocked down by a second ball, at which point cam 108 contacts mercoid switch 110 to again stop the motor.

At most times that the motor is operating, the belt 26 is functioning to raise the fallen pins and used balls into the chute 36 where the balls go down the runway 37 and the pins down the tube 39 into the magazine 42. As soon as the magazine is filled, the other pins (two or more sets of pins are provided so that the magazine may be refilled as soon as emptied and returned to its initial position) falling through the tube 39 will strike the top of the last pin therein and be deflected onto the floor 22 of the pit 21, then down to well 25 to be picked up by the belt or chain 26 again. However, it is not necessary to move the belt while the magazine is in horizontal position or while being raised thereto or lowered therefrom. I therefore provide a clutch 110 on motor shaft 29 and operated by solenoid 111 to stop the movement of the belt. This solenoid is connected to mercoid switches 108 and is operated by it to operate clutch 110.

After the second ball has been shot, it is necessary to insert another coin to again operate the motor. When this is done the cam 60 presses arm 56 which raises the magazine 42 and the pins 34 therein are dumped into the chute 71 and through tubes 72 onto the plungers 74 which have been again lowered by the cam 83 into their lowermost position to receive the pins. It will be apparent that the machine may be easily adjusted whereby a single coin will operate the device more than twice or that the coin actuated switch may be done away with entirely.

In order to speed up the game, several balls are used in order that it will not be necessary to wait until the ball is brought up by the belt 26. However, so that only one ball will be available each time, a rack 115 is mounted in opening 116 in the bottom of runway 37. This rack is rotatable or pivotally mounted on pin 117 in lugs 118 attached to or formed integrally with runway 37 and is normally held in the position shown in Fig. 13 by spring 119 attached to projection 120 on the bottom of runway 37. The flange 121 of the rack when held in this position will act as a barrier to prevent the balls 35 from going beyond it. This rack is directly in the path of bell crank 89 so that each time it is brought forward to operate the sweeper 90 it will contact the rack and push it forward, lowering flange 121 to permit one of the balls 35 to enter the rack and be held between the flanges 121 and 122. When the bell crank 89 returns to its former position after the sweeping operation is completed, rack 115 is brought back to its former position because of spring 119 and the ball 35 is moved over flange 122 and rolls by gravity down the alley to the ball propelling mechanism. It is understood that the back of the runway is higher than the front to permit this. The alley itself, however, is slightly elevated in front so as to insure the ball will roll into the pit. The ball propelling mechanism is tilted slightly upwardly at its rear or open end so that the ball will not run out thereof until the plunger is operated.

Having thus disclosed my invention, I claim:

1. A bowling game comprising an alley with free pins thereon, a ball propelling mechanism at one end thereof, a pit for receiving deadwood overturned by the ball at the other end thereof and having a sloping floor ending in a well, an endless conveyor associated with the pit for receiving the deadwood and transporting it from the well to a position above the alley, means for returning the ball to the propelling mechanism comprising a chute and a runway, an opening in the chute for receiving the pins, a tube connecting with said opening and having means to discharge the pins below the alley and in upright position, a magazine for receiving the pins, means for raising the pins to the floor of the alley, and means for discharging the pins from the magazine into the raising means.

2. A bowling game comprising an alley with free pins thereon, a ball propelling mechanism at one end thereof, a pit for receiving deadwood overturned by the ball at the other end thereof and having a sloping floor ending in a well, an endless conveyor associated with the pit for receiving the deadwood and removing it from the well to a position above the alley, means associated with said conveyor for returning the ball to the propelling mechanism comprising a chute and a runway, an opening in the chute for receiving the pins, a tube connecting with said opening and having means to discharge the pins below the alley and in upright position, a magazine for receiving the pins from the discharge means and comprising an elongated normally vertical magazine having a plurality of doors on a single hinge, means for raising the magazine to a substantially horizontal position, means for rotating the hinge to discharge the pins from the magazine, a set of chutes for receiving the discharged pins and along which the pins are adapted to slide to be delivered into a set of tubes, and means in said tubes for raising the pins to the floor of the alley.

3. In a bowling game having means for removing the pins from the alley and means for returning the pins to the alley, a magazine for receiving and storing the pins until ready to be returned, comprising an elongated compartment pivoted at one end, and having doors with a common hinge for discharging the pins from the magazine into the returning means.

4. In an automatic bowling game, means for storing pins until ready for use, comprising an elongated magazine having doors therein on a single hinge, and members depending from the magazine at each end of the doors to provide guiding and retaining means for the pins when the doors are opened.

5. In a bowling game having means for removing a set of pins from the alley and means for storing another set of pins in a magazine while the game is being played, means for raising the second set to the alley after the first set has been removed therefrom, means for transferring the second set to the raising means, and means for making the storing means inoperative while the transferring means is in operation.

CARL WEBER.