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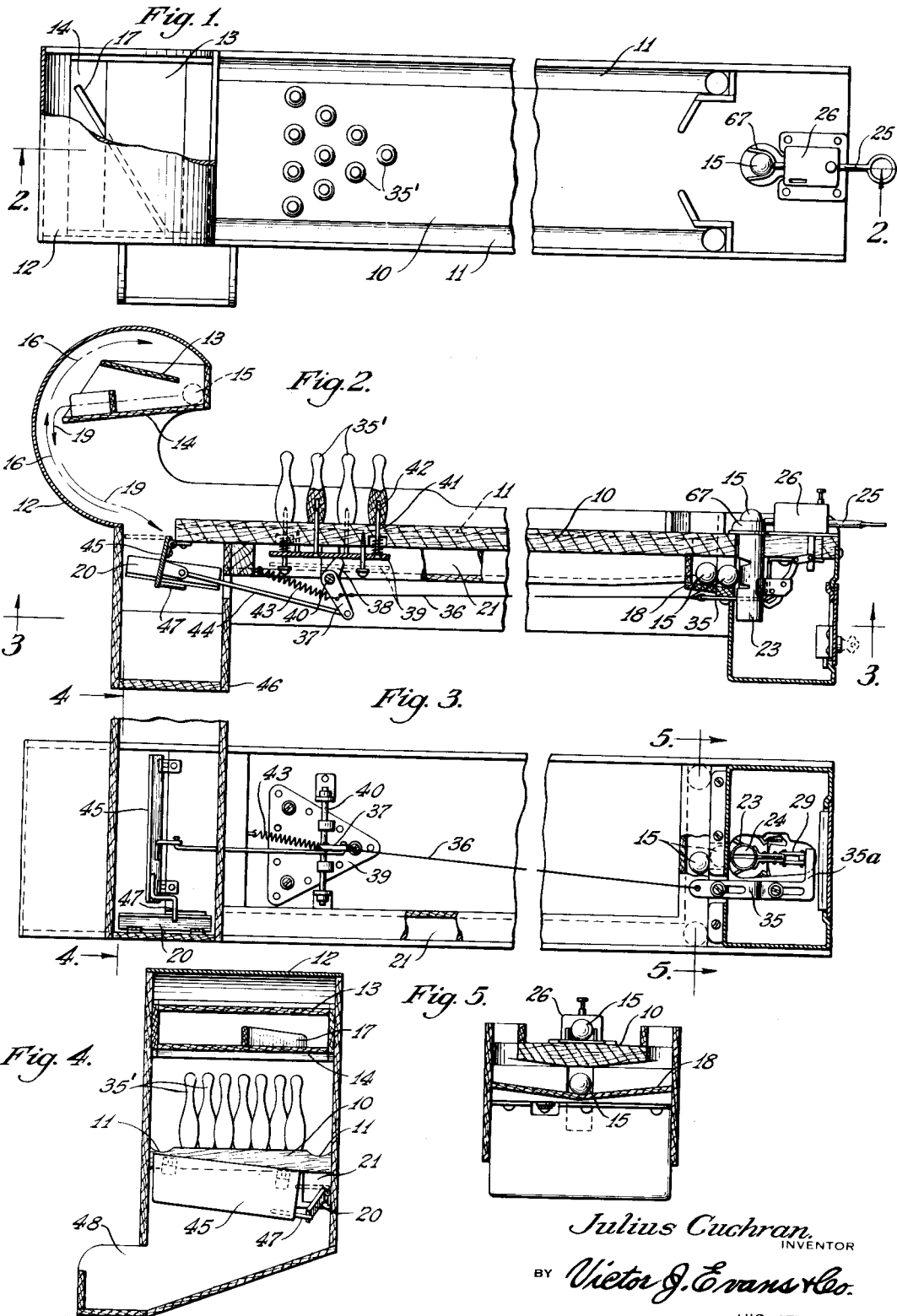
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BOWLING GAME APPARATUS

Filed Nov. 27, 1931

2 Sheets-Sheet 1



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INVENTOR

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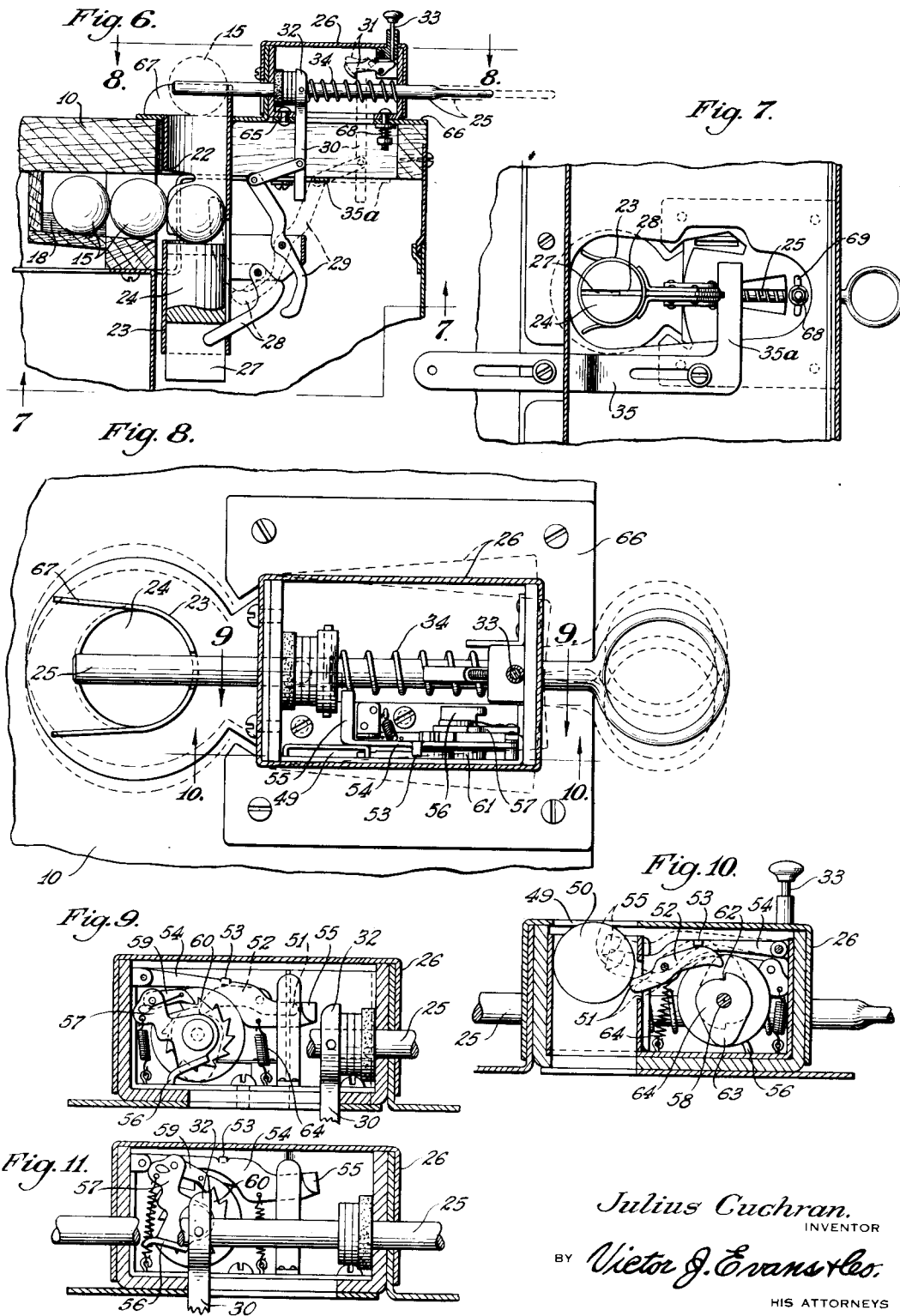
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UNITED STATES PATENT OFFICE

JULIUS CUCHRAN, OF CHICAGO, ILLINOIS

BOWLING GAME APPARATUS

Application filed November 27, 1931. Serial No. 577,594.

This invention relates to certain novel improvements in bowling game apparatus, and has for its principal object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

Among the objects of this invention are: to provide novel and entertaining bowling game apparatus; to provide a novel and efficient pin-spotting mechanism; to provide a novel and efficient missile or ball projecting mechanism; to provide a novel and efficient coin control for the missile or ball projecting mechanism; to provide means for controlling the operation of the pin-spotting mechanism by the ball projecting mechanism; to provide novel means for automatically returning the ball to the projecting mechanism after each play; and to provide the novel combination that will appear in the detailed description and be claimed hereinafter.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a top plan view of the apparatus; Fig. 2 is a sectional view on line 2—2 in Fig. 1;

Fig. 3 is an inverted or bottom plan view on line 3—3 in Fig. 2;

Fig. 4 is a sectional view on line 4—4 in Fig. 2;

Fig. 5 is a sectional view on line 5—5 in Fig. 3;

Fig. 6 is a detail view of the ball projecting mechanism;

Fig. 7 is an inverted or bottom plan view of the ball projecting mechanism and taken on line 7—7 in Fig. 6;

Fig. 8 is a top plan view on line 8—8 in Fig. 6 showing the ball projecting mechanism and its coin control;

Fig. 9 is a detail view of the coin control for the ball projecting mechanism, on line 9—9 in Fig. 8;

Fig. 10 is a detail view of the coin control for the ball projecting mechanism, on line 10—10 in Fig. 8; and

Fig. 11 is another detail view of the coin control for the ball projecting mechanism.

Referring to the drawings which illus-

trate a preferred and practical embodiment of the invention, a bowling alley or playing surface is indicated at 10 and has along the sides thereof gutters 11 which are adapted to conduct the balls 15 back to a ball-receiving magazine 18 located below the playing surface 10 in case a ball has insufficient momentum imparted to it to carry it up the bank board 12 located at the head end of the alley 11. The bank board 12 terminates in a shelf 14 above which is a baffle 13 whereby a ball or missile 15, projected over the alley 11 with sufficient momentum will follow the arrows 16 (Fig. 2), over the baffle 13 and onto the shelf 14 and be directed by an oblique board 17 along the path of the arrows 19 onto a hinged trap 20. The trap controls the entrance to a gutter 21 that leads below the alley 10 back to the ball-receiving magazine 18.

At the mid-point of the magazine 18 is an inlet 22 (Fig. 6) to a cylinder 23 in which is a vertically movable piston 24 by which the balls 15 are elevated, one at a time, up to, and held in front of, a ball-projecting gun 25 that is slidably mounted in a casing 26.

Provided in the ball-elevating piston 24 is a slot 27 (Figs. 6 and 7) in which works a pivotal lever 28 that is operated by a link mechanism 29 having pivotal connection with an arm 30 carried by the gun 25.

When the gun 25 is retracted from full to dotted line position of Fig. 6 the arm 30 actuates the link mechanism 29 which in turn pivots the lever 28 raising the lever 28 in the slot 27 and elevating the plunger or piston 27; whereby the plunger elevates a ball 15 into position in front of the gun 25. The gun 25 is held in retracted position and the plunger 24 in elevated position by engagement of a latch dog 31 with a detent 32 formed on the upper end of arm 30, whereupon when a plunger 33 is depressed against the dog 31 the gun 25 is projected, by a spring 34 against the ball 15 that is disposed on the plunger or piston 24 whereby said ball is projected over the alley 10 toward the pins 35. This forward motion of gun 25 and its arm 30 pivots the link mechanism 29 counterclockwise (Fig. 6) and the lever 28 falls by gravity in the piston slot 27 permitting the piston 24 to fall so that its upper end comes below the inlet 22 to the cylinder whereupon another ball

15 will roll from the magazine 18 into the cylinder 23 upon the piston 24 so that when the gun 25 is again retracted the piston 24 will elevate another ball into position in front of the gun 25.

Retraction of the gun 25 causes the lower end portion of arm 30 to engage a portion 35a of a slide bar 35 which is attached by a flexible element 36 to an arm 37 carried by a rock shaft 40. This pivotal element 37 carries a cam 38 which engages vertically slidable pin-spotting means 39. Retraction of the gun 25 acts through arm 30, slide bar 35, flexible element 36, element 37 and cam 38 to move the pin-spotting plate 39 upwardly, registering the pins 41 on the plate 39 with the slots 42 in the pins 35', and thus spotting the pins 35'. The plate 39 is spring urged downwardly by a spring 43 when the gun 25 is released; spring 43 thus moving the pins 41 out of registration with slots 42 in the pins 35 while spring 43 also acts through elements 37 and 36 to retract the slide bar 35, (to the left, Figs. 3, 6, and 7) to its initial position.

At the same time that the gun 25 is released and the pins 41 moved out of registration with slots 42 in pins 35, the spring 43 acts through a rod 44 that is pivotally connected to link 37 to close a hinged trap 45 that controls the entrance to a pin-receiving well 46, while motion of trap 45 likewise closes the trap 20 at the entrance to the gutter 19; the trap 45 carrying an arm 47 which is disposed under the trap 20, whereby a ball 15 that has run up the bank board 12 may roll down onto the trap 20 and into gutter 21 and back to magazine 18. However, when the gun 25 is retracted the slide bar 35 acts through flexible element 36, element 37 and rod 44 to open (Fig. 2) the traps 20 and 45 so that the pins 35 which have been knocked down may be manually moved into well 46. In case a ball has not had sufficient momentum to travel up the bank board 12 it will fall into the trap 20 so that when the trap 20 is opened by retraction of the gun 25 the ball will roll down into the well 46 from which it may be manually removed by way of outlet 48 (Fig. 4) and placed in a gutter 11 for return to the magazine 18.

Provided in the casing 26 is a coin slot 49 (Figs. 8 to 11) and when a coin 50 is inserted therein it falls upon the nose 51 of a pivotal latch dog 52 which is thus pivoted (counterclockwise, Fig. 10) into engagement with an arm 53 of a pivotal stop 54 thereby raising the arm 55 of the stop 54 (counterclockwise, Fig. 9) out of alignment with the detent 32 of the arm 30 and thus permitting retraction of the slidable gun 25 whereupon the arm 30 and detent 32 may be manually moved from the position of Fig. 9 to the position of Fig. 11.

When the gun or shaft 25 is moved from the position of Fig. 9 to the position of Fig. 11 the arm 30 carried by the gun engages a lip 56 on a plate 57 that floats on a shaft 58 in the casing 26. Pivotaly mounted on the plate 57 is a pawl 59 which, when the plate 57 is moved (clockwise Figs. 9 and 11) engages the teeth of a ratchet 60 which also floats on shaft 58, thereby rotating the ratchet clockwise (Figs. 9 and 11). Attached to the ratchet 60 and likewise floating on shaft 58 is a cam 61 (Fig. 10) in which is provided a notch 62 and which has a cam face 63. The dog 52 is normally engaged with the notch 62 in the cam 61, being urged thereto by a spring 64 which is attached to the lever 54 which has the lip 53 that extends over the dog 52. When the coin 50 is inserted into the slot 49 it raises the dog 52 out of engagement with the notch 62 in cam 61 permitting the cam to be rotated (counterclockwise Fig. 10) by the engagement of arm 30 with lip 56 and consequent rotation of plate 57 and ratchet 60 (clockwise Figs. 9 and 11) on shaft 58. Each time therefore the arm 30 is retracted (to the left Figs. 9 and 11) the pawl 59 advances the ratchet 60 and the cam 61 one step and when the player has made a predetermined number of plays, as measured by the number of retractions of shaft 25 (six in the present instance) the cam face 63 of cam 61 engages the dog 52 and rotates the dog 52 (counterclockwise Fig. 10) from its position of Fig. 10, thereby permitting the coin 50 to fall in the slot 49. Further retractions of shaft or gun 25 advance the ratchet 60 step by step and each of these steps rotates the cam 61 (clockwise Fig. 10) until the notch 62 in the cam 61 comes opposite the nose of dog 52 whereupon the spring 64, pulling down on lever 54 and its lip 53, rotates the dog 52 (clockwise Fig. 11) and engages the nose of the dog 52 in the notch 62 thereby bringing the arm 55 of stop lever 54 into alignment with the detent or head 32 of arm 30 and thus preventing further retraction of shaft 25, while at the same time locking the cam 61, ratchet 60, and plate 57 against further movement until another coin is inserted into slot 49 to lift the dog 52 out of notch 62.

There being, in the present instance, twelve teeth on the ratchet 60 it will be noted that six plays or operations of gun 25 may be made before the coin 50 is liberated and before the dog 52 is engaged in notch 62 of cam 61 by the action of spring 64 and the arm 55 of stop lever 54 is aligned with the head 32 of arm 30 which prevents further operation of shaft 25.

By reference to Figs. 6 and 8 it will be noted that the piston cylinder is integral with the casing 26 and that both casing 26 and cylinder 23 are pivotally mounted at 65 on a plate 66 for movement in a hori-

zontal arc whereby the gun 25 may be aimed and the ball 15 shot down the alley 10 at a preselected pin or pins 35'; the cylinder 23 having a splayed mouth 67 at its upper end which turns with the gun and in which the ball reposes when elevated by the piston 24 into position in front of the gun 25. The casing 26 is tensioned to the plate 66 by a tensioning device 68 which is arranged in a slot 69 (Fig. 7) in the plate 66.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. Bowling game apparatus comprising a member providing a playing surface, a ball-receiving magazine communicating with said playing surface, mechanism to project playing balls over said surface, means for elevating the balls one at a time from the magazine to said playing surface, means operatively interconnecting said ball-projecting mechanism and said ball-elevating mechanism whereby when said ball-projecting mechanism is operated preparatory to its projection said elevating mechanism is raised and a ball elevated thereby from said magazine to said playing surface in front of said projecting mechanism, pins on said playing surface, pin-spotting mechanism, and means operatively interconnecting said projecting and elevating mechanisms with said pin-spotting mechanism whereby the latter is engaged with said pins when a ball is elevated from said magazine into position in front of said projecting mechanism.

2. In bowling game apparatus, a member providing playing surface, pins and balls to be played thereat upon said surface, pin-spotting mechanism, mechanism to project said balls over said surface at said pins, and means operatively interconnecting said mechanisms whereby when said projecting mechanism is operated preparatory to its projection said pin-spotting mechanism is engaged with said pins.

3. In bowling game apparatus, a member providing a playing surface, pins and balls to be played thereat upon said surface, pin-spotting mechanism, mechanism to project said balls over said surface at said pins, means operatively interconnecting said mechanisms whereby when said projecting mechanism is operated preparatory to its projection said pin-spotting mechanism is engaged with said pins, and means to disengage said

pin-spotting mechanism from said pins when said projecting mechanism is operated to project a ball over said surface.

4. In a game apparatus, a member providing playing surface, a ball-receiving magazine communicating with said surface, slidable means arranged at the playing surface to project playing balls one at a time thereover, a plunger adapted to receive the balls one at a time from the magazine and elevate them to the playing surface into position to be driven thereover by said slidable means, and means operatively interconnecting said slidable means and plunger whereby when said slidable means is operated preparatory to its projecting operation said plunger is moved to elevate a ball from the magazine to the playing surface and into position in front of said slidable means.

5. In game apparatus, a member providing a playing surface, a trap in said surface, pins, pin-spotting mechanism, mechanism to project playing balls over said surface at said pins, means operatively interconnecting said mechanisms whereby when said projecting mechanism is operated preparatory to its projection said pin-spotting mechanism is engaged with said pins, and means operatively interconnecting said trap and said pin-spotting mechanism whereby said trap is opened when said pin-spotting mechanism is engaged with said pins.

6. In game apparatus, a member providing a playing surface, a ball-receiving magazine, a trap in said surface, pins, pin-spotting mechanism, mechanism to project playing balls over said surface at said pins, means operatively interconnecting said mechanisms whereby when said projecting mechanism is operated preparatory to its projection said pin-spotting mechanism is engaged with said pins, a runway leading from said trap to said magazine, means operatively interconnecting said trap and said pin-spotting mechanism, and a gate operable by said trap and controlling said runway.

7. In game apparatus, a member providing a playing surface, a curvilinear bank board at one end of said surface, a ball-receiving magazine, a runway leading from said end to said magazine, means associated with said bank board to direct played balls from the upper portion of said board to said runway, a trap at the bottom of said board, pins, pin-spotting mechanism, mechanism to project the balls over said surface at said pins, means operatively interconnecting said mechanisms whereby when said projecting mechanism is operated preparatory to its projection said pin-spotting mechanism is engaged with said pins, a gate operable by said trap controlling said runway, and means operatively interconnecting said trap and said pin-spotting mechanism.

JULIUS CUCHRAN. 130