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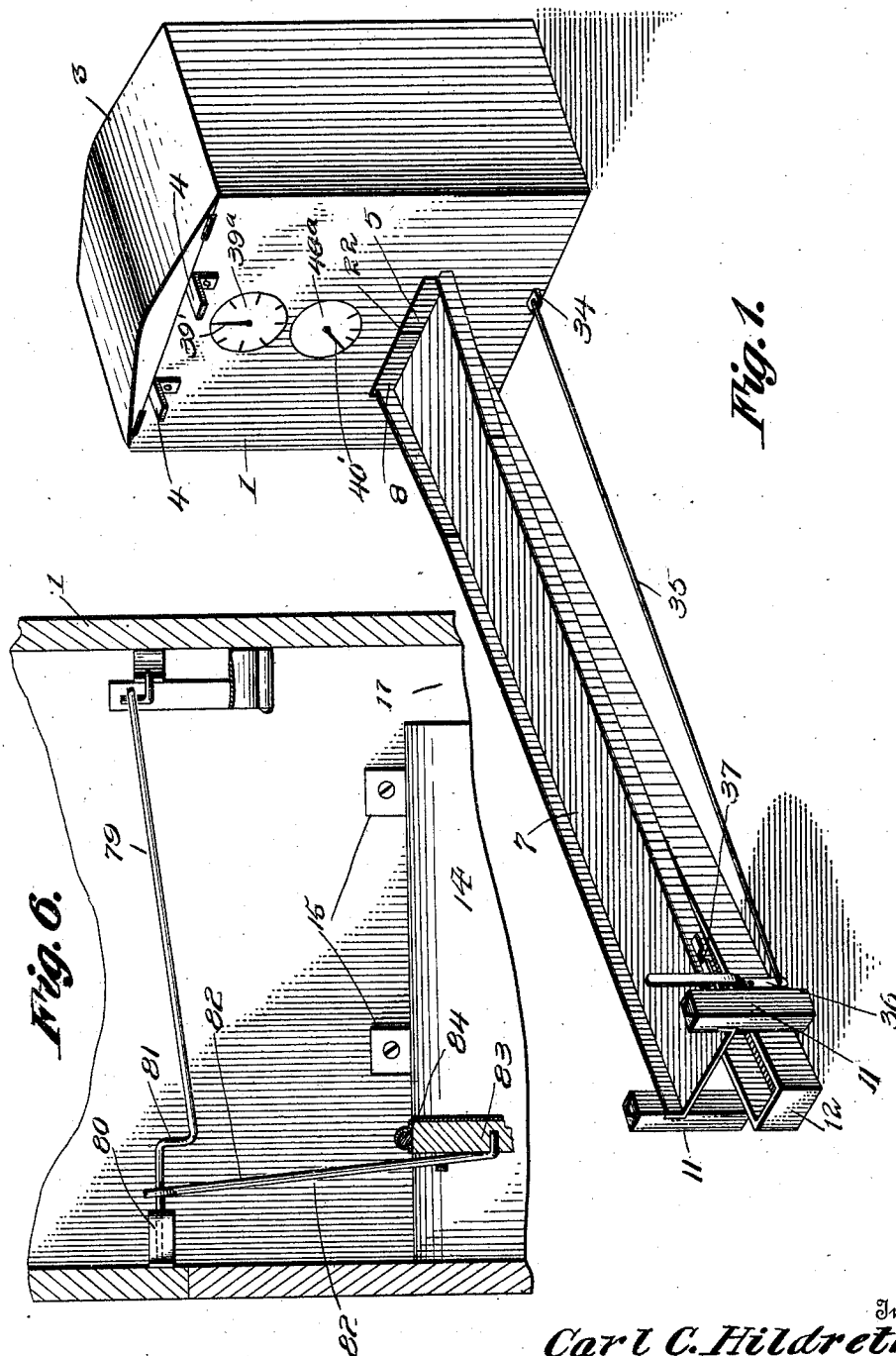
BOWLING APPARATUS.

APPLICATION FILED SEPT. 24, 1909.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 1.

976,738.



Witnesses
Chas. Richardson.
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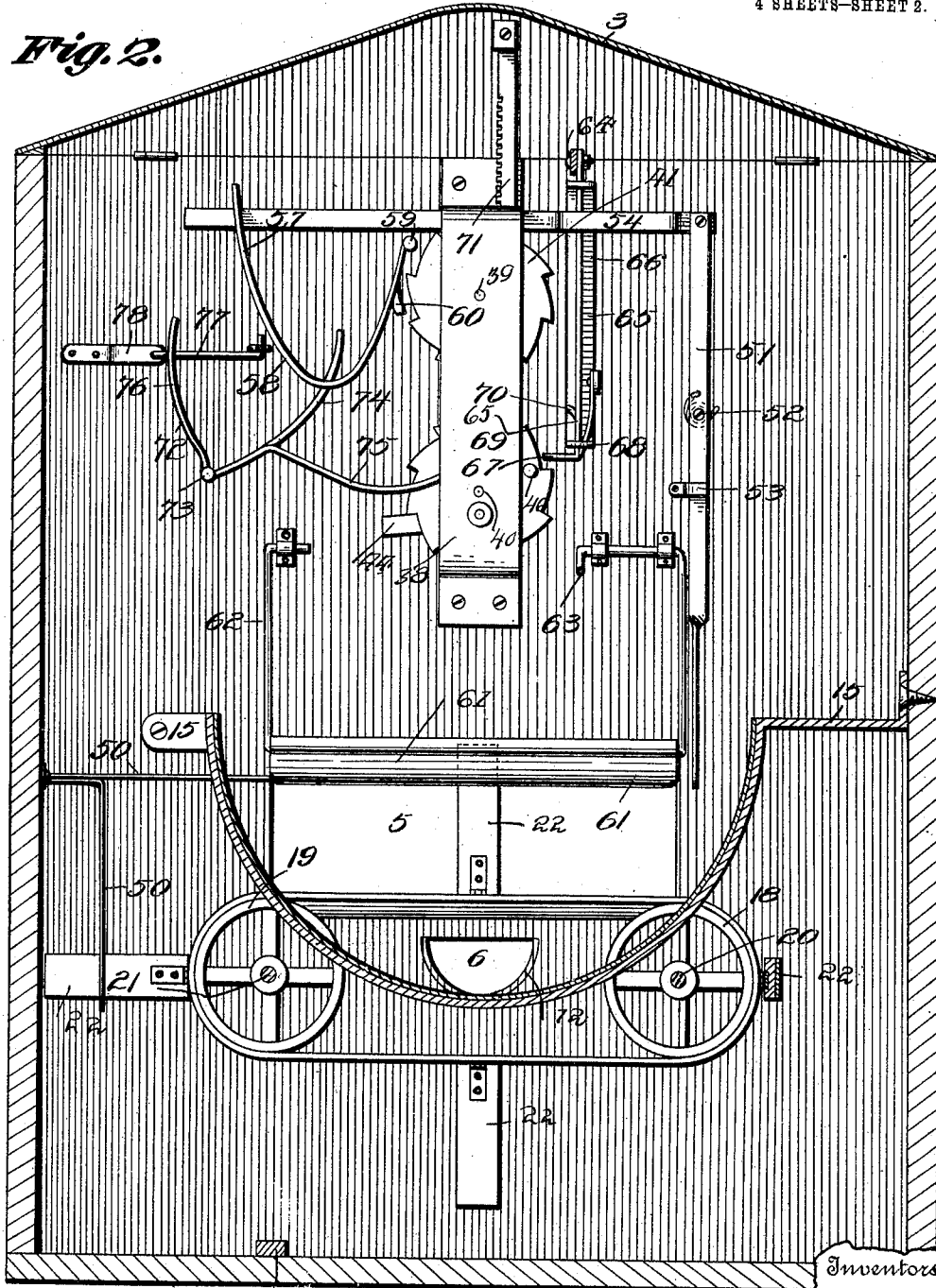
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4 SHEETS—SHEET 2.

Fig. 2.



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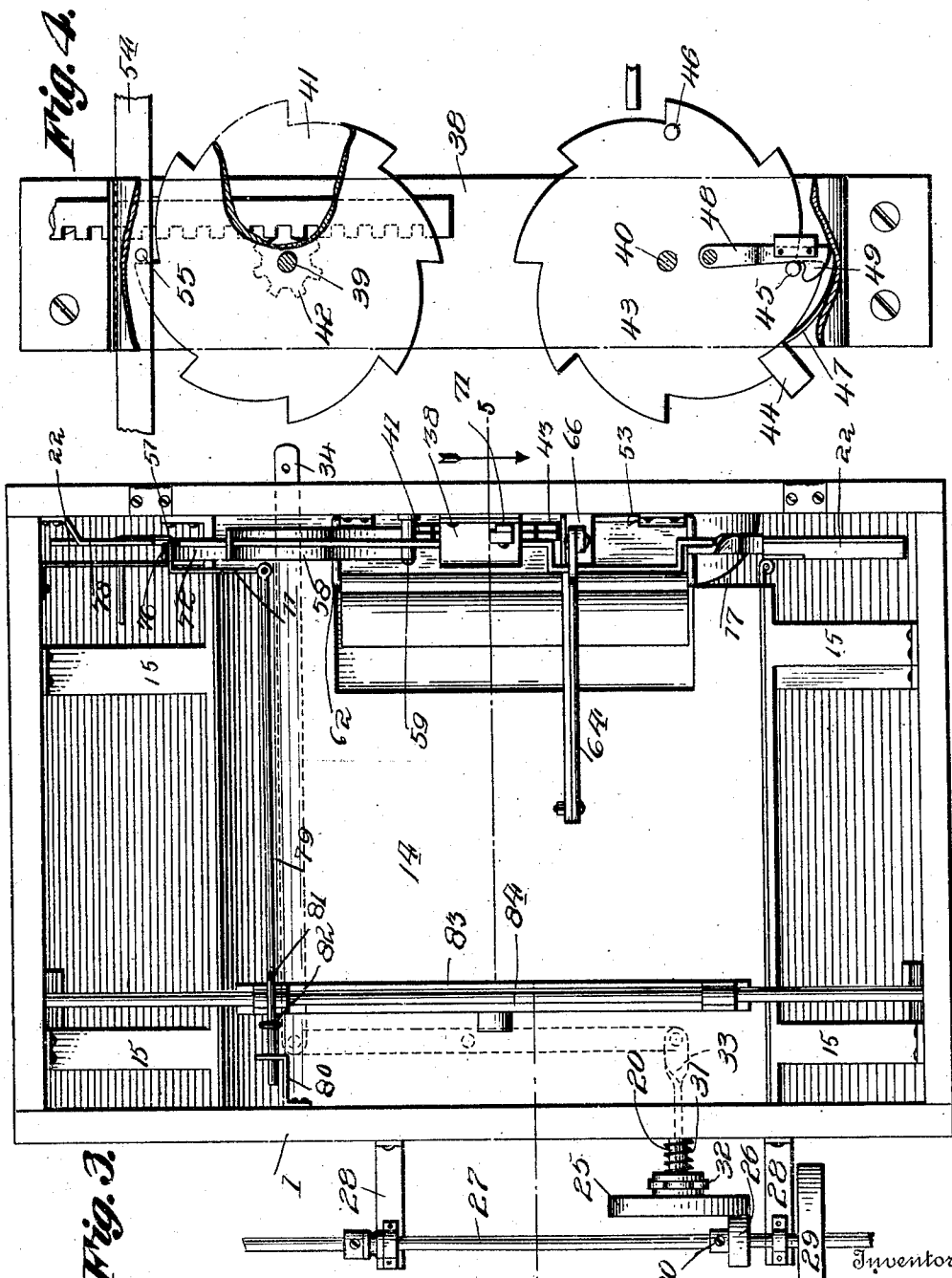
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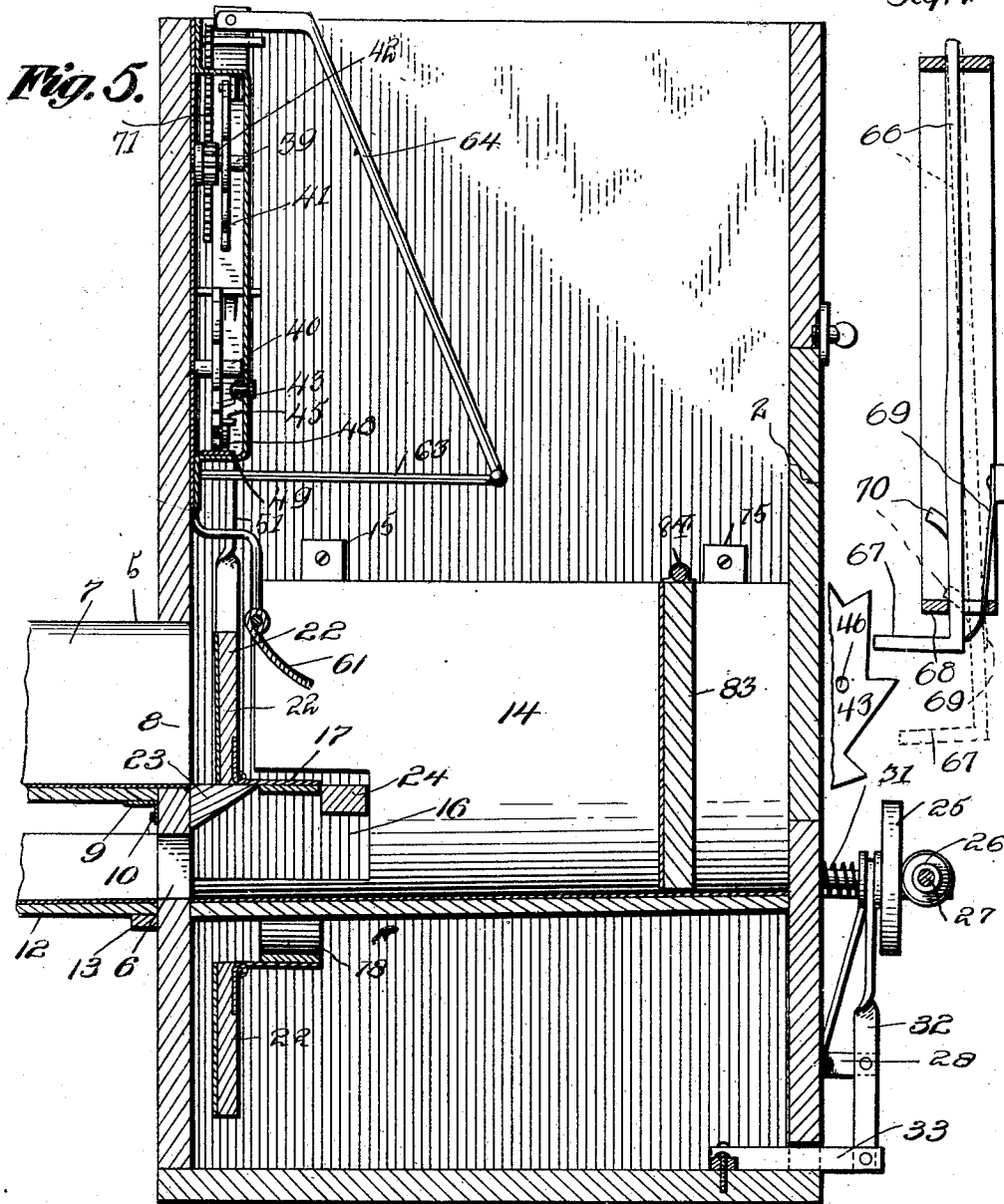
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4 SHEETS—SHEET 4.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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BOWLING APPARATUS.

976,738.

Specification of Letters Patent. Patented Nov. 22, 1910.

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To all whom it may concern:

Be it known that we, CARL C. HILDRETH and HERBERT F. COOK, citizens of the United States, residing at Lake Mills, in the county of Winnebago and State of Iowa, have invented new and useful Improvements in Bowling Apparatus, of which the following is a specification.

This invention relates to a bowling apparatus designed essentially for playing a game closely simulating the game of baseball, the object of the invention being to provide an apparatus of this type embodying movable figures simulating players in the game who are to be bowled or struck out by the propelled balls, and which also embodies automatic means for registering the outs or figures struck and for registering the number of misses made and the consequent number of runs scored.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a bowling apparatus embodying our invention. Fig. 2 is a vertical transverse section through the casing thereof. Fig. 3 is a top plan view of the casing with the door or cover removed. Fig. 4 is a rear elevation, with parts broken away and in section, of the gearing for operating the pointers of the registering devices. Fig. 5 is a central vertical front to rear section through the casing. Fig. 6 is a similar section showing in detail features of construction of the releasing mechanism. Fig. 7 is a view showing a detail of construction.

Referring to the drawings, the numeral 1 designates a box or casing which incloses the operating mechanism of the apparatus, said casing being provided at its rear with a door 2 through which access may be secured to the contained parts and at its top with a lid or cover 3 hinged or pivoted thereto so that it may be turned forward to rest upon supporting brackets 4, to enable access to be secured to the casing from above.

The front wall of the casing is provided with a transverse slot or opening 5, and below the same with an opening 6. The opening 5 is adapted to receive the inner or delivery end of an alley 7 which has a projecting portion 8 to fit therein and is provided with brackets 9 having downturned

fingers to engage receiving loops 10 arranged below said openings 5, whereby the alley may be adjustably secured to the casing. The alley preferably inclines upwardly from its outer end to the opening 5 and is supported at such outer end by posts 11. Along this alley the balls are designed to be propelled to enter the casing through the opening 5, and in practice the alley may be lined with felt or other suitable material. In the use of the device for regulation bowling houses, amusement resorts, etc., where a full size apparatus is used and the alley is to be of regulation length, the alley may be constructed of sections suitably united, but in the embodiment of the invention in a toy the alley may consist of a single section. The major portion of the alley is of less width than the opening 5, but, as shown, its delivery end is outwardly flared or widened to accord in width with the length of the opening, thus requiring the bowlers or players to curve the balls under some conditions to strike the objects moving within the casing past said opening, thus increasing the difficulty in making expert shots as well as the proficiency of the players in bowling. The opening 6 is designed for the return of the propelled balls and registers with a movable return chute 12 extending beneath the alley 7 to a point beyond the outer end thereof, said chute being outwardly and downwardly inclined to return the balls to playing position by gravity. The inner end of the chute is adapted to rest upon a ledge or support 13 on the front wall of the casing 1 below the opening 6.

Arranged within the casing is a substantially U-shaped frame or trough 14 forming a ball receiving pit which extends between the front and rear walls and which may be lined in practice with padding or suitable cushioning material. The sides of this pit or trough are secured to portions of the casing by bracket arms 15. The bottom of the trough, as shown in Fig. 5, inclines downwardly and forwardly and registers at its forward edge with the base of the opening 6, so that the balls received therein will roll by gravity into the chute 12 and along the same back to the playing point. The forward portions of the side walls of the pit are suitably slotted as at 16 for the passage of an endless belt or conveyer 17 which is arranged transversely in rear of the opening 5 and below the plane thereof, and is

mounted upon suitable pulleys 18 and 19 carried by shafts 20 and 21 respectively. This endless belt or conveyer carries a series of men, figures or suitable objects 22 to be struck by the propelled balls, and which are adapted in their orbit of travel to successively move across the opening 5. Each of said figures is hinged or pivoted to the belt to swing from the vertical to a horizontal position, and vice versa, and in their path of movement across the opening 5 the bottom edges or hinged portions of the figures are adapted to travel in contact with a fixed horizontal guide bar 23. The upper stretch of the belt 17 moves between the guide bar 23 and a transversely extending guide bar 24 whereby such portion of the belt is sustained when the figures are struck and guided in a true path. If a figure passing the opening 6 should not be struck by a propelled ball, it will remain in a vertical position, but if a fair strike is made the figure will be knocked rearwardly to a horizontal position and lie upon the surface of the adjacent portion of the belt, until such portion of the belt becomes the return stretch, when the figure will drop to normal vertical position by gravity.

The game may be played by two or more bowlers or players, the figures or objects 22 representing opposing players in the game of base ball who are to be put out by the propelled ball. Each figure struck by a propelled ball counts an out or point in favor of the bowler, while each figure missed by a propelled ball counts a score or run for the opposing player or side. Each bowler or player is permitted to bowl a certain number of balls and any desired number of "boxes" or "innings" may be played, the bowler making the greatest number of strikes or outs and against whom the least number of runs is made winning the game. Means are provided whereby the hits or misses or outs and runs are automatically registered, so that an accurate count of the points scored in the game may be kept. The shafts 20 and 21 are journaled in bearings upon the front and rear walls of the casing, the bearings of the shaft 21 being preferably made adjustable, so that any slack in the belt may be conveniently taken up. The shaft 20 extends at its rear beyond the casing and carries a friction disk 25 feathered to slide thereon and rotate therewith. Said disk meshes with a friction driving disk 26 on a transverse drive shaft 27 journaled in bearing brackets 28 and carrying a pulley 29, whereby it may be driven from an electric or other suitable kind of motor. The gear 26 is slidably mounted on the shaft 27 so that it may be moved across the face of the disk 25 to vary the speed of driving motion imparted to the shaft 20 and the belt operated thereby, said driving

gear being adjustably secured in position by a set screw 30. The gear 25 is normally pressed outward into contact with the gear 26 by a spring 31 and its hub is annularly grooved to receive the forked end of an adjusting lever 32 fulcrumed on the frame and connected with a slide bar 33 extending into the casing. Said slide bar is suitably connected to a rod or bar 34 movable in an opening in the front of the casing and connected by another rod or wire 35 with a controlling lever 36 fulcrumed upon the outer end of the return chute 12, whereby the disk or gear 25 may be drawn inwardly to retract it from contact with the gear 26 or released so as to be maintained in contact with said gear by the spring 30. By this means the belt may be operated from a continuously driven motor and thrown into and out of operation at will. The lever 36 is adapted to interlock with a notch bar or rack 37 to secure it in its adjusted positions. If desired, the shaft 27 may be extended to operate the belts of a series of bowling devices of the character set forth, where a number are arranged side by side for use.

Arranged upon the inner side of the front wall of the casing is a supporting bracket 38 in which are journaled shafts 39 and 40, which shafts extend through said wall to the front of the casing where they are provided with indicator hands 39' and 40' movable around registering dials 39^a and 40^a. The dial 39^a is provided with a series of figures, preferably from "0" to "9," to indicate possible scores or runs made in the game, while the dial 40^a is provided with figures from "0" to "3" indicating number of misses or outs. Fixed to the shaft 39 is a ratchet wheel 41 and a pinion 42, said ratchet wheel being provided with a series of teeth equal in number to the marks or figures on the dial 39^a, and fixed upon the shaft 40 is a ratchet wheel 43 provided with a counterbalancing weight 44 to return it to normal or starting position and also provided with a pair of spaced trip pins 45 and 46. A curved locking spring or dog 47 is mounted on the bracket 38 to engage the teeth of the ratchet wheel and hold the same from retrograde movement while permitting a forward turning movement thereof. This spring is adapted to be engaged by a pivoted releasing arm 48 having a cam shaped end 49 to release said spring to permit the ratchet wheel to be returned by the weight 44 to normal position.

Arranged upon the casing beyond the right hand side of the opening 5 is a guide member 50 which holds the ascending figures 22 in a vertical position until they rest upon the guide bar 23. If the bowler should fail to strike the figure moving across the opening, the figure will retain its upright position and engage the lower end of an operat-

ing lever or trip device 51 arranged beyond the opposite side of the opening in position to be forced outwardly and allow the figure to pass downwardly after its actuation.

5 Said lever is pivotally mounted on the front wall of the casing as at 52 and is limited in its return movement by a stop 53. The upper end of the lever is pivoted to a sliding bar 54 movable through the bracket 38 and
10 provided with a pin or projection 55 to engage the teeth of the wheel 41, by which said wheel will be turned a distance of one tooth upon each actuation of said lever by a passing upright figure. A coiled spring 56 is
15 associated with the pivot 52 and acts upon the lever 51 to return the same after operation to normal position.

The free end of the bar 51 slidably engages a slot in one of the arms 57 of a U-shaped spring dog 58, the other arm of which is pivotally mounted upon the casing as at 59 and provided with a tooth or finger 60 to engage the teeth of the ratchet wheel 51 and permit forward movement of said
25 wheel while preventing retrograde motion thereof, so that the wheel can turn but a single step at a time. It will thus be understood that should the bowler miss one of the figures such figure will engage and operate
30 the lever 51, whereby the ratchet wheel 41 will be turned a distance of one tooth, thus moving the hand or pointer 39 correspondingly over the face of the dial 39^a to indicate that a run has been thereby scored against
35 the bowler.

Extending transversely in rear of the opening 5 so as to be struck by any of the figures 22 which may be knocked down by a bowled ball is a trip bar or plate 61 carried by a bail shaped frame 62 pivotally
40 mounted on the casing, whereby said bar is adapted to swing in a vertical plane. The frame 62 is provided with a rearwardly extending crank arm 63 connected by a link 64
45 with the upper end of a sliding dog or actuating bar 65 mounted on a guide bracket 66 and provided with a tooth or projection 67 to engage the teeth of the ratchet wheel 43. The bracket 66 has an arm 68 provided with
50 a slot through which the lower end of the dog slides, which slot is of a width to permit the tooth 67 to have lateral movement sufficient to throw it into and out of engagement with the path of movement of the teeth of
55 the ratchet wheel. A spring 69 is arranged upon the bracket to normally press the dog into operative position, so that when said dog is depressed it will engage the adjacent tooth of the wheel and turn the latter.
60 When the dog moves past the tooth an inclined projection 70 thereon engages the adjacent end wall of the slot and forces said dog outwardly against the pressure of the spring 69, allowing the dog to move up-
65 wardly again without contacting with the

ratchet wheel, which latter is held against retrograde movement by the spring 47 as previously described. When an object is struck by a ball the plate 61 is swung upwardly and rearwardly by said object and, through the action of the crank arm 63 and link 64, slides the dog upwardly to the position shown in Fig. 2, the spring 69 yielding on such movement of the dog to allow the tooth 67 to slide over and above the adjacent tooth of the ratchet wheel 43. When the object passes beyond the plate 61, the said plate, crank arm, link and dog drop by gravity, the tooth 67 of the dog engaging the said adjacent tooth of the ratchet wheel and turning said wheel in an obvious manner to operate the indicator hand 40'. Hence whenever a figure is struck and the trip device 61 is operated the ratchet wheel 43 will be turned a distance of one tooth and will move the pointer 40 a corresponding distance over the dial 40^a to indicate an "out."

The ratchet wheel 43 is adapted after having been moved to the limit of its indicating action to be returned to normal position by the weight 44 through the retraction of the spring 47 by the movement of the releasing arm 48, which latter is adapted to be struck and released by the pin 46 and to be returned to normal position after operation by the pin 45, as will be readily understood. The ratchet wheel 41 is adapted to be returned at the limit of its actuating movement to normal position by a weighted rack bar 71 which meshes with the pinion 42 and is elevated a prescribed distance on each turning movement of said ratchet wheel. As the ratchet wheel 41 is held from return movement by the projection 60 of the dog 57, means must be provided to effect the retraction of said projection when each player has completed his turn at play or bowled the designated number of balls and the full amount of his score in "outs" and the runs made against him have been registered. To this end a releasing device is provided comprising a substantially U-shaped member 72 pivotally mounted at 73 upon the casing. One of the arms of this member is provided with curved branches 74 and 75, the branch 74 slidably engaging a slot in the dog 58, while the branch 75 lies in the path of movement of the trip pin 45 of the ratchet wheel 43. When, therefore, said ratchet wheel 43 has reached the limit of its actuating movement, the pin 45 will engage the member 75 and swing the member 72 on its pivot, thus swinging the dog 58 on its pivot 59 away from the ratchet wheel 41 to retract the tooth 60, allowing said ratchet wheel to be returned to normal position by the descent of the weighted plunger or rack bar 71. The other arm 76 of the releasing device 72 slidably engages an arm 77 projecting from a pressure spring detent 78, into engagement

with which spring said arm is shifted when the releasing device is swung by the pin 45, as just described, by which the releasing device will be maintained in position to keep the dog 58 retracted, maintaining the registering apparatus out of operation until again set. Pivoted at its forward end to the arm 77 is a resetting rod 79, the rear end of which slidably engages an opening in a bracket 80 on the rear wall of the casing and is provided with a shoulder or offset 81. This slidably mounted end of the rod is engaged by a loop or eye on the upper end of an actuating rod 82 fixed at its lower end to a backing pad or swinging buffer plate or stop 83 closing the rear of the trough or pit and against which the balls strike and are brought to a stop. This buffer plate is mounted for yielding movement upon a rock shaft 84 journaled in suitable bearings at the sides of the casing, allowing said plate to yield when struck by a ball to prevent injury thereto and to arrest the motion of the ball in an effective manner. Upon the resumption of play, the first ball delivered by the bowler and striking against the buffer plate rocks said plate, thus transmitting movement to the rod 82 which strikes the shoulder 81 and forces the rod 79 forwardly, thus moving the spring 78 forwardly or away from the arm 76 and permitting the releasing device and dog 58 to return to normal position by gravity, resetting the registering mechanism in an automatic manner for further operation.

From the foregoing description, the construction and mode of operation of our improved bowling apparatus will be readily understood, and it will be seen that it provides an apparatus of the character described by which an interesting bowling game simulating the playing of the game of baseball may be carried out and the "outs" made and the runs scored automatically registered.

While the construction shown is preferred, it will be understood that such changes and modifications may be made as fairly fall within the scope of the invention defined in the appended claims.

We claim:—

1. A bowling apparatus embodying a casing having an opening, means for moving an object past the opening, a ball runway leading to the opening, means actuated by the object when struck by a ball to indicate a hit, and means operated by the object when passing beyond the opening to indicate a miss.
2. A bowling apparatus embodying a casing having an opening therein, an endless carrier carrying pivotal figures movable across the opening, a ball runway leading to the opening, a register, means operated by a struck object to actuate said register, a

second register, and means actuated by an unstruck object moving past the opening to actuate said second register.

3. A bowling apparatus embodying a casing having an opening, an endless carrier provided with pivoted figures arranged to be successively presented at the opening, a ball runway leading to the opening, registering devices adapted to be actuated respectively by struck and unstruck figures, and means for resetting said devices for a repetition of their indicating operation.

4. A bowling apparatus embodying a casing having an opening, an endless carrier provided with pivoted figures movable successively across the opening, a ball runway leading to the opening, a registering device for indicating the number of figures struck by the propelled balls, a second registering device for indicating the number of figures missed by the propelled balls, and means for respectively actuating said devices.

5. A bowling apparatus embodying a casing having an opening, an endless carrier provided with pivoted figures movable successively across the opening, a ball runway leading to the opening, a registering device for indicating the number of figures struck by the propelled balls, a second registering device for indicating the number of figures missed by the propelled balls, means actuated by a struck figure for operating the first named registering device, and means actuated by each unstruck figure for actuating the second named registering device.

6. A bowling apparatus embodying a casing having an opening, means for successively presenting a series of figures at the opening, a ball runway leading to the opening, a registering device for indicating the number of figures struck by the propelled balls, a second registering device for indicating the number of figures missed by the propelled balls, means for actuating said devices, and means for resetting the devices on reaching the limit of their registering motion to starting position.

7. A bowling apparatus embodying an opening, means for moving a series of figures past the opening, each figure adapted to be displaced out of normal position by a propelled ball, a ball runway leading to the opening, a registering device operated when a figure is displaced by contact of a ball therewith, and a second registering device adapted to be operated by each figure remaining in normal position after its passage beyond the opening.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:

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