No. 785,668. PATENTED MAR. 21, 1905.

A. FERLAND.

REGISTERING MECHANISM FOR TENPIN GAMES.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 1.

FIG. 1.

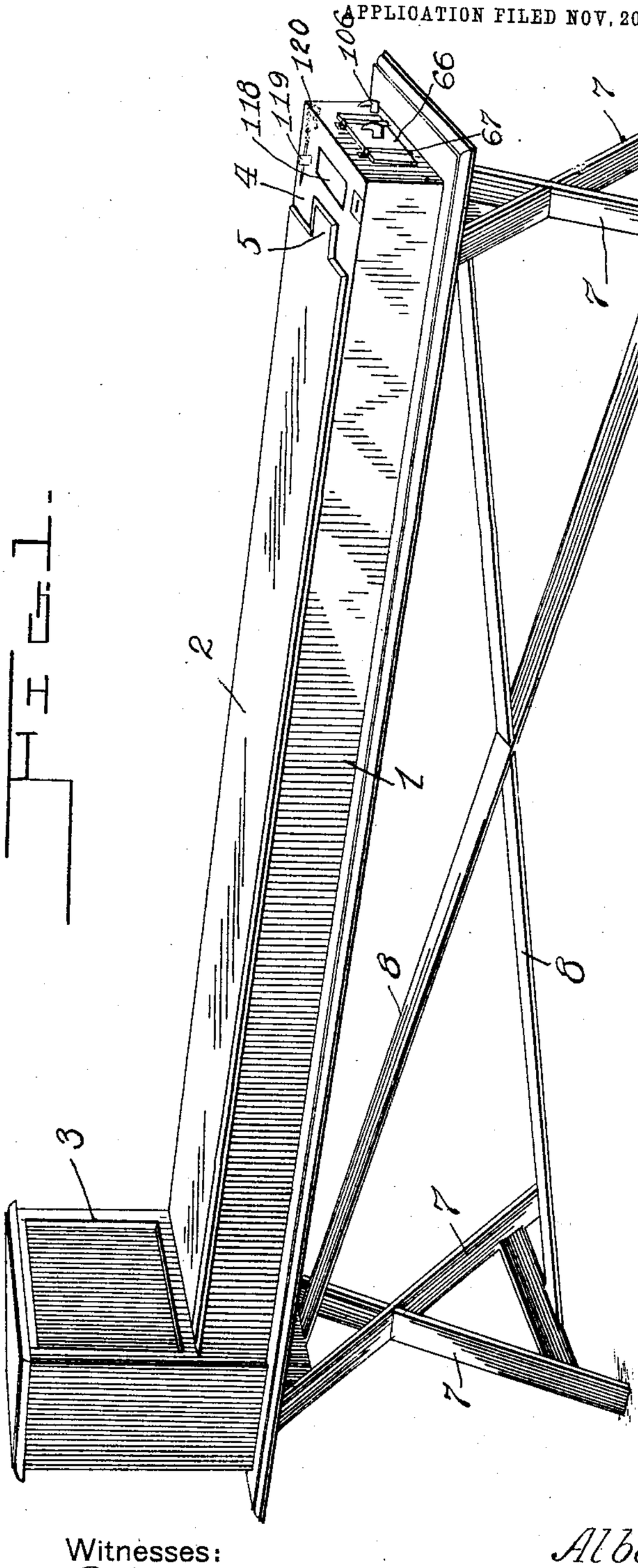
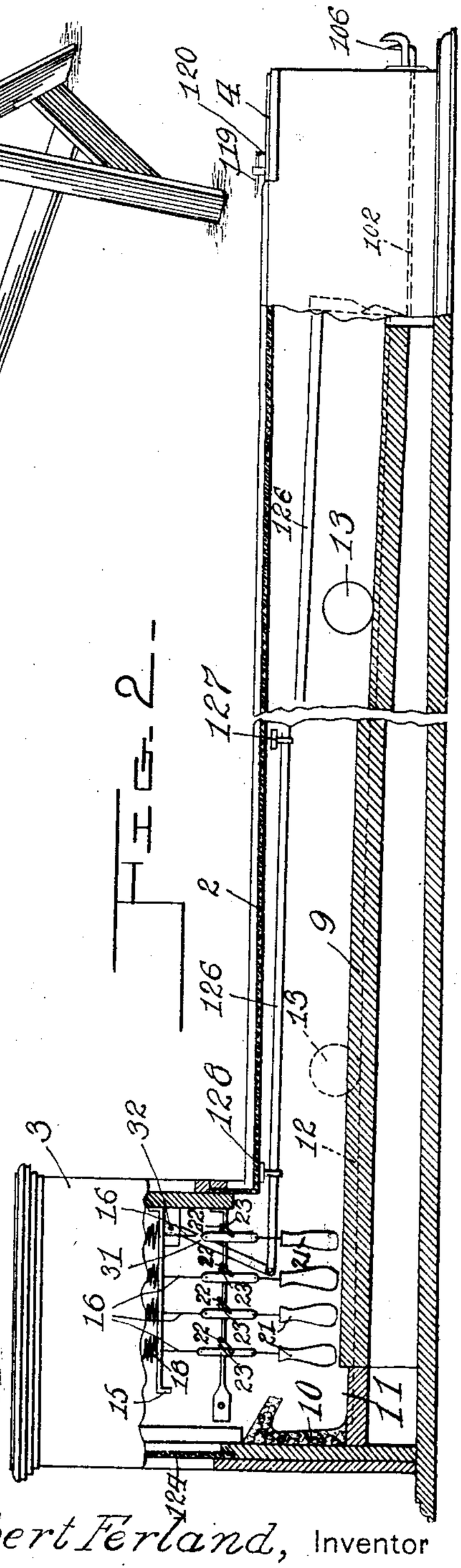


FIG. 2.



Witnesses:

J. L. Kenard

F. D. Ammen

Albert Ferland, Inventor

By Marion & Marion

Attorneys

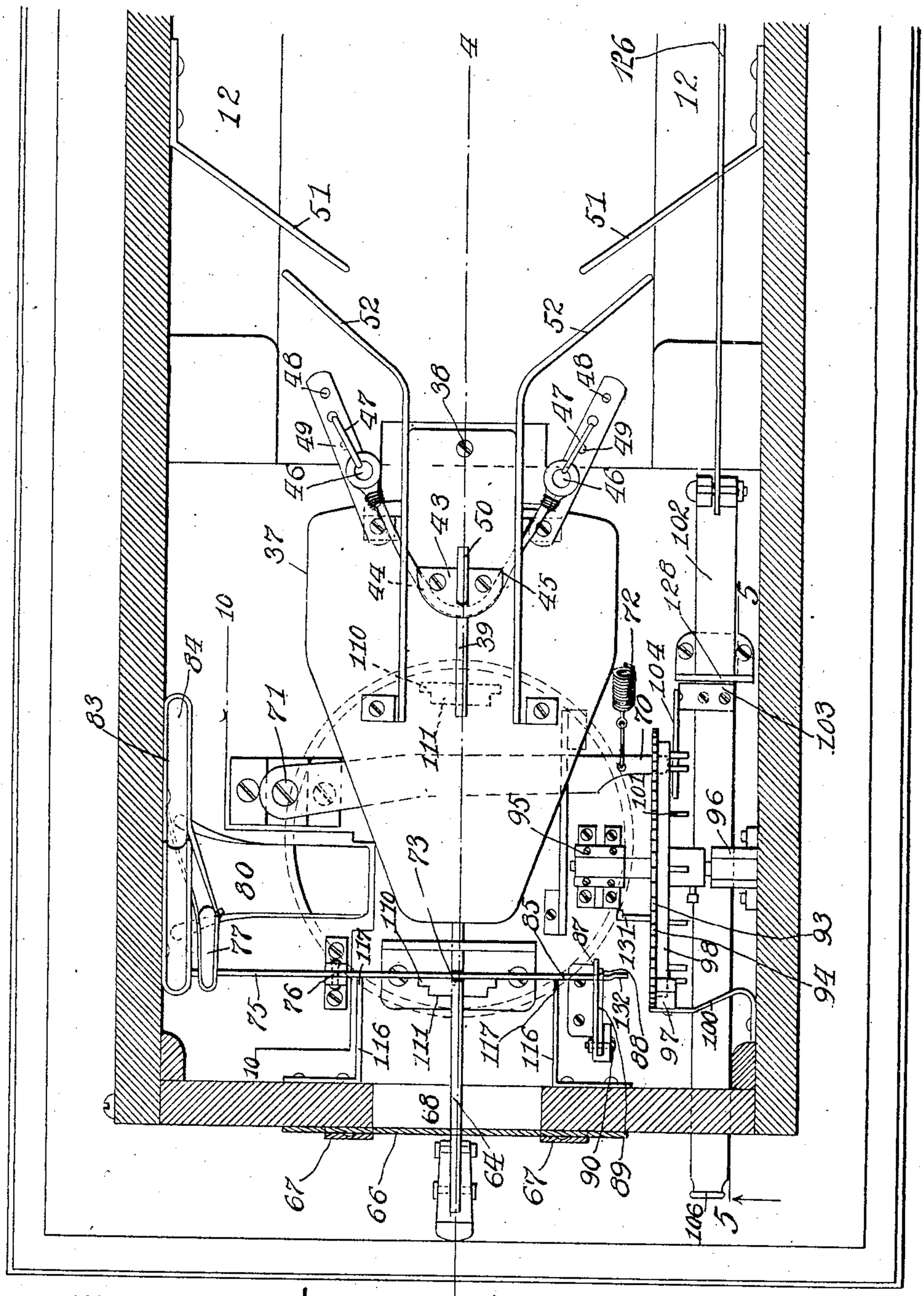
No. 785,668. PATENTED MAR. 21, 1905.

A. FERLAND.

REGISTERING MECHANISM FOR TENPIN GAMES.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 2.



Witnesses:
J. L. Kenard
F. D. Ammen

Albert Ferland, Inventor

By Marion & Marion

Attorneys

No. 785,668. PATENTED MAR. 21, 1905.

A. FERLAND.

REGISTERING MECHANISM FOR TENPIN GAMES.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 3.

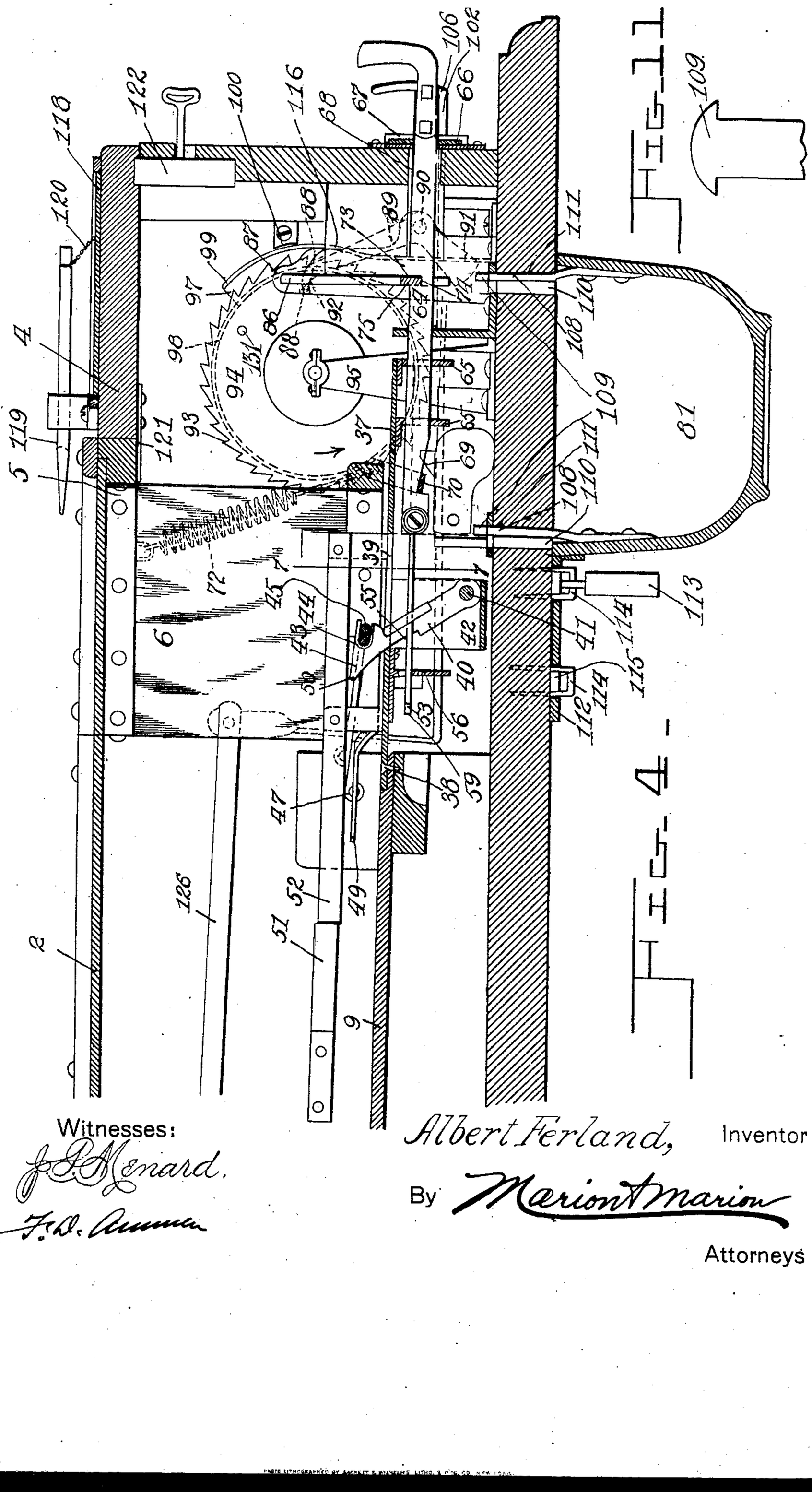


FIG. 4.

Witnesses:

J. L. Menard.

F. D. Cummins

Albert Ferland, Inventor

By Marion & Marion

Attorneys

No. 785,668. PATENTED MAR. 21, 1905.

A. FERLAND.

REGISTERING MECHANISM FOR TENPIN GAMES.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 4.

FIG. 5

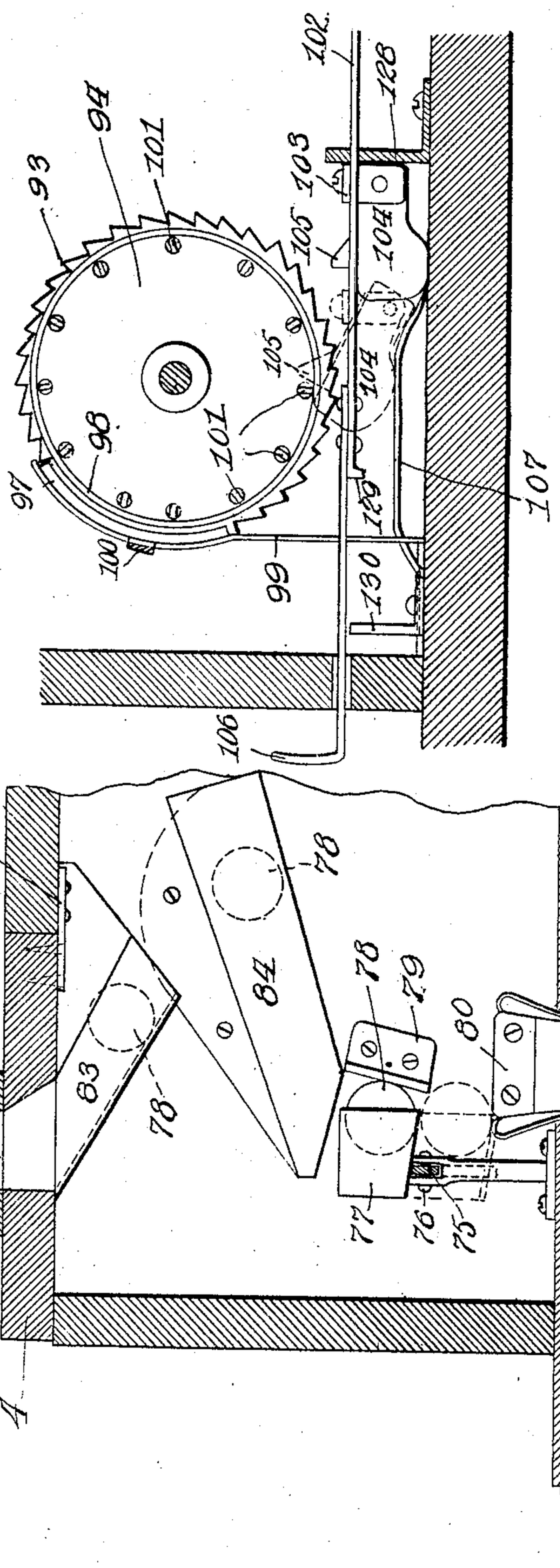


FIG. 7.

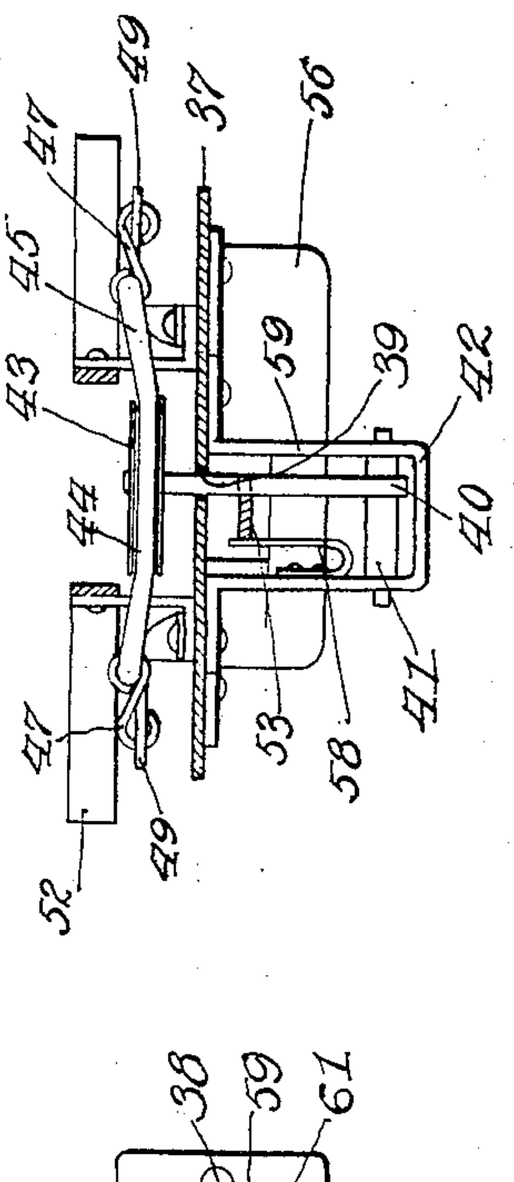


FIG. 10

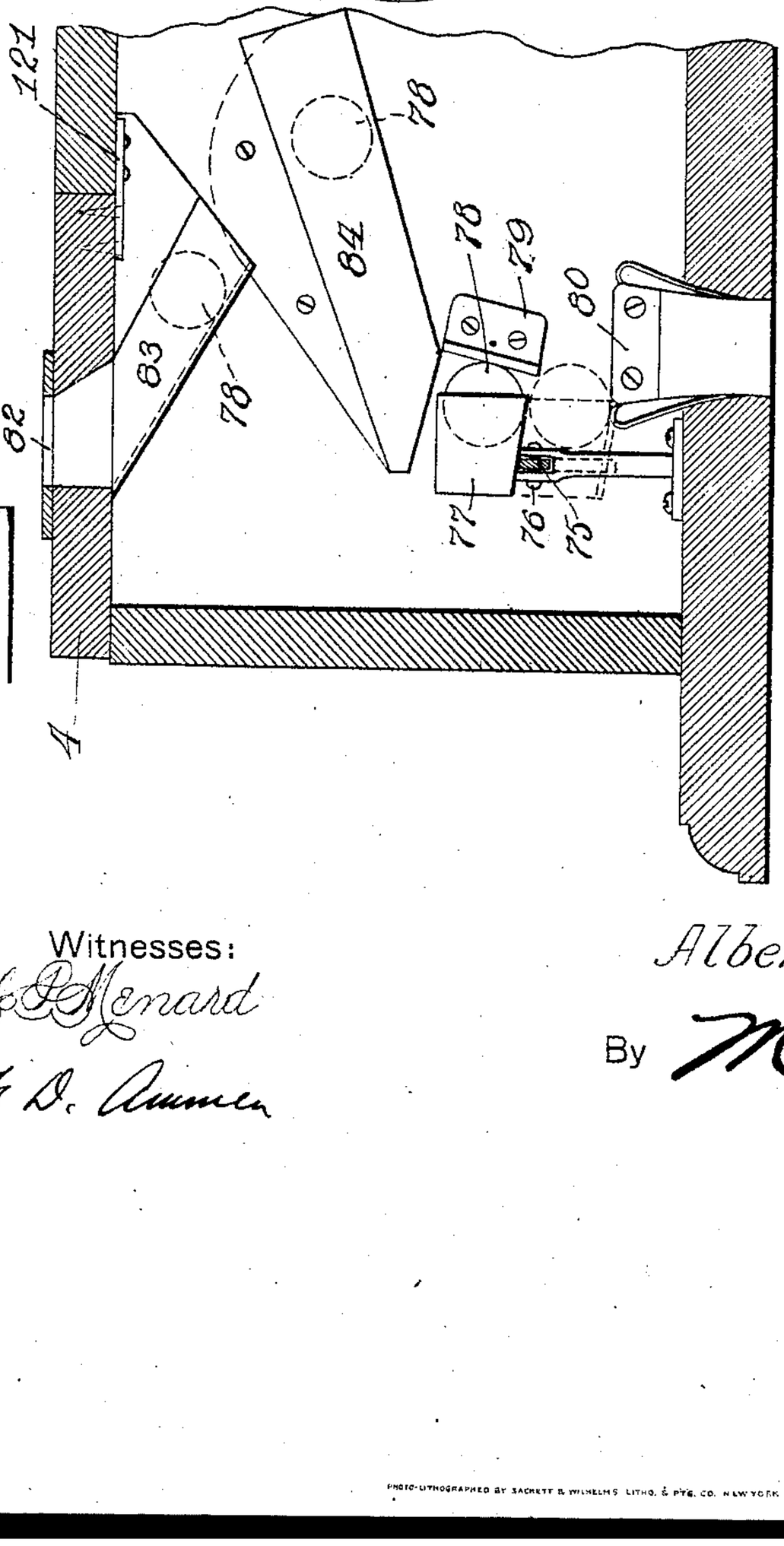
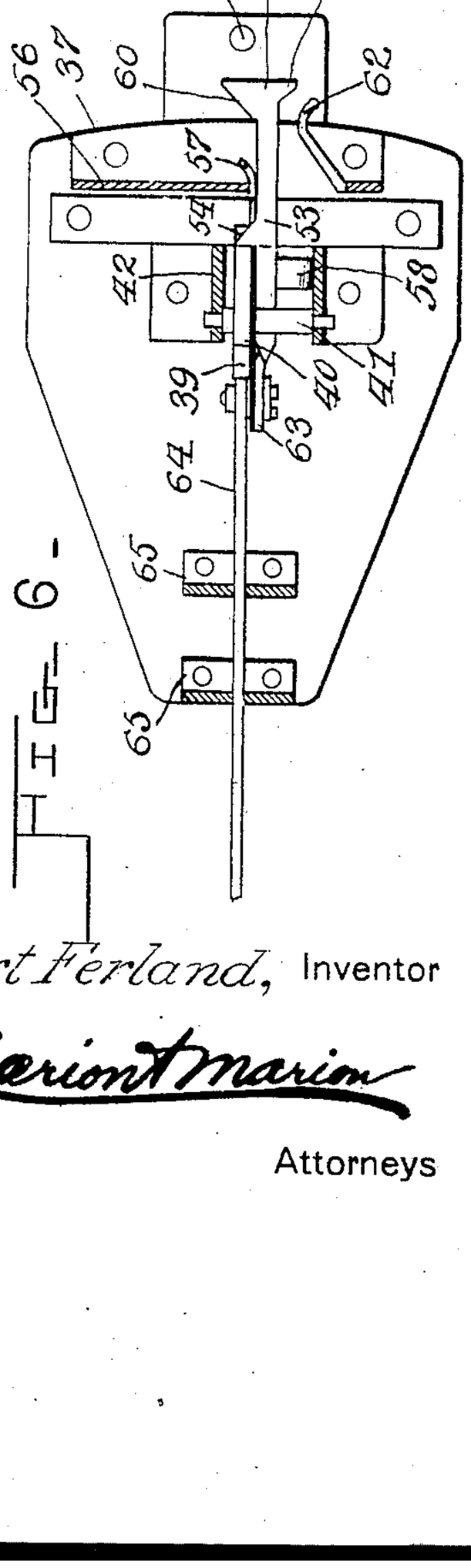


FIG. 6.



Witnesses:

F. P. Renard

F. D. Cummer

Albert Ferland, Inventor

By Marion & Marion

Attorneys

No. 785,668. PATENTED MAR. 21, 1905.

A. FERLAND.

REGISTERING MECHANISM FOR TENPIN GAMES.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 5.

FIG. 9.

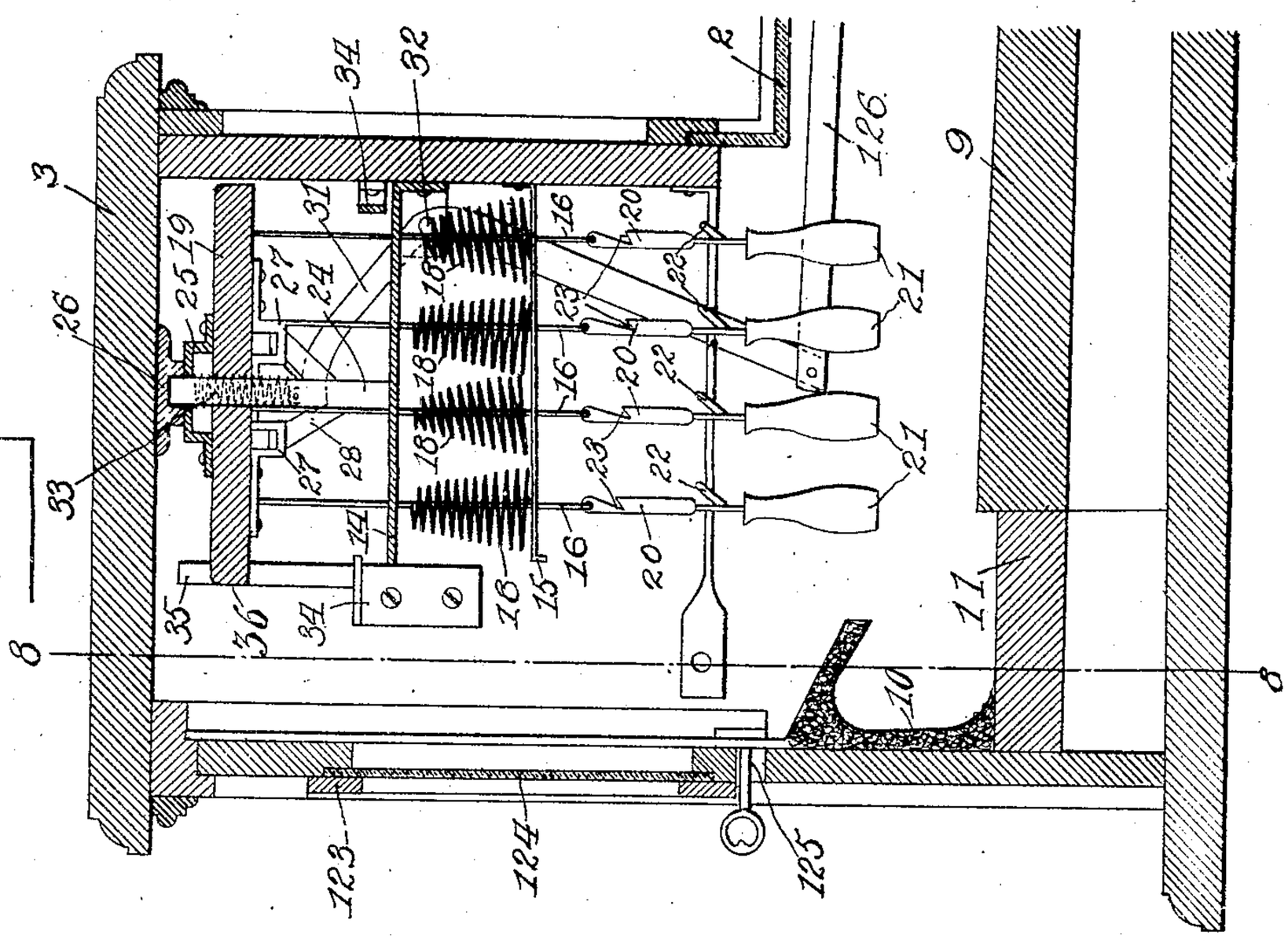
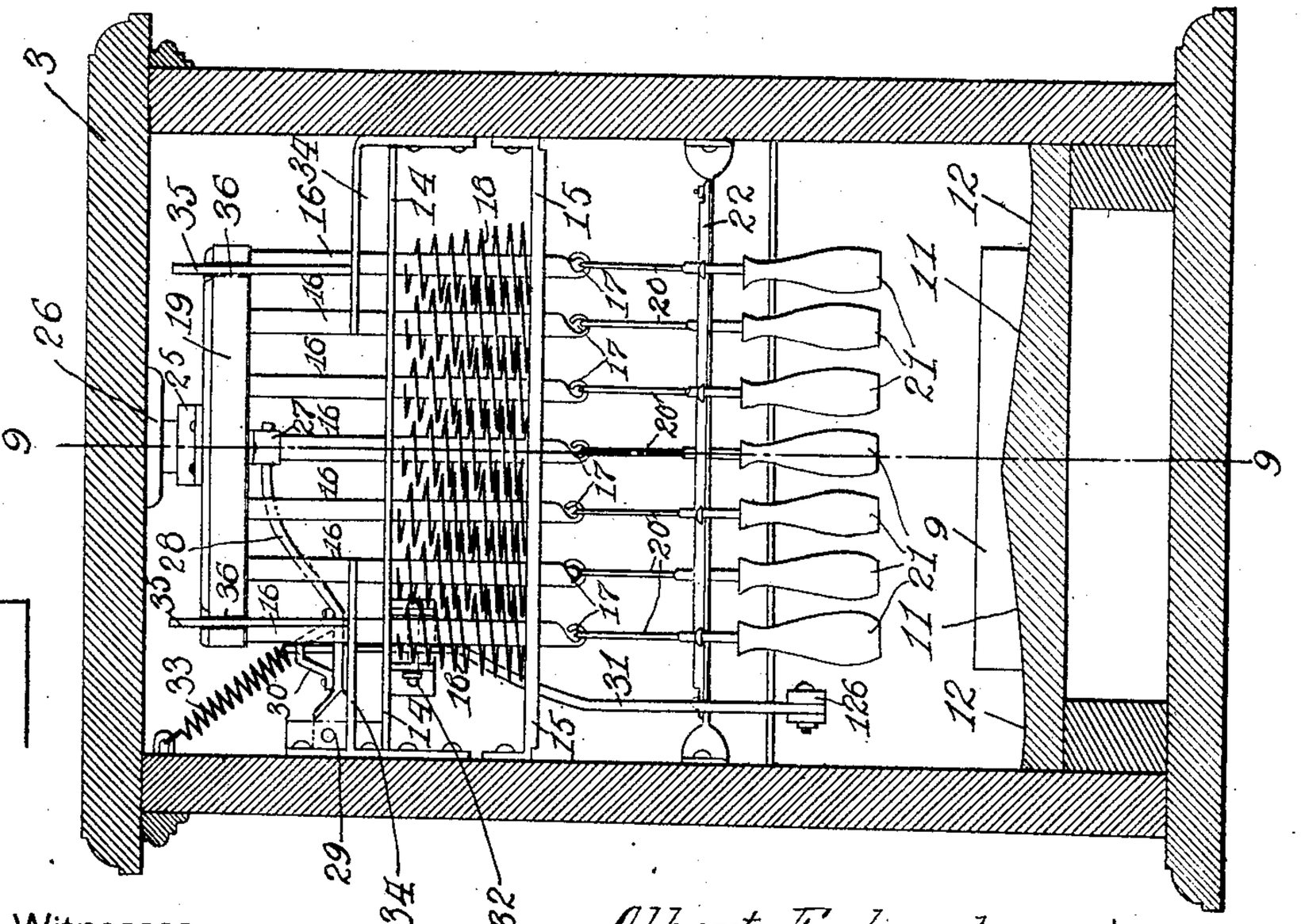


FIG. 8



Witnesses:

J. L. Menard

F. D. Ammen

Albert Ferland,

Inventor

By Marion & Marion

Attorneys

No. 785,668. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

ALBERT FERLAND, OF LAWRENCE, MASSACHUSETTS.

REGISTERING MECHANISM FOR TENPIN GAMES.

SPECIFICATION forming part of Letters Patent No. 785,668, dated March 21, 1905.

Original application filed November 10, 1902, Serial No. 130,683. Divided and this application filed November 20, 1903. Serial No. 181,936.

To all whom it may concern:

Be it known that I, ALBERT FERLAND, a citizen of the United States, residing at Lawrence, Essex county, State of Massachusetts, have invented certain new and useful Improvements in Registering Mechanism for Tenpin Games; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This application is a division of an application for a tenpin game, Serial No. 130,683, filed November 10, 1902.

The game apparatus to which my invention has been applied comprises a miniature bowling-alley consisting of an elongated body supported above the floor at a suitable height, at one extremity of which alley a pin-house is formed wherein the tenpins are arranged, in conjunction with which pin-setting mechanism is provided, enabling the pins to be set up from the player's position at the opposite extremity of the alley. At the player's position, which is called the "upper" end of the alley, there is provided suitable sling mechanism for the purpose of projecting a ball down the alley, aimed at the pin. Arrangement is made whereby the sling mechanism is normally in a locked condition, so that it cannot be used; but the said mechanism is adapted to be released by means of a coin of a certain denomination, which would be inserted in the slot provided therefor.

The object of this invention is to provide means for registering each shot or play, so that a predetermined number of shots may be had by the players for each coin inserted in the machine. The registering mechanism, by means of which the desired results are attained, is complicated by the requirements of the game, it being understood that the rules of play with this game apparatus are substantially the same as those in ordinary bowling-alleys. The registering mechanism comprises an arrangement whereby the same will be effected not only by the discharge of the ball down the alley, but also by the act of resetting the pins after each player's turn.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

In the drawings, which fully illustrate my invention, Figure 1 is a perspective representing an alley to which the present invention has been applied. Fig. 2 is substantially a longitudinal section through the body of the alley, certain portions being shown in elevation. Fig. 3 is a sectional plan through the alley above the sling mechanism and exposing the other mechanism contiguous to it. Fig. 4 is a vertical section taken substantially on the line 4 4 of Fig. 3. Fig. 5 is another vertical section taken substantially on the line 5 5 of Fig. 3. Fig. 6 is a bottom plan of a sling-plate used in connection with my invention, some parts being shown in section, as will appear. Fig. 7 is a vertical section showing a portion of the apparatus and taken substantially on the line 7 7 of Fig. 4. Fig. 8 is a vertical section taken at the pin-house at the lower end of the alley, this section being taken substantially on the line 8 8 of Fig. 9. Fig. 9 is a section at this point, but in a plane at right angles, and is taken substantially on the line 9 9 of Fig. 8. Fig. 10 is a vertical section taken substantially on the line 10 10 of Fig. 3. Fig. 11 is a side elevation of the head of the coin-cup handles.

Throughout the drawings and specification the same numerals of reference denote like parts.

Referring to the parts by numerals, 1 represents the body of the alley, which consists of a substantially rectangular box, which is open above and covered with a sheet of glass 2. At its farther extremity there is provided a superstructure or box 3, which I shall call the "pin-house," because it contains the tenpins and the mechanism immediately connected with them. At the head of the alley or its near extremity there is provided a cover plate or board 4, at the forward edge of which there is formed a deep and wide notch 5, which notch is located just above the mechanism for aiming and projecting the ball, so that the same is clearly visible through the glass cov-

ering 2, a suitable cloth screen 6 being arranged at this point for hiding the unsightly mechanism beneath the plate 4.

The alley is suitably supported in a horizontal position upon proper standards 7, which may be connected by suitable braces 8, as indicated.

The construction of the body of the alley and the framework are most clearly shown in Fig. 2. It comprises a false bottom or main floor 9, which inclines upwardly slightly from the player's position toward the pin-house, and beyond it the rear wall of the pin-house is provided with a suitable back-stop or buffer 10, adapted to arrest the flight of the ball, there being a depressed floor 11 in front of this buffer, which inclines downwardly toward each side, as clearly shown in Fig. 8, for the purpose of deflecting the ball toward one side or the other, whereupon the ball will be returned to the player's position down either of the inclined runways 12 upon either side of the main floor 9 of the alley.

Before proceeding to a description of the pin-setting mechanism it may be said that the pins when the play is about to take place are suspended immediately above the alley-floor 9, as shown in Fig. 2, and when any one of them is struck by the ball 13 it is drawn up automatically into an elevated position, in which position all of the pins are shown in Figs. 8 and 9. The setting mechanism affords means for returning all withdrawn or elevated pins to the "set" position, in which they are shown in Fig. 2. The mechanism for effecting these results comprises substantially horizontal guide-plates 14 and 15, mounted within the pin-house and through which are vertically-guided tenpin-holders 16. These pin-holders consist substantially of flat metallic strips or bars provided at their lower extremities with hooks 17, as shown. Coil-springs 18 constrain these pin-holders upwardly, so that their upper extremities abut against the lower side of a vertically-movable setting-plate 19. The hooks 17 support, respectively, pin-hangers 20, which carry below them rigidly the tenpins 21, as shown. It should be said at this point that the tenpins are arranged as in playing the game upon standard bowling-alleys. Immediately in front of the pin-hangers 20 are mounted inclined locking-plates 22, which extend across each row or phalanx of the pins, and the hangers 20 are provided with notches 23, which when sufficiently depressed are adapted to be engaged by the locking-plates 22, so as to maintain the pins in the depressed position in which they are shown in Fig. 2. It should be understood that depressing the plate 19 effects this locking or setting of the pins. A central vertical guide 24 is provided for this plate, the plate being provided with a guide-bracket 25, secured above it, as indicated, the guide 24 being suitably mounted in a plate 26, as shown. Upon the lower face of the setting-plate 19 are mounted two yokes or stirrups 27, which receive the bifurcated extremity of a lever 28, constructed substantially as shown and pivoted as indicated at 29. This lever is itself provided with a yoke 30, which receives the extremity of a bell-crank lever 31, pivoted at 32, and a helical spring 33 normally maintains this lever in the position in which it is shown in Fig. 9, which operates to maintain the setting-plate 19 normally elevated. At each side are provided bracket-plates 34, the horizontal portions of which constitute stops to limit the downward movement of the setting-plate 19, and these brackets are provided with substantially vertical extensions 35 adjacent to the faces 36 of the setting-plate, which prevent any rotation of the same upon the aforesaid vertical guide 24. When the pins have been set and are in the position in which they are shown in Fig. 2, if any one of the pins were moved rearwardly, as it could be by the moving ball, the notch 23 corresponding to that pin is released, and its spring 18 immediately withdraws it or elevates it out of reach of the ball. In this manner the struck pin or "dead-wood" is cleared away for the next shot.

I shall now describe the sling mechanism and will refer specially to Figs. 3, 4, 6, and 7. This mechanism comprises a substantially horizontal sling-plate 37, shaped substantially as shown in Fig. 3 and pivoted at 38 so that it may be given a limited rotation in a horizontal plane. It is provided with a longitudinal slot 39, through which passes a trigger or lever 40, which is pivoted at 41 to a bracket 42, carried by the lower side of the plate 37. This trigger is formed above into a head 43, having a semicylindrical groove 44, which receives an elastic cord or spring 45, the extremities of which cord 45 diverge, as indicated, and connect with rings 46, which rings in turn attach to hooks 47, and these hooks may be held in any one of a plurality of openings 48, formed in the forwardly-projecting horns 49. The trigger 40 terminates above in a tip 50, which is adapted to rest against the ball 13, and it should appear that if the trigger 40 were drawn back and released it would operate to project the ball down the alley. For the purpose of guiding the ball back into the sling when it returns the side of the alley is provided with inclined guide-brackets 51, behind which are arranged diverging guide-brackets 52, which latter are attached to the sling-plate 37.

For operating the sling a catch 53 is provided, which is substantially horizontal and provided with a laterally-projecting tooth 54, which tooth normally engages with the forward edge 55 of the trigger 40. This catch 53 passes through a guide-bracket 56, secured to the lower side of plate 37, and one side of the catch is normally pressed against the in-

clined lip 57 by a suitable spring 58. The catch 53 is provided with a head 59, having an inclined face 60, which as the catch 53 is drawn rearwardly engages with the lip 57, displacing the catch 53 laterally, so that the tooth 54 becomes disengaged from the trigger 40. When the catch 53 is returned, as it is automatically, the heel 61 engages the lip 62, which replaces it in its normal position. It should be observed that sufficient play should be allowed at the point 63 to effect these movements. At this point a suitable bar 64 is attached, which passes through guide-brackets 65 and through a plate 66, which is slidably mounted upon the front of the alley in a suitable bracket 67. A long opening 68 is provided in the front of the alley, so as to permit the pull-bar 64 to be moved laterally in order to rotate the sling-plate about its pivot 38 for the purpose of aiming before firing.

The pull-bar 64 is provided on its lower edge with an inclined notch 69, which receives a tongue or lever 70, pivoted at 71, and which projects transversely of the alley and to which is attached near its extremity a spring 72, which operates to maintain the said pull-bar 64 normally in its innermost position. This lever 70 has other functions, which will be described in connection with the counting mechanism. The upper edge of the pull-bar 64 is provided with a projection 73, which constitutes a stop to limit its rearward movement, and there is also provided in the upper edge a notch 74, which notch is normally in engagement with a locking-bar 75, which extends transversely of the alley.

I shall now describe the coin-releasing mechanism. This comprises the locking-bar 75, to which reference has just been made in the preceding paragraph. It is pivoted at 76, and at one extremity it is formed into a pocket 77, which may receive a coin 78, which operates to depress that end of the lever, as will be readily understood, until it has descended sufficiently to allow the coin to pass below the release-plate 79, whereupon the coin is discharged into a chute 80 and eventually finds its way to the coin-cup 81. A suitable opening 82 is provided for introducing the coin into the alley, which passes successively down oppositely-inclined guides 83 84, provided to prevent fraudulent operation of the mechanism.

The extremity 85 of the locking-bar 75 passes through a substantially vertical slot 86, formed in a bracket 87. Near its upper extremity this bracket is provided with a lateral projection 88, against which abuts the extremity of a lever 89, pivoted at 90, which lever is maintained normally in this position by a counterweight 91, which may be integral therewith, as indicated. When the extremity 85 is elevated, as it is by the coin, it engages the inclined edge 92, displacing the lever 89, so that said extremity 85 passes into the portion of the slot 86 lying above the lever, whereupon the lever 89 returns into its normal position and maintains the locking-bar 75 in this abnormal position. The pull-bar 64 is now released, and the game may be played.

Proceeding now to a description of the counting mechanism, it should appear that the extremity of the aforesaid lever 70 curves upwardly and engages with the teeth 93 of a ratchet-wheel 94, which ratchet-wheel is mounted between a suitable floor-bracket 95 and wall-bracket 96. There are just thirty-six teeth upon the periphery of this ratchet-wheel, and the proportion of the mechanism is such that whenever the pull-bar 64 is drawn back until the stop 73 strikes the ratchet-wheel 94 will be advanced just one tooth-space. A brake 97, which engages with a cylindrical flange 98 upon the ratchet-wheel, offers a suitable resistance to the rotation of the ratchet-wheel, this brake being carried upon spring-brackets 99 and 100. In playing this game each player is ordinarily allowed three shots in succession, whereupon he records his score. Then his opponent takes a similar turn. However, where all the pins are knocked down or caused to be withdrawn with the first ball what is known as a "strike" occurs, and in playing this game the lucky player is awarded thirty points conditionally, which he records in the proper box. Taking this one shot of course only advances the ratchet-wheel 94 through one tooth-space; but I provide mechanism for effecting the complementary movement of two tooth-spaces, so that the ratchet-wheel is moved eventually as though the player had shot three consecutive times. To this end the ratchet-wheel 94 is provided with twelve laterally-projecting pins 101, and the pin-setting link 102 has a vertical extension, to which is attached a link 126, connecting it with the lever 31 for the purpose of setting the pins. The member 102 also is provided with a bracket 103 adjacent to the ratchet-wheel 94, to which bracket is pivoted a plate 104, provided with an upwardly-projecting tooth 105. A suitable handle 106 is formed at the extremity of the setting-link 102, and when this handle is drawn outwardly the plate 104 rides up upon a guide-plate 107, as shown in Fig. 5, so that the tooth 105 is projected into the path of the laterally-projecting pins 101. This movement of the plate 104 advances the ratchet-wheel 94 whatever amount is necessary to make up the three-tooth-space movement corresponding to three shots. Supposing that the player made what is known as a "spare"—that is, suppose that he "knocked down" all the pins with two balls—he would then be awarded twenty points conditionally, the ratchet-wheel 94 will have been advanced through two tooth-spaces, and the resetting of the pins would operate only to advance the ratchet-wheel through the remaining tooth-space, making up the three tooth-spaces cor-

responding to the turn of the player. From this arrangement it will be evident that after each player's turn, whether he has rolled one ball or three, the ratchet-wheel 94 will have been advanced through just three tooth-spaces and where the player made either a strike or a spare the resetting of the pins will operate automatically to effect a complimentary rotation of the ratchet-wheel, so that it is moved in any case through three tooth-spaces before the next player's turn.

The coin-cup 81 attaches to the lower side of the alley in proper position below the chute 80. It is provided on its inner side with diametrically opposite handles 108, which project upwardly, terminating above in overhanging heads 109. These heads pass upwardly through slots 110, whereupon they are moved laterally into narrower portions 111 of the slots, so that the overhanging heads are supported and the cup may not be drawn downwardly, as will be readily understood. When the cup has been so placed, a short bar 112 is held against one of its sides, which bar is secured in place by a suitable padlock 113, a staple 114 projecting through an opening 115 in the body of this bar to prevent its being moved laterally, so that the cup may not be robbed of its contents.

As the locking-bar 75 is comparatively light, it might not be effective in preventing the withdrawal of the pull-bar 64. To prevent its destruction, there are provided two brackets 116, which project inwardly from the front board of the alley, so that their vertical front edges 117 act as braces for the locking-bar.

The top board 4, which has already been referred to, is provided with a small tablet or slate 118, upon which may be recorded the scores made by the players with a suitable pencil 119, carried on a chain 120. This top board 4 may be removed to inspect the mechanism, it being removably held in place by cleats 121 and a suitable lock 122.

The rear of the pin-house may be provided for a similar purpose with a removable door 123, carrying a glass plate 124, and which may be held in place by a suitable lock 125.

Suitable guide-brackets 127 128 are provided along the alley and near the inner end of the alley, respectively, for guiding the pin-setting links. The members 106 and 102 overlap each other, as shown, so that the extremity of the member 102 forms a shoulder 129, which is adapted to abut against a stop-bracket 130 to limit the movement of the handle 106.

In order to release the locking-bar 75 to allow the same to fall again into the notch 74, locking the sling mechanism, the ratchet-wheel 94 is provided with a laterally-projecting pin 131, which when the ratchet-wheel has completed one revolution engages with a lateral projection 132, which is carried by the upper extremity of the aforesaid lever 89. This removes the lever 89, so that the locking-bar 75 is unsupported, wherefore it falls by its own weight into the notch 74. The machine is now locked, and a game can only be played with it by inserting the proper coin at the slot 82.

Briefly outlining the mode of operation of this machine, it may be said that the pins are normally maintained suspended in a depressed position, in which position they are shown in Fig. 2, the notches 23 then being in engagement with the members 22. When the ball strikes any one of these pins, it is released and is drawn upwardly to its extreme elevated position by means of its corresponding spring 18. The pins may be reset by pulling upon the handle 106, which operates, through the link 126, to move the bell-crank lever 31, which operates in turn to depress the setting-plate 19. The lower side of this setting-plate rests upon the members 16, which it depresses in unison sufficiently for the notches 23 to engage, respectively, with the members 22. The ball is projected by means of the trigger 40 and an elastic cord 45, this trigger being drawn back by a pull-bar 64, which has attached to its extremity a catch 53, a tooth 54 of which engages with the trigger. As it is withdrawn the catch 53 is deflected by means of the lip 57, so as to release the trigger, and upon its return the catch 53 is replaced in its normal position by means of the inclined face 62. Each time the sling is extended the ratchet-wheel 94 is advanced through one tooth-space by means of the lever 70. If, however, less than three shots have been fired, when the ten-pins are reset by means of the handle 106 the plate 104 engages one of the pins 101 and advances the ratchet-wheel a complementary amount, sufficient to make its total advance for that time just three tooth-spaces. The plate 104 is provided with a tooth 105 for this purpose and as it advances rides up upon a guide-plate 107, which projects the tooth 105 into the path of the pins 101. The member 64 is normally locked against movement by means of the locking-bar 75, which engages with the recess or notch 74. When a coin is inserted, however, in the slot 82, it finds its way into the pocket 77, carried upon the locking-bar 75, and this operates to elevate the extremity 85 of the locking-bar. This extremity 85 passes through a slot 86 in a vertical bracket 87 and as it moves upwardly it throws a lever 89 out of its path, which lever soon returns into its normal position, maintaining the locking-bar 75 in this abnormal and elevated position. The play now continues until the ratchet-wheel 94 has made one complete revolution, whereupon the pin 131, which it carries, comes into engagement with the lateral projection 132, carried by the aforesaid lever 89. This displaces the lever, so as to allow the locking-bar to fall by its own weight and lock the mechanism against further

play. The spring 72 operates not only to maintain the lever 70 in engagement with the teeth 93 of the ratchet-wheel, but also operates to return the pull-bar 64 to its normal inward position.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a tenpin game apparatus, in combination, an alley, a sling adapted to project a ball down said alley, a rotatable member, means whereby the operation of said sling will advance said rotatable member, means for resetting the pins, mechanism whereby said last means may also advance said rotatable member, and means whereby a predetermined advance of said rotatable member may lock said sling against further operation.

2. In a tenpin game apparatus, in combination, an alley, a sling adapted to project a ball down said alley, a rotatable member, means for resetting the pins collectively, means actuated by said sling for advancing said rotatable member a definite amount for each shot, and mechanism connected with said resetting mechanism adapted to advance said rotatable member a predetermined complementary amount.

3. In a tenpin game apparatus, the combination of an alley, ball-projecting mechanism, a rotatable member, actuating mechanism connecting said ball-projecting mechanism with said rotatable member, means for locking the ball-projecting mechanism, means for resetting the pins collectively, means actuated by the ball-projecting mechanism for advancing said rotatable member a definite amount for each shot, and means connected with the resetting mechanism for advancing said rotatable member a predetermined complementary amount.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALBERT FERLAND.

Witnesses:

FELIX ROBIDAUX,

JOSEPH LANDRY.