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Patented Apr. 11, 1899.

P. C. BIRSACH.
BOWLING ALLEY.

(Application filed Jan. 11, 1898.)

(No Model.)

2 Sheets—Sheet 1.

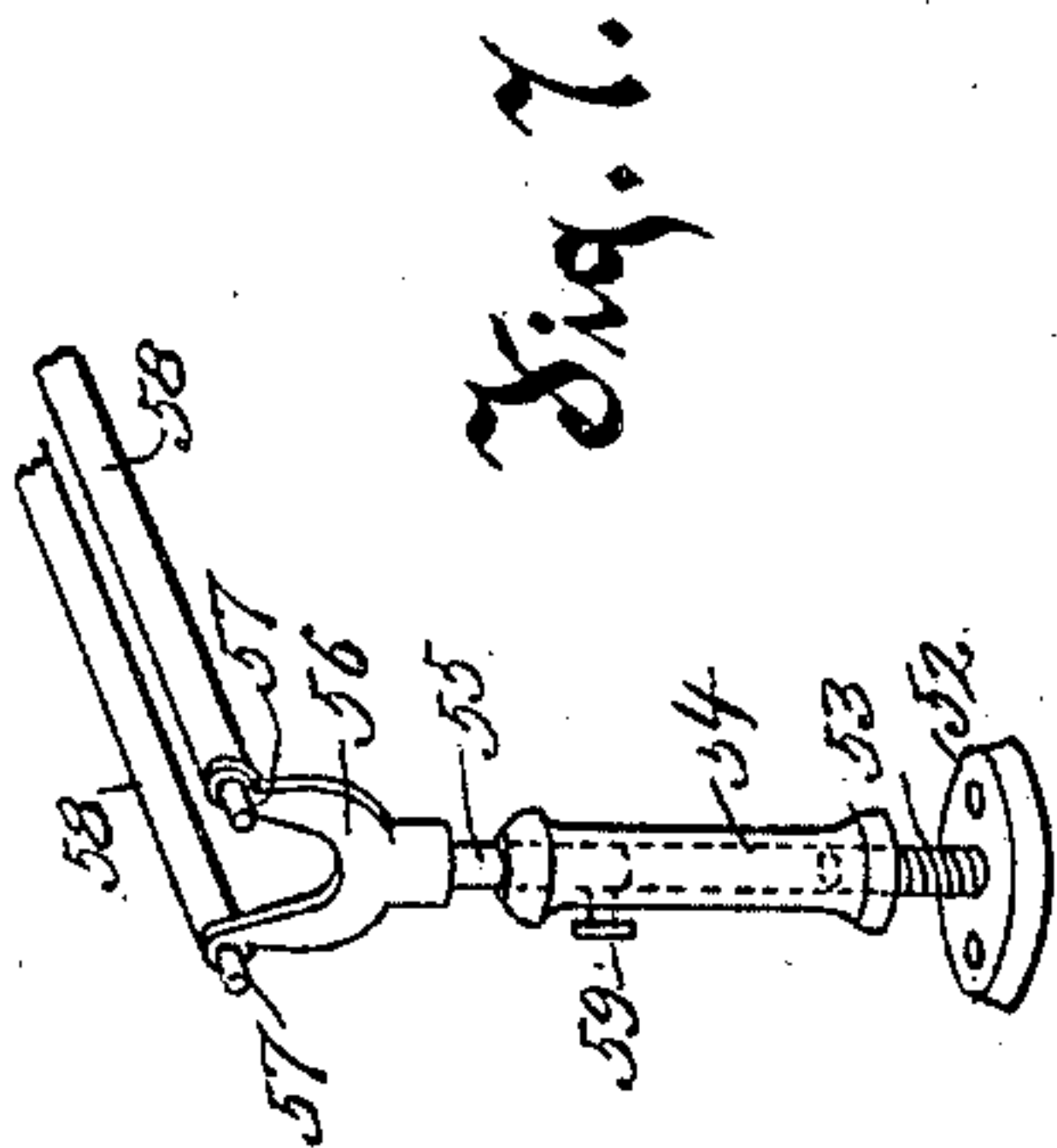
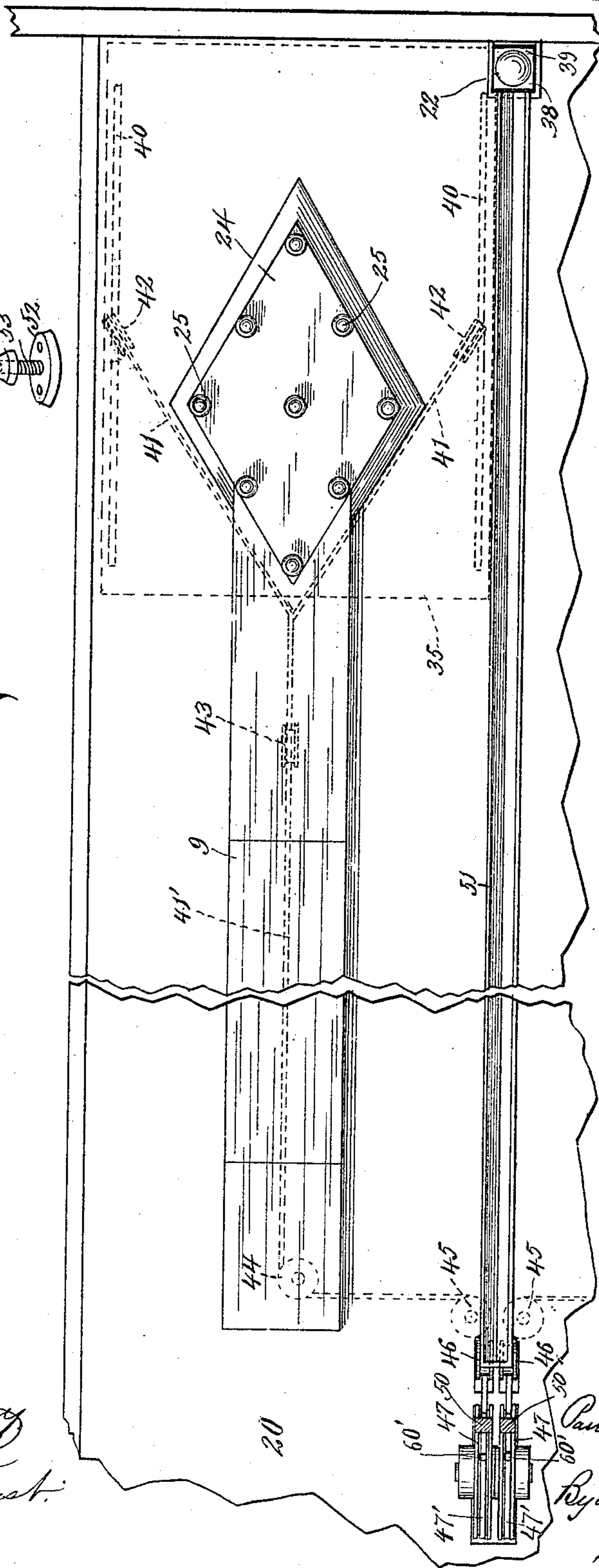


Fig. 7.

Fig. 1.



Witnesses.

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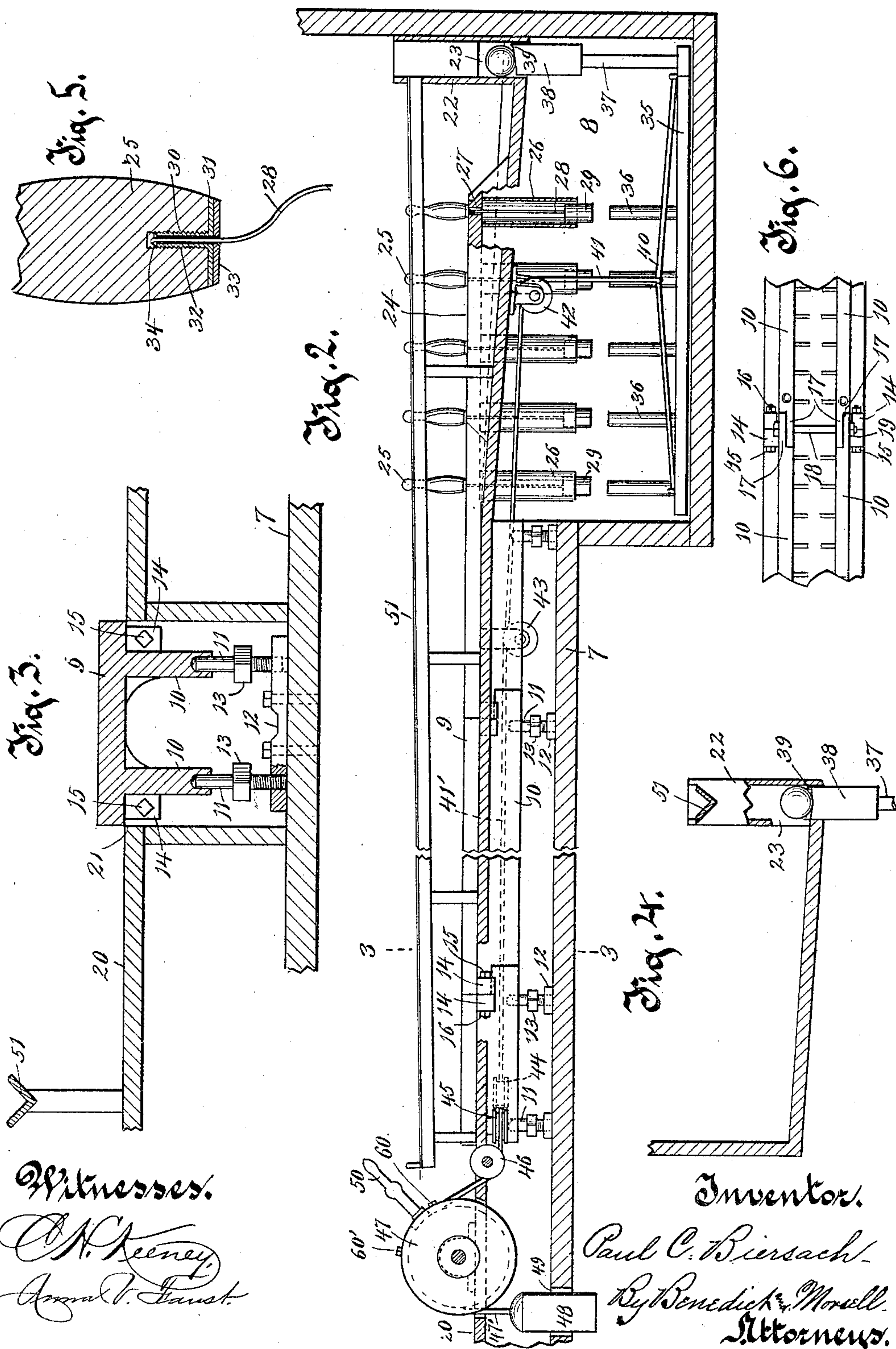
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

PAUL C. BIRSACH, OF MILWAUKEE, WISCONSIN.

BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 622,660, dated April 11, 1899.

Application filed January 11, 1898. Serial No. 666,340. (No model.)

To all whom it may concern:

Be it known that I, PAUL C. BIRSACH, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Bowling-Alleys, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in bowling-alleys.

The invention contemplates as an object an improved means for resetting the pins in an upright position after the same have been knocked down, the mechanism for this purpose being capable of being operated in a most simple manner and said mechanism also dispensing entirely with the necessity of the services of alley-boys at the rear end of the alley.

A still further object contemplated is the provision of an improved means in a bed composed of a plurality of sections for connecting said sections together.

With the above primary and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a plan view of a fragment of a bowling-alley embodying my improvements, showing certain parts in dotted lines. Fig. 2 is a longitudinal sectional view taken on a plane to one side of the central ball-bed, parts being broken away and in section and showing the lever as thrust forwardly and the movable platform in its lowermost position and the pins in their upright position. Fig. 3 is a cross-section on the line 3 3 of Fig. 2. Fig. 4 is a transverse section of the alley at the rear thereof just in advance of the ball pit or casing, one side of said ball-pit being shown as broken away. Fig. 5 is a sectional view through a fragment of one of the pins. Fig. 6 is an inverted plan view of a fragment of the bed for the balls, and Fig. 7 is a detail of a modified form of ball-trough.

Referring to the drawings, the numeral 7 indicates a lower platform or flooring, the rear end of which extends to and connects with the front wall of a rear chamber 8. Arranged a desired distance above the flooring

7 is a bed 9, preferably of metal, upon which the balls which are thrown or impelled are adapted to travel. Bowling-alleys are of considerable length, and hence it is advisable and desirable to construct this bed 9 of a plurality of sections, as clearly shown in the drawings. In order to strengthen the bed or the sections thereof when the bed is composed of sections and to likewise prevent warping, I prefer to form on the under side of the bed ribs similar to 10, which ribs extend downwardly for a desired distance. The upper ends of adjusting-bolts 11 engage sockets in the lower ends of these ribs 10, while the lower threaded ends of said bolts engage threaded sockets in a cross-tie 12, said tie being firmly secured to the platform or flooring 7 by suitable bolts or any other desirable securing means. It is of course obvious that if preferred the tie 12 might be dispensed with and the adjusting-bolts extended directly into the platform or flooring 7; also, where the depending ribs 10 are not provided the bolts might extend upwardly into sockets formed on the under side of the bed. Each bolt is formed or provided at a medial point with a fixed enlargement 13, which is advantageously provided with a plurality of sides, so as to be of hexagonal or other desirable form in order to be readily engaged by a wrench or other suitable turning-tool. It is obvious that by properly turning the adjusting-bolts the bed may be readily raised or lowered, as desired. Where the bed is composed of a number of sections, as shown in the accompanying drawings, each section should be provided with a set of these adjusting-bolts. It will be apparent that my improved provision for adjusting the bed is of the greatest utility in this class of devices, inasmuch as the proper level of the bed can at all times be obtained with but the slightest trouble and loss of time.

In a sectional bed such as shown in the accompanying drawings provision of course must necessarily be provided for securing the adjacent ends of the sections together. For this purpose I form on the under side of each section at opposite ends of said section and at or near opposite side edges at each end the lugs 14 14, which fit against corresponding

lugs at the ends of the adjacent sections. These lugs are united and held together by means of headed bolts 15, extending longitudinally of the bed and passing through the lugs, which bolts receive locking-nuts 16 on their threaded ends. I also provide an additional means for securing the sections together by forming the ends of the ribs 10 (see Fig. 6) with angle-notches, which form tongues 17, said tongues matching and fitting each other side to side. These tongues are secured together by means of a transverse headed bolt 18, extending beneath the bed and passing through the tongues. The threaded ends of these bolts receive locking-nuts 19. By the described arrangement for holding the sections together said sections are secured in such manner as to be effectually prevented from separating either longitudinally or laterally, and the securing means are obscured from view, and at the same time said securing means are readily accessible for the purpose of disconnecting the sections whenever this is found necessary.

Above the platform or flooring 7 is the main flooring or platform 20 of the alley, at the forward end of which the player stands in order to throw the ball along the bed 9. This platform is provided for a desirable distance with a longitudinal opening 21, which is of sufficient width and length to accommodate therein the bed 9. By the provision of this opening there is of course no obstruction afforded by the platform 20 to the vertical adjustment of the bed 9. Said bed normally stands raised above the main platform about the distance shown in Fig. 3, which distance may of course be varied by the adjustable mechanism hereinbefore described. The platform 20 is on a horizontal plane for the greater portion of its length. At its rear, however, it slants downwardly both rearwardly and laterally. The rearward inclination is clearly shown in Fig. 2, while the lateral inclination is shown in Fig. 4. As will be seen from said Fig. 4, the lateral inclination is toward a ball pit or casing 22, which ball pit or casing is provided at its lower end in its inner side with a ball-opening 23. The bed 9 terminates at or near the point where the inclination of the platform 20 begins, and at this point said bed communicates with the portion 24, on which the pins 25 are set. The portion 24 while resting and supported on the inclined platform 20 is yet gradually raised toward its rear and also toward one side, so as to bring it on the same plane with the bed 9.

Extending downwardly from the portion 24 into the chamber 8 are a series of tubes 26, there being one of said tubes for each pin employed. Each of these tubes is located directly beneath an opening 27 in the portion 24. Each pin has secured to its under side a cord 28, which passes through its opening 27 into its tube 26 and has secured to its lower end a weight 29. The length of each cord is

so regulated that when the pin is in an upright position the upper portion of the weight will extend into the tube. Each tube therefore serves as a guide for the up-and-down movement of the weight therein.

Fig. 5 shows the preferable means for securing the cord to the pin. It will be noticed that the pin has extending upwardly from its bottom a threaded socket 30. The numeral 31 indicates a plate which is formed or provided with an upwardly-extending tube 32, which is exteriorly threaded and is adapted to fit the threaded socket 30. Fitted to the plate 31 is a rubber disk or cushion 33. The cord 28 passes through registering openings in the disk 33 and plate 31, thence upwardly through the tube 32, and is connected at its upper extremity to a button 34, which extends transversely over the upper end of the tube. By this construction it will be seen that a simple means is provided for attaching the cord to the pin, and the mechanism thereof is readily secured to or removed from the pin. The rubber cushion 33, adjacent to the metallic plate 31, forms a yielding or soft surface against which the balls may strike if the pin is knocked down. This prevents the ball from being bruised or indented.

In the bottom of the chamber 8 is a movable platform 35, which is provided with a series of upwardly-extending fingers 36, which are located directly beneath the tubes 26 and are adapted when the platform is raised to engage the weights 29 and force said weights upwardly into the tubes. The movable platform is also provided at one corner with an upwardly-extending arm 37, which at its upper end is provided with an enlargement or head 38. This enlargement or head is adapted to extend up into the open bottom of the ball pit or casing 22 and to receive a ball thereon as said ball rolls through the opening 23 into the ball pit or casing. The rear edge of the upper surface of this enlargement or head is formed with an upwardly-extending shoulder 39, which tends to thrust the ball off the inclined surface of the enlargement or head 38 and out of the ball pit or casing when the head or enlargement is moved upwardly to the upper end of said ball-pit.

Secured to the platform 35 on opposite sides thereof are cords 40 40. To the centers of these cords are connected other cords 41 41. These cords extend upwardly over pulleys 42 42 and are joined just beneath the rear end of the bed 9 to a single cord 41'. The single cord 41' is now extended forwardly and over a guide-pulley 43, thence around a quartered pulley 44, thence laterally around another pulley 45, located at one side of the platform 20, thence beneath a pulley 46, which pulley has its axis at right angles to the pulley 45, and thence to and into the groove of a large pulley 47, to which it is secured. Another cord or rope 47' is secured at another point of the large pulley, and its free end carries a

weight 48, which passes through an opening 49 in the platform 7. The large pulley 47 is operated by means of a handle 50, which is secured to said pulley at a point between the points of connection of the ropes 41' and 47'. In Fig. 1 I have shown the pulleys 45, 46, and 47 duplicated and arranged side by side, and also another cord (shown in dotted lines) arranged in proper relation thereto and extending laterally from pulley 45 in a direction to be used in connection with an adjacent alley.

Leading from the upper end of the ball pit or casing 22 is a ball-trough 51, which extends forwardly on a downward incline to the forward end of the machine.

In the position of the parts shown in Fig. 2 the handle 50 is shown as thrust rearward. The handle assumes this position when thrust rearward by the hand of the operator and only retains said position so long as rearward pressure thereon is exerted. Now the moment the hand of the operator is released from the handle 50 the weight 48 will cause a pull on the cord and turn the large pulley 47 forwardly, so that the handle will be in the opposite position to that shown. The forward pulling of the cord will act to raise the movable platform 35 and bring the upwardly-extending fingers 36 into engagement with the weights 29 and move said weights upwardly in their guide-tubes 26, so that the cords 28 are thereby slackened. It is obvious that as long as the weight 48 is in this lowered position with the handle 50 thrown forwardly the platform 35 will be maintained in its upper position, with the cords attached to the pins slack and said pins in their upright position. Now when the pins are knocked down by balls propelled along the bed 9 and it is desired to reset the same the handle 50 is thrust rearward to the position shown in Fig. 2, which slackens the cords leading to the platform 35 and permits said platform to descend to the position shown in Fig. 2. The moment the upper ends of the fingers 36 are thus brought out of engagement with the weights 29 said weights will drop and set the pins in upright positions. All that is now necessary to be done is to release the handle 50 and the weight 48 will turn the pulley, and with it the handle, forwardly, when the platform will be again raised and the cords 28 slackened. The parts will then be adjusted, ready for the next operation. It will also be understood that the balls which pass off the bed 9 or off the portion 24 travel on the rear inclined part of the platform 20. As said platform is slanted both rearwardly and laterally, the lateral inclination being toward the ball-pit 22, said balls are necessarily converged to the corner where the pit is located and pass through the opening 23, and each ball is supported on the head or enlargement 38 of the upwardly-extending arm 37. It will be understood, of course, that as the platform 35 is raised in the manner hereinbefore pointed out the en-

largement moves upwardly in the pit 22, and when the upper inclined surface of the enlargement becomes flush with the upper end of the pit the ball rolls off the inclined surface of the enlargement into the trough 51 and is returned to the forward end of the alley.

In Fig. 7 of the drawings I have shown a somewhat-modified form of ball-trough, in which provision is made for adjusting the inclination of said trough. Bolted to the flooring at suitable distances apart are plates 52, and extending up from each of these plates is a screw-threaded stem 53. This stem is adapted to receive the lower end of a sleeve 54. This sleeve is adapted to be screwed down so as to bear against the plate. In Fig. 7, however, it is shown as turned up merely to disclose the threaded stem. Into the upper end of this sleeve is adapted to be inserted a depending stem 55 from a yoke 56. The upper end of the arms of this yoke each have lugs 57 extending from opposite sides thereof. Fitted onto the ends of these lugs, so as to be readily removable therefrom, are tubes 58, extending from one yoke-arm to the arm of the next yoke of the series. The depending stem of the yoke is held adjustably in the sleeve by means of a set-screw 59. By loosening this set-screw it will be apparent that the yoke may be raised or lowered to any desired extent, and when the proper pitch is secured the screw is again tightened. This form of trough is more especially intended for use in alleys in which it is necessary at times to remove the trough and use the hall for other purposes.

While I have shown in the accompanying illustrations of my invention only nine pins, it will of course be understood that the construction herein presented is equally adaptable for ten pins. I also do not wish to be understood as confining the mechanical arrangement to any particular game, inasmuch as it may be arranged in the form of a table and the balls impelled by means of cues, as in the game of billiards, or, furthermore, it may be constructed in very small form and placed on the market as a toy, to be played with very small balls or marbles.

The ropes 41' and 47' are preferably not made continuous, and it will be noticed that they are shown as connected separately to the pulley 47 by means of bolts 60 60'. Whenever the rope 41' becomes too slack to properly perform its function—that is, to raise the platform 35 the proper height, so as to raise the enlargement 38 sufficiently high to permit the ball to be discharged out of the ball-pit into the trough—the bolt 60 is removed and the rope 41' shortened and again secured to the pulley by said bolt 60.

What I claim as my invention is—

1. In a bowling-alley, the combination, of a flooring or platform, a bed arranged longitudinally thereof, said bed connected at its rear end with a portion upon which the pins are

placed, said portion having a series of openings therethrough, pins arranged on the pin portion, and having cords extending therefrom and passing through the openings, weights carried at the lower ends of the cords, a platform provided with a series of upwardly-extending fingers, and means for moving said platform upwardly and downwardly, the downward movement thereof drawing the fingers away from the weights, whereby the pull of the weights on the cords causes the pins to assume an upright position, and the upward movement of the plate causing the fingers to contact with the weights, and thereby move the weights upwardly, whereby the cords are slackened.

2. In a bowling-alley, the combination, of a flooring, or platform, a ball pit or casing at one end thereof, and having an opening there-through to permit the balls to pass therein, a bed arranged longitudinally of the flooring or platform, said bed communicating at its rear end with a portion upon which the pins are placed, said portion having a series of openings therethrough, pins arranged on the pin portion of the bed, and having cords extending therefrom and passing through the holes, weights carried at the lower ends of the cords, a platform provided with a series of upwardly-extending fingers, and also with an upwardly-extending arm having an enlargement or head at its upper end fitting the lower open end of the ball-pit, means for moving said platform upwardly and downwardly, the downward movement drawing the fingers away from the weights, whereby the pull of said weights on the cords causes the pins to assume an upright position, and at the same time the enlargement or head is caused to be drawn downwardly in the ball-pit, and the upward movement of said plate causing the fingers to contact with the weights, and thereby move the same upwardly, whereby the cords are slackened, and at the same time causing the enlargement or head of the arm to move upwardly in the ball-pit, and to discharge the ball carried thereby out of the upper end of the pit, and a return-trough adapted to receive said discharged ball.

3. In a bowling-alley, the combination, of a platform or flooring, a bed arranged longitudinally thereof, said bed connected at its rear end with a portion upon which the pins are placed, said portions having openings therethrough, cords extending from the pins and passing through the openings, weights carried at the lower ends of the cords, guides arranged beneath the pin portion of the bed and depending therefrom, and in line with the cord-openings, said guides adapted for the movement of the weights therein, a platform provided with a series of upwardly-extending fingers in line with the weights and guides, and means for moving said platform upwardly and downwardly, the downward

movement drawing the fingers away from the weights whereby the pull of the weights on the cords causes the pins to assume an upright position, and the upward movement of said plate causing the fingers to contact with the weights, and thereby move said weights upwardly in their guides, whereby the cords are slackened.

4. In a bowling-alley, the combination, of a platform or flooring, a bed arranged longitudinally thereof, said bed connected at its rear end with a portion upon which the pins are placed, said portion having openings therethrough, cords extending from the pins and passing through the openings, weights carried at the lower ends of the cords, a platform provided with a series of upwardly-extending fingers, cords connected to said platform and extending upwardly and joined to the single cord or extension, a pulley to which said cord is attached, a counterbalancing-weight suspended from the pulley, and a handle connected to the pulley and adapted for operating the same.

5. In a bowling-alley, the combination, of a sectional bed, each section provided on its under surface with ribs, the opposed side edges of the ribs being angle-notched to form tongues which match and fit each other side to side, a bolt passing transversely through the engaging tongues, and a locking-nut engaging a threaded end of the bolt.

6. In a bowling-alley, the combination, of a sectional bed, each section provided at opposite ends upon its under side, and at or near opposite side edges with lugs which abut against the similar lugs of the adjacent section, and each section also provided on its under surface with ribs, the opposed side edges of the ribs being angle-notched to form tongues, which match and fit each other side to side, bolts extending longitudinally of the bed and passing through the abutting lugs, nuts engaging threaded ends of said bolts, a transverse bolt passing through the engaging tongues, and a nut engaging a threaded end of said bolt.

7. The combination, of a bowling-alley, a return ball-trough therefor, supports for the trough, said supports arranged a desired distance apart throughout the length of the trough, and means for adjusting said supports vertically, independent of any adjustment of the platform and bed of the alley, whereby the inclination of the entire trough may be regulated.

8. In a bowling-alley, the combination, of upwardly-extending sleeves, yokes having depending stems fitting in said sleeves, adjusting-screws passing through the sleeves and engaging the stems, and connections extending from the arms of one yoke to the arms of another yoke, said connections forming rails along which the balls travel.

9. In a bowling-alley, the combination, of

upwardly-extending threaded stems, sleeves
having their lower ends interiorly threaded,
said interiorly-threaded lower ends adapted
to be screwed down onto the threaded stems,
5 yokes having depending stems fitting in the
sleeves, adjusting-screws passing through the
sleeves and engaging the stems, and con-
nections extending from the arms of one yoke

to the arms of another yoke, said connections
forming rails along which the balls travel. 10

In testimony whereof I affix my signature
in presence of two witnesses.

PAUL C. BIRSACH.

Witnesses:

A. L. MORSELL,
ANNA V. FAUST.