No. 700,614. Patented May 20, 1902.

Z. D. BUTTS.

PIN SETTING OR RESETTING DEVICE FOR BOWLING ALLEYS.

(Application filed Nov. 1, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. I.

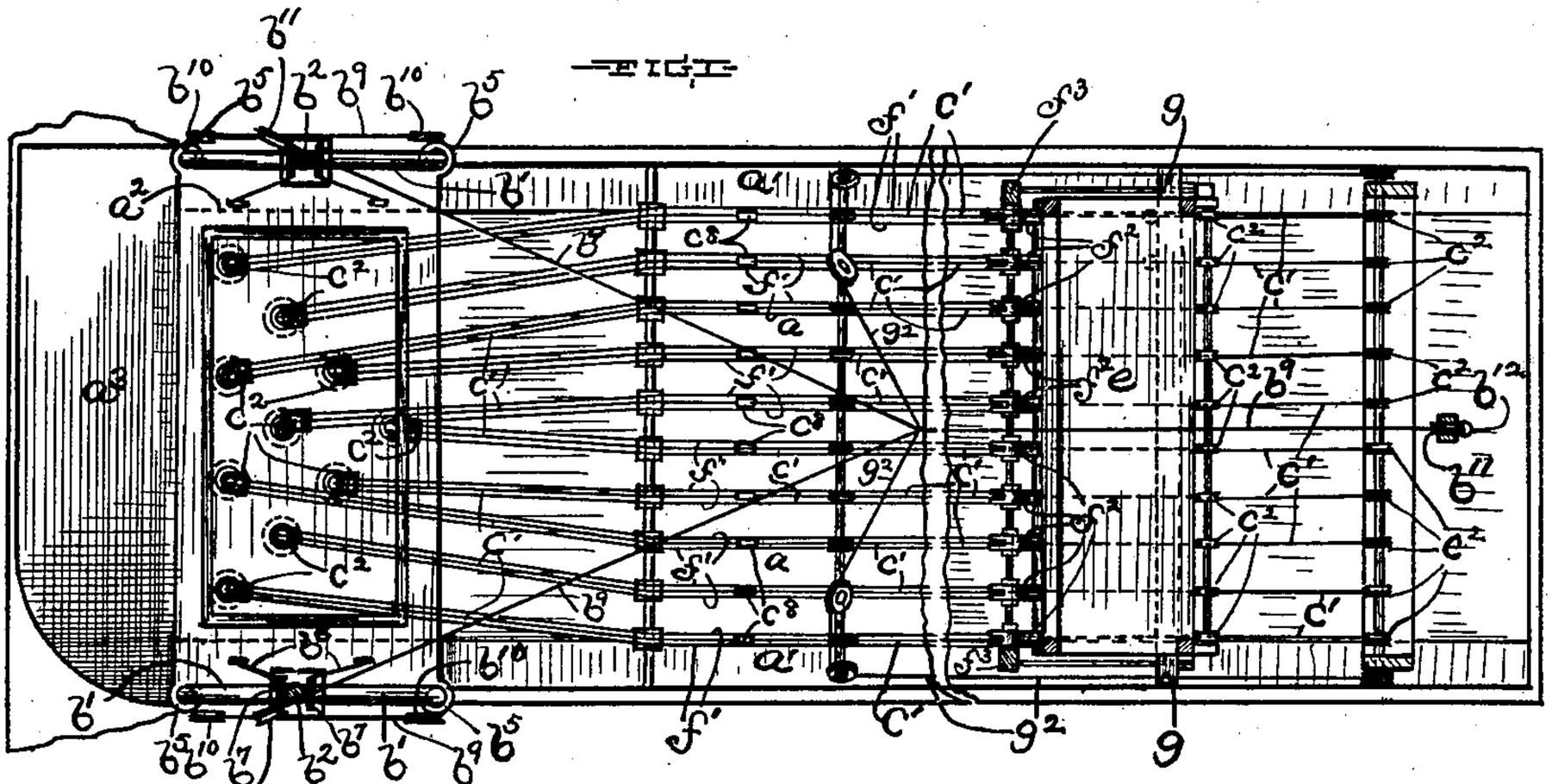
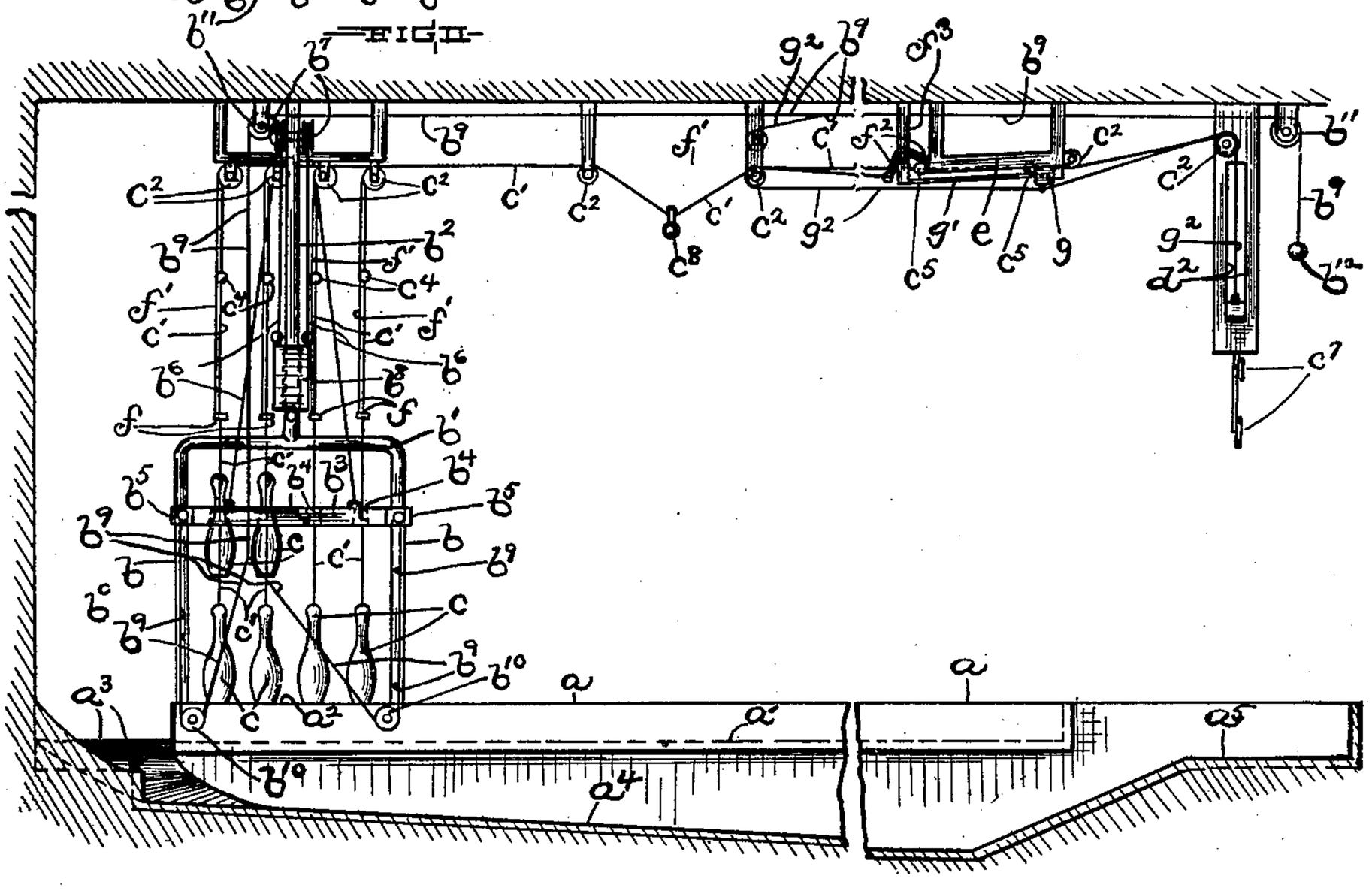


FIG. II.



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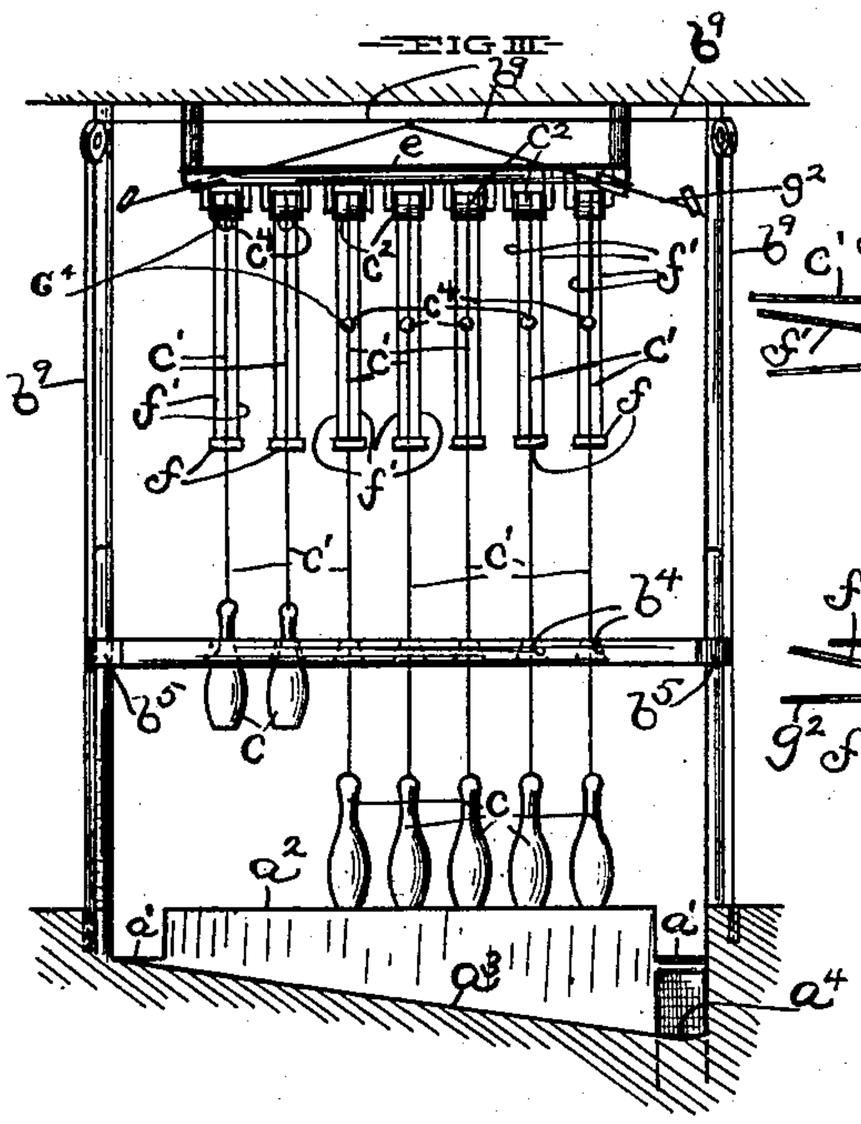
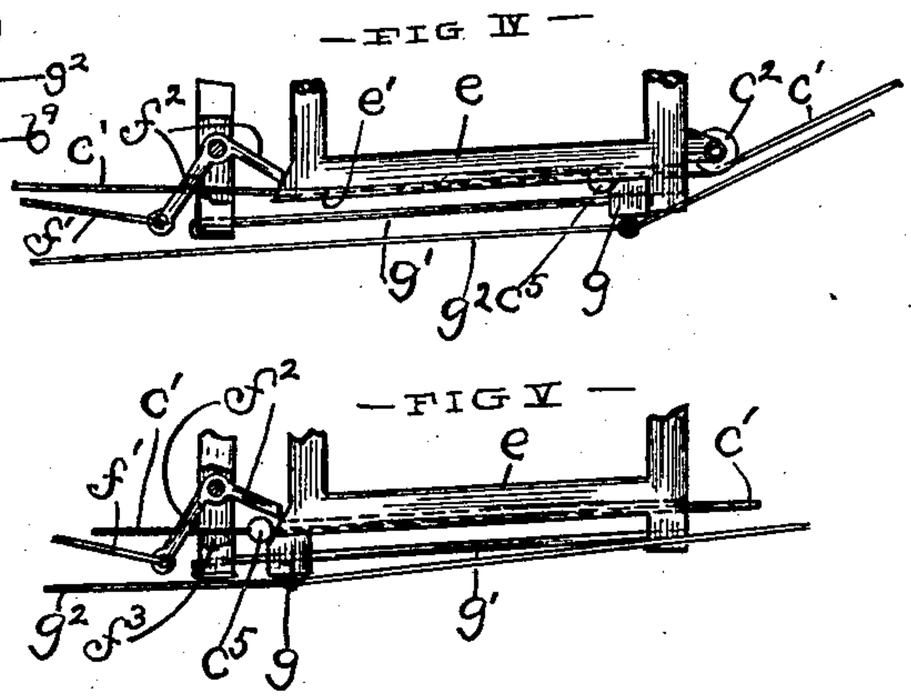
—FIG III—

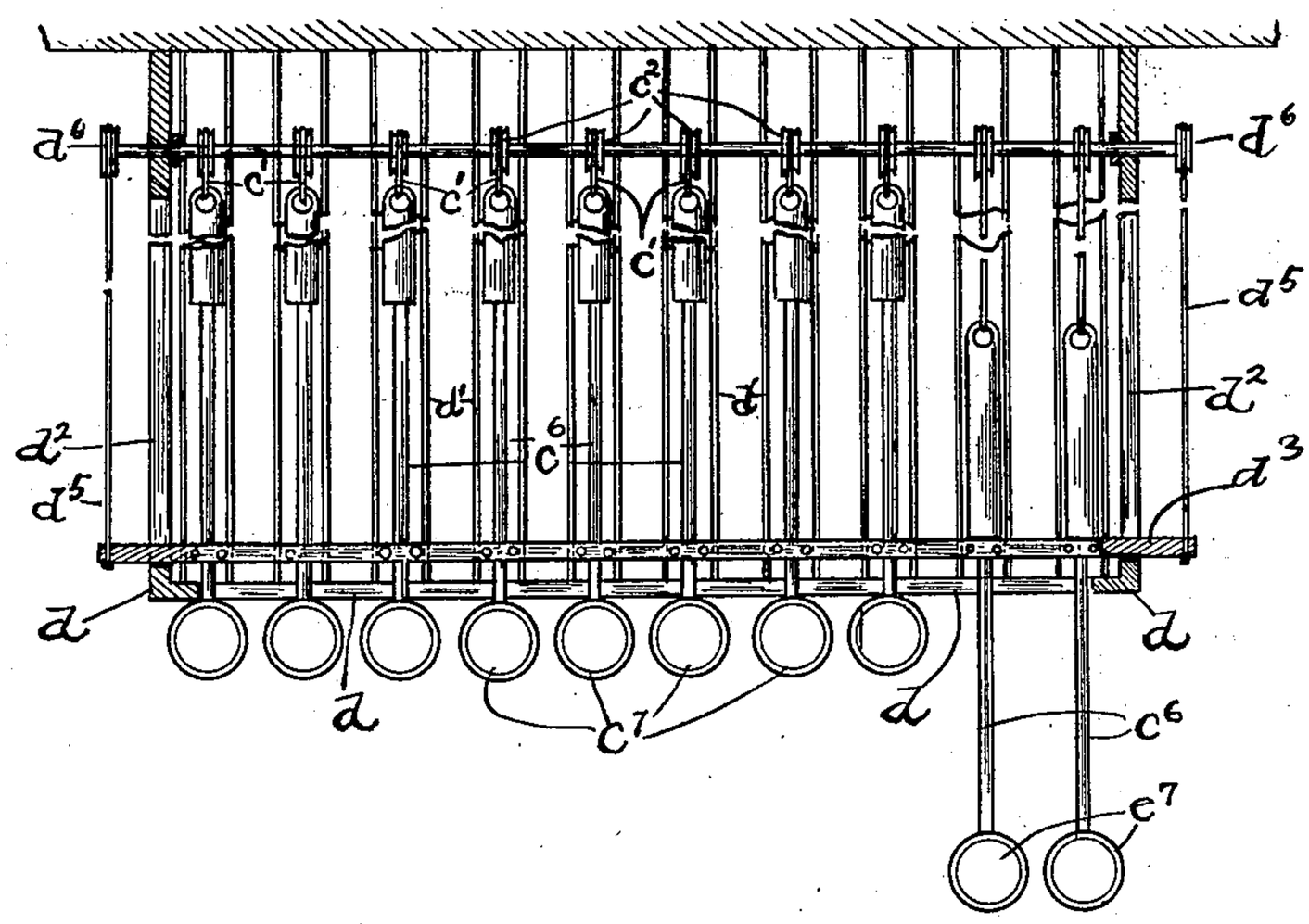


—FIG IV—



—FIG V—

—FIG VI—



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PIN SETTING OR RESETTING DEVICE FOR BOWLING-ALLEYS.

SPECIFICATION forming part of Letters Patent No. 700,614, dated May 20, 1902.

Application filed November 1, 1901. Serial No. 80,755. (No model.)

To all whom it may concern:

Be it known that I, ZEHNER D. BUTTS, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Pin Setting or Resetting Devices for Bowling-Alleys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in bowling-alleys.

The object of this invention is to provide a new and improved equipment for bowling-alleys by means of which the labor of maintaining the alley in working order is greatly lightened, thereby not only facilitating the playing of the game, but also reducing the cost of operating the alley.

With this object in view my invention consists in providing an improved mechanically-operated device for setting and resetting the pins of the bowling-alley after they have been knocked down, which said device can be controlled by an operator stationed at the front of the alley, thereby making it possible for the players to reset the pins for themselves, doing away with the necessity of an attendant at the rear of the alley.

My invention further consists in providing a novel arrangement whereby the balls will be automatically returned to the bowler.

My invention also consists in the peculiar arrangement and combinations of parts, as illustrated in the drawings and hereinafter described in the specification and pointed out in the claims.

In the accompanying drawings, Figure I represents a top plan of an alley provided with my equipment. Fig. II represents a sectional side elevation of the same. Fig. III represents a rear elevation. Figs. IV and V are detail views showing the construction of the tripping mechanism. Fig. VI is a view showing a portion of the front end of the bowling-alley.

Again referring to the drawings, a represents the floor of the alley; a' and a', the usual gutters on each side of the floor.

a^2 represents the platform at the rear end of the alley, upon which wooden pins c, which are preferably ten in number, are arranged in the usual manner. Immediately behind the platform a^2 is arranged the pit a^3 for receiving the balls which have been bowled. The floor of this pit is inclined and at its lower side opens into a guideway or conduit a^4, arranged below the floor of the alley and extending to the front end thereof. This conduit slants down from the rear end of the alley to within a short distance of the front of the alley and then inclines, so as to bring its outlet or mouth approximately level with the ball-rack a^5 at the front end of the alley. It will be seen that when the balls which have been bowled fall into the pit a^3 they will return by way of the conduit a^4 to the ball-rack a^5 at the front end of the alley.

At the sides of the platform a^2 are arranged four vertical posts or guides b. The posts on the same side of the platform are preferably joined at their upper ends by a cross-bar b', from the center of which a brace-rod b^2 extends to the ceiling. b^3 represents a plate preferably equal in size to the platform a^2. Vertical holes or openings b^4 are formed in this plate and are arranged so that a hole b^4 will be directly over each pin c. The holes b^4 are sufficiently large to allow the heads of the respective pins c to pass therein. The plate b^3 is mounted between the posts b by means of rings or straps b^5, which surround the respective posts, securing the plate b^3 against sidewise displacement, while allowing it to have free vertical movement up and down between the posts b. Two ropes b^6 and b^6 are secured at each side of the plate b^3 and are carried over pulleys b^7 and b^7, secured to the ceiling of the alley. The free end of the ropes on each side are secured to weights b^8 and b^8 and are arranged to slide verticaly on the respective brace-rods b^2 and b^2. The combined weight of the weights b^8 is greater than the weight of the plate b^3, so that the weights b^8 and b^8 hold the plate b^3 suspended over the platform a^2. Ropes b^9 are also secured to each side of the platform b^3 and are then carried down over pulleys b^{10}, secured near the surface of the platform a^2, and then up to and along the ceiling over the pulleys b^{11} to the front end of the alley. At a convenient point the ropes b^9 from each side of the plate b^3 are secured together to form a single rope, to the end of which is secured a handle or

knob b^{12}. It will readily be seen that the rope b^9 and the weights b^8 control the vertical movement of the plate b^3. A pull down on the rope b^9 will cause plate b^3 to approach the platform a^2, which in turn causes the weights b^8 to move up on the guide-rods b^2. When the rope b^9 is released, the weights b^8 will fall, lifting the plate b^3 up to its normal position above the platform a.

To the top of each pin c is secured one end of the cable or rope c'. These ropes are carried up through the respective holes b^4 in the plate b^3 to pulleys or rollers c^2, secured along the ceiling lengthwise of the alley. To the free end of each rope c' a short distance below the ceiling is attached a weight c^3, which is heavier than pin c, which is secured at the opposite end of the rope. At predetermined points on the cables c' are secured buttons c^4 and c^5, the purpose of which will hereinafter appear. To each weight c^3 at the end of the ropes c' is attached a rod c^6, to the end of which is secured an index-plate c^7.

At the front end of the alley near the ceiling is arranged a frame d, in which are formed partitions d', which serve as guideways for the weights c^3. At each side of the frame d are formed vertical guideways d^2, and in these guideways is mounted a horizontal bar d^3, so as to slide freely up and down therein. Lugs or pins d^4 extend from the bar d^3 into the respective partitions d' below the weights c^3.

e represents a plate which is secured to the ceiling and extends across the width of the alley above the cables c'. This plate is arranged so that it will engage the aforementioned buttons c^5 on the ropes c', so as to hold the ropes c' against the pull of the weights c^3, leaving some slack in the ropes between the buttons c^4 and the pins c. A sliding weight c^8 is secured to each cable c', so as to take up the said slack and prevent the cables c' from hanging loosely over the heads of the pins c.

f represents blocks which are strung on the respective ropes c. From each of these blocks two ropes f' are carried up to the ceiling and over the pulleys c^2 to one end of the tripping device or trigger f^2, which is pivotally suspended from the ceiling by means of a support f^3. This trigger f^2 is arranged so that a jerk on the end to which the ropes f' are secured will cause the other end to swing down and disengage the button c^5 from the edge of the plate e. When the balls are disengaged from the edge of the plate e, they will pass under the said plate, sliding in grooves e', formed in said plate, which prevent the ropes becoming entangled with each other.

In front of the plate e is mounted a bar g, which extends transversely of the ceiling of the alley. This bar is supported on rods g', so as to be free to move in a horizontal line. The object of this bar is to form a stop for the buttons c^5 after they have passed under the plate e, and thus limit the distance which the weights c^3 will fall. To each end of the bar g is secured a rope g^2, which is then carried back along the ceiling over pulleys g^3 and then brought forward again and secured to the rope b^9. When the buttons c^5 are all lined up against the bar g, the bar is then moved forward by pulling on the respective ropes g^2, thus carrying the buttons c^5 along and forcing them back into engagement with the plate e. From each side of the bar g ropes d^5 are carried over pulleys d^6 on the ceiling and then down to the bar d^3.

The operation of an alley when furnished with my equipment is as follows: When a pin c is knocked over, it will pull down one of the ropes c' secured thereto until the button c^4 on the said rope engages the block f, causing a jerk on the ropes f', tripping the trigger f^2, which in turn frees the button c^5 from its engagement with the plate e, which allows the weight c^3 to fall until the button c^5 comes into contact with the bar g and the weight c^3 rests on the pins d^4 of the bar d^3. When the weight c^3 falls, it will lift the pin c from the platform a^2, causing the neck thereof to enter one of the openings b in the plate b^3. Then by pulling down on the rope b^9 the plate b^3 is caused to approach the platform a^2, replacing the pins c in their proper positions thereon, and at the same time the bar d^3 will be pulled up, lifting the weights c^3, and the bar f will move back horizontally along the ceiling, carrying the buttons c^5 into engagement with the plate e. When the rope b^9 is released, the weights d^8 will lift the plate b^3 into its normal position above the platform a^2. The bar d^3 will fall of its own weight to the bottom on the frame d, drawing the bar f into its normal position at the front end of the alley.

What I claim is—

1. In a pin setting and resetting device the combination of an alley, a platform arranged at the rear end of said alley, vertical guides arranged at the sides of said platform, a plate mounted so as to slide freely between said guides, openings formed in said plate and corresponding to the position of the pins on said platform, means for normally holding said plate suspended above said platform and means for causing said plate to approach said platform, substantially as described and for the purpose set forth.

2. In a pin setting and resetting device the combination of a platform, pins arranged upon and normally supported by the said platform, pulleys mounted above said platform, ropes secured to said pins and supported by said pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of the said platform, locking devices for holding the ropes against the pull of the weights, means for releasing said locking devices when the pins become displaced from their normal positions, vertical guides arranged at the sides of said platform, a plate arranged to slide vertically in said guides, means for normally holding said plate at an elevation above said platform and means for

causing said plates to approach said platform, substantially as described and for the purpose set forth.

3. In a pin setting and resetting device, the combination of a platform, pins arranged upon and normally supported by said platform, pulleys mounted above said platform, ropes secured to said pins and supported by said pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of the platform, buttons secured on said ropes, a plate arranged above said ropes, and provided with projections adapted to engage said buttons, a trigger arranged below said plate, and means for causing the said trigger to release the buttons from said plate substantially as described and for the purpose set forth.

4. In a pin setting and resetting device the combination of a platform, pins arranged upon and normally supported by said platform, pulleys mounted above said platform, ropes secured to said pins and supported by said pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of the platform, buttons secured on said ropes, a plate arranged above said ropes and provided with projections adapted to engage said buttons, a trigger arranged below said plate, and means for causing the said trigger to release the buttons from said plate, a stop for limiting the travel of said buttons when released from said projections and means for replacing said buttons in engagement with said plate, substantially as described and for the purpose set forth.

5. In a pin setting and resetting device the combination of a platform, pins arranged upon and normally supported by said platform, pulleys mounted above said platform, ropes secured to said pins and supported by pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of the platform, buttons secured on said ropes, a plate arranged above the said ropes and provided with projections adapted to engage said buttons, a trigger arranged below said plate, blocks strung upon said ropes and operatively connected with said trigger, and buttons secured on said ropes above said blocks and arranged to engage said blocks when the said pins are moved from their normal positions, substantially as described and for the purpose set forth.

6. In a pin setting and resetting device, the combination of a platform, pins arranged upon and normally supported by said platform, pulleys mounted above said platform, ropes secured to said pins and supported by said pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of the said platform, locking devices for holding the ropes against the pull of the weights, means for releasing said locking devices when the pins become displaced from their normal positions, indices secured to said weights and arranged to indicate the positions of the respective pins, a frame located at the front end of said alley constituting a guideway for the said weights, a movable bottom arranged in said frame to support the said weights when in their lowest positions and means for lifting said bottom so as to restore the said weights to their normal positions, substantially as described and for the purpose set forth.

7. In a pin setting and resetting device the combination of a platform, pins arranged upon and normally supported by said platform, pulleys mounted above said platform, ropes secured to said pins and said pulleys, counterbalancing-weights secured to the free ends of said ropes above the level of said platform, a frame located at the front end of said alley constituting guideways for said weights, a movable bottom arranged in said frame to support said weights when in their lowest positions, buttons secured on said ropes, a plate arranged above said ropes, and provided with projections adapted to engage said buttons, a trigger arranged below said plate, blocks strung upon said ropes and operatively connected with said trigger, buttons secured on said ropes, above said block and arranged to engage said block when the pins are in their normal positions, vertical guides arranged at the sides of the platform, a plate arranged to slide vertically in said guides and form a stop to limit the upward movement of the said pins, means for holding said plates at an elevation above said platform, means for causing said plate to approach said platform, means for causing the first-mentioned button to come into engagement with the said first-mentioned plate and means for lifting the said weights to their normal positions, all arranged substantially as described and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of witnesses, this 24th day of October, 1901.

ZEHNER D. BUTTS.

In presence of—
THOMAS W. HEATLEY,
JOHN H. BUTTS,
N. P. WHELAN.