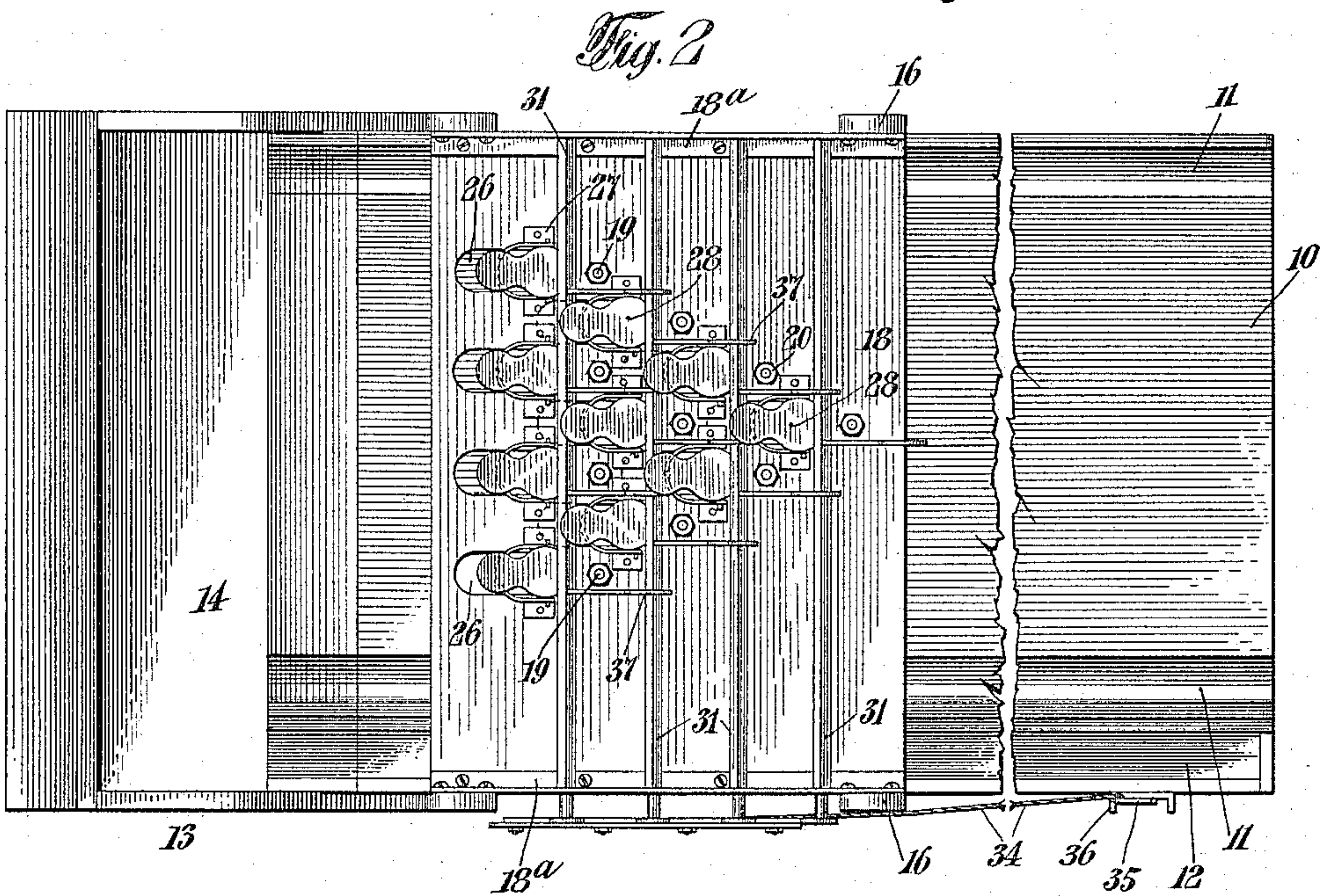
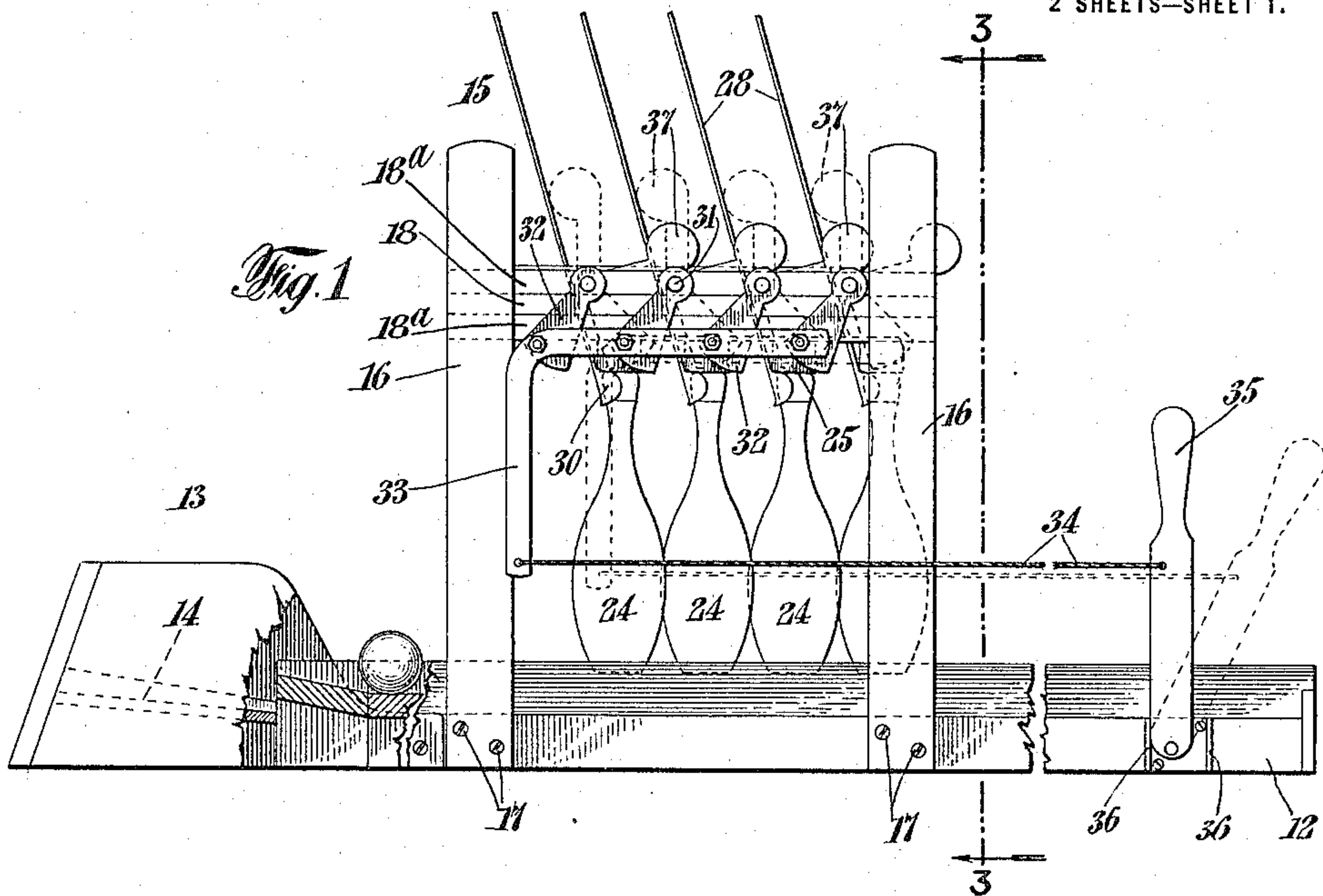


K. G. DIETERICH.
BOWLING ALLEY.
APPLICATION FILED NOV. 2, 1914.

1,155,329.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.



Witnesses:
Anna Ross
Edwin H. Dieterich.

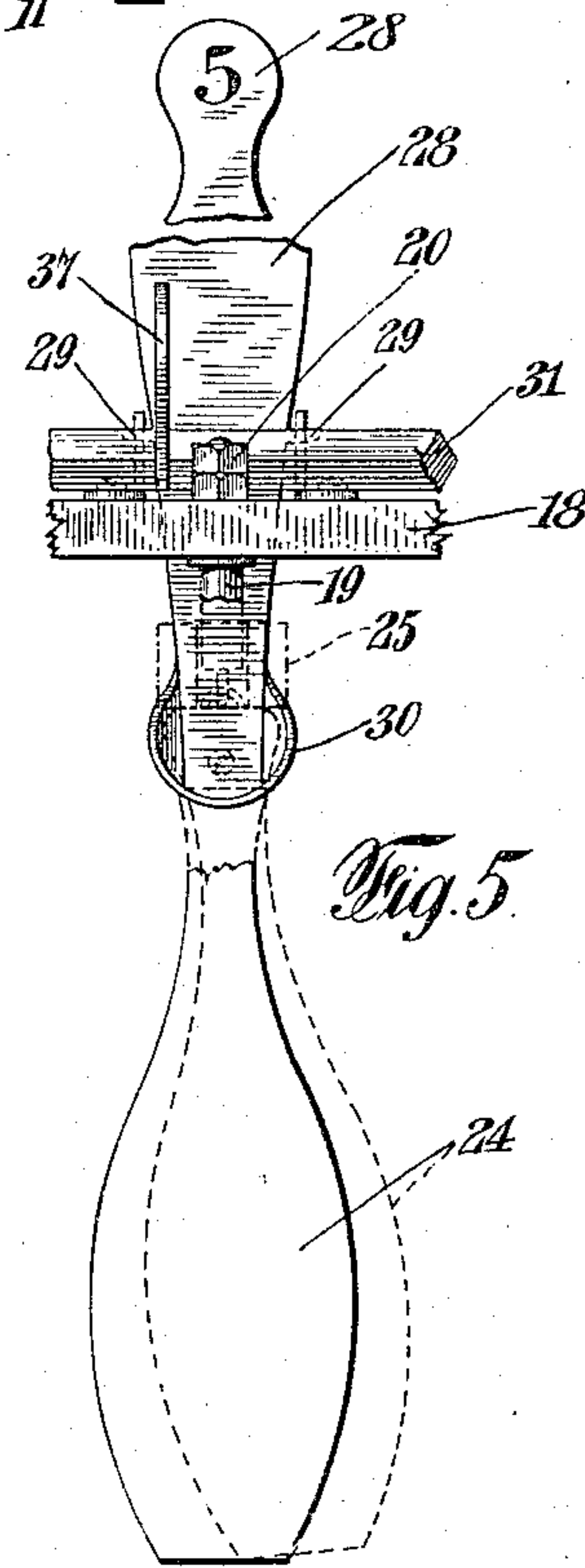
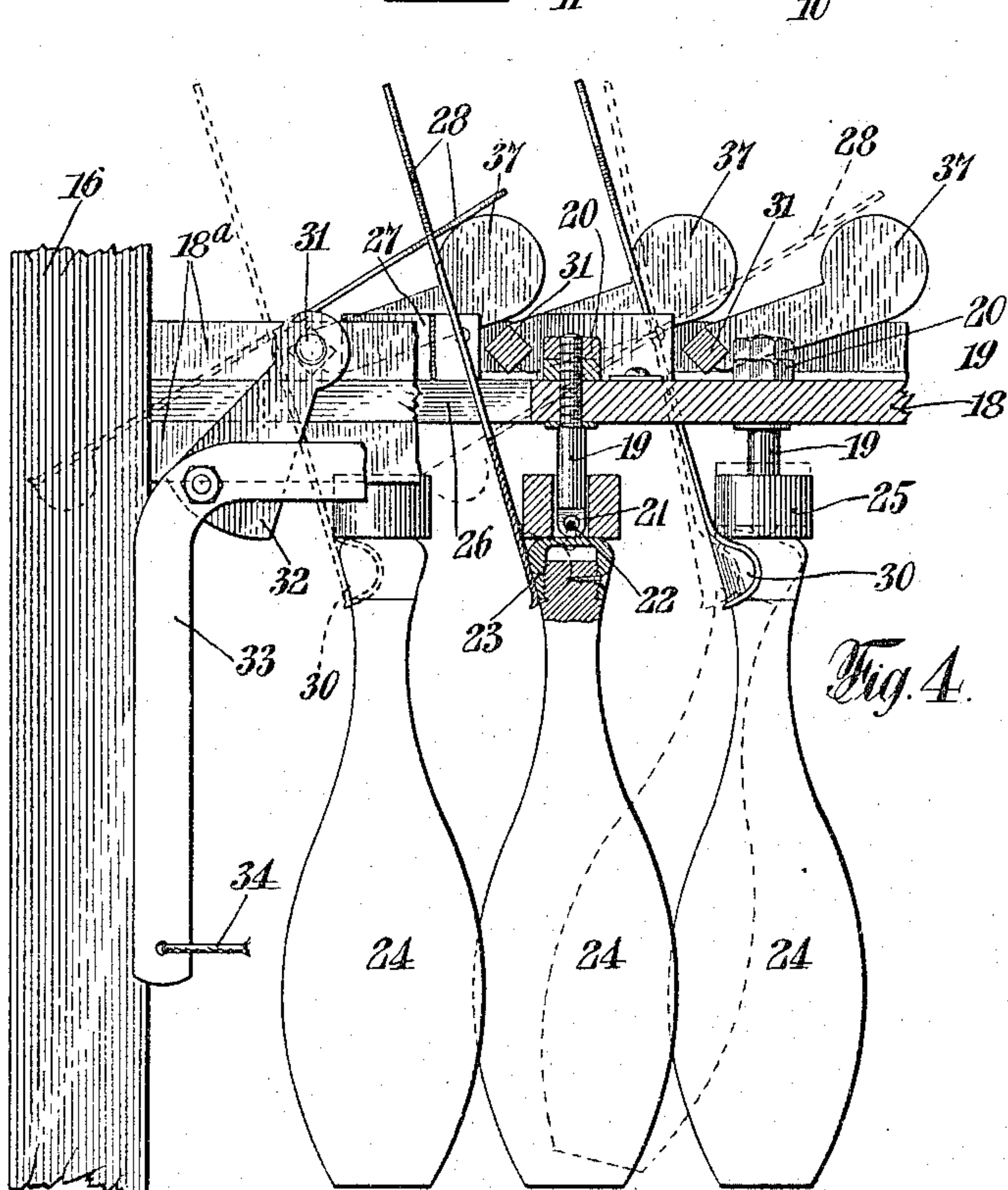
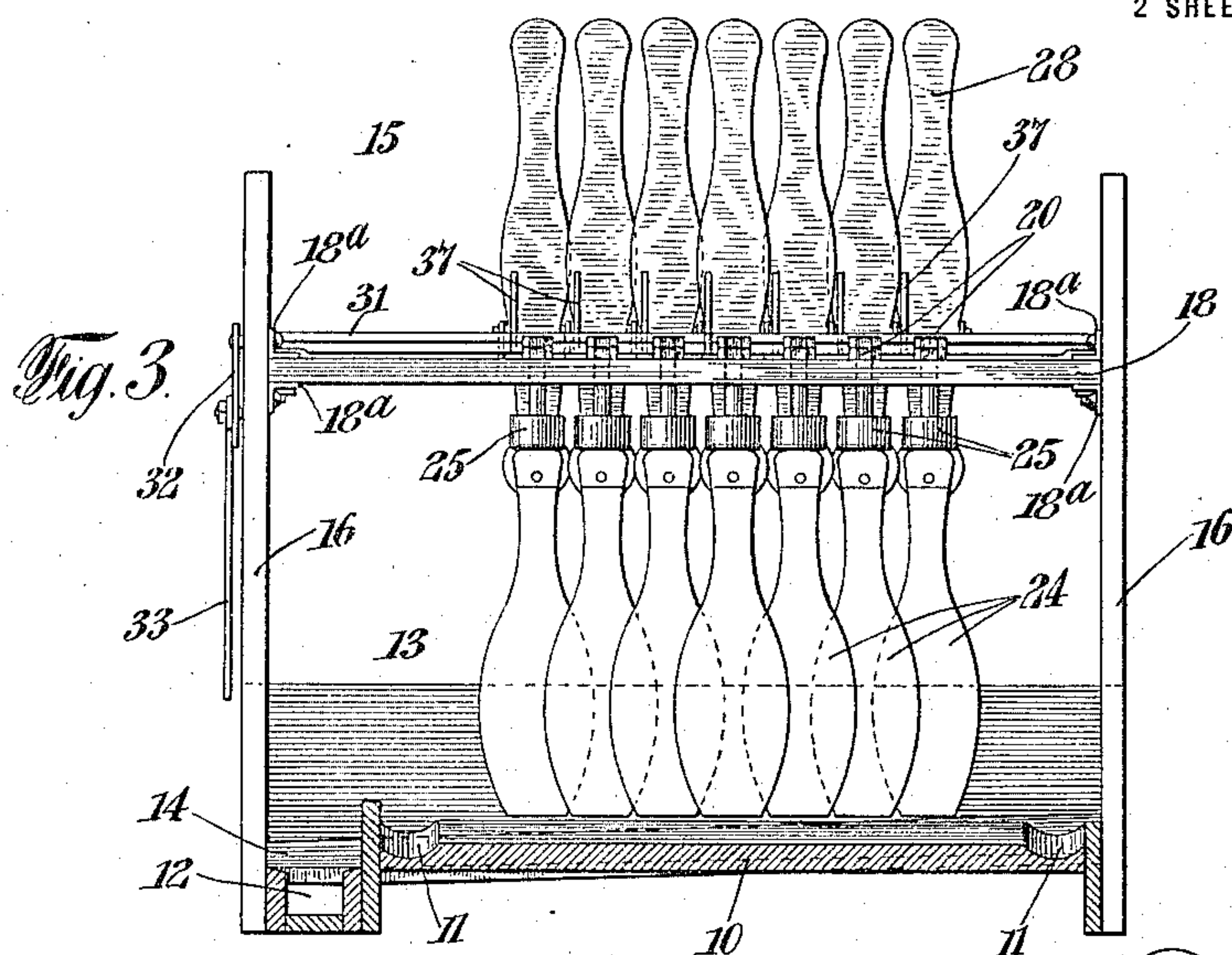
Inventor
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By his Attorney
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UNITED STATES PATENT OFFICE.

KARL G. DIETERICH, OF NEW YORK, N. Y.

BOWLING-ALLEY.

1,155,329.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed November 2, 1914. Serial No. 869,785.

To all whom it may concern:

Be it known that I, KARL G. DIETERICH, a citizen of the United States, residing at the city of New York, borough of Brooklyn, Kings county, in the State of New York, have invented certain new and useful Improvements in Bowling-Alleys, of which the following is a full, clear, and exact specification.

My invention relates to improvements in game apparatus, and the same has for its object to provide a simple, efficient and reliable bowling alley in which the pins are so arranged and supported that when the same are struck, they will operate markers to indicate the particular pins which have been struck by the ball.

Further, said invention has for its object to provide a bowling alley in which the pins are individually supported or suspended from their upper ends, and provided with indicating means which is adapted to be actuated when the pins are oscillated or moved in any direction longitudinally or transversely of the alley.

Further, said invention has for its object to provide a bowling alley with means for pivotally suspending the pins and with means for quickly and positively restoring the same to a state of rest after the same have been struck by a ball.

Further, said invention has for its object to provide means for resetting the indicating devices for the pins whereby said indicating devices, or such thereof as have been tripped, may be readily and conveniently restored from a point adjacent to the forward end of the alley whence the balls are thrown.

To the attainment of the aforesaid objects and ends, my invention consists in the novel details of construction, and in the combination, connection and arrangement of parts hereinafter more fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification wherein like numerals of reference indicate like parts,—Figure 1 is a side view partly broken out showing one form of apparatus constructed according to and embodying my said invention; Fig. 2 is a plan or top view thereof; Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1; Fig. 4 is an enlarged detail side view, partly in section, showing a portion of the pin supporting means, the

indicating devices therefor, the means for resetting said indicating devices, and means for quickly restoring the pins to their positions of rest after the same have been struck, and Fig. 5 is a front view of a single pin, together with its supporting mechanism and the indicating mechanism therefor.

In the accompanying drawings the apparatus is shown as comprising a base 10 provided along its longitudinal edges with gutters 11, 11, and adjacent to one of said gutters with a longitudinal runway 12 for the return of the balls.

To the rear of the alley is arranged a stop comprising a detachable receptacle section 13 comprising an inclined back, the top of which rises above the level of the base 10, and having a rearwardly and laterally inclined floor 14 whose lower end terminates adjacent to the rear end of the runway 12, so that the balls, after having struck the pins, may pass from the base 10 to the inclined floor 14, and thence travel down said inclined floor 14 to the runway 12.

15 denotes a support comprising a plurality of vertical standards 16, 16, two of which are arranged at each side of the alley close to the forward edge of the stop 13. The ends of said standards 16, 16 may be secured by screws 17, 17, or other suitable means to the side of the alley base 10. 18 denotes a platform which is supported intermediate the standards 16, 16, and is secured in position thereon by longitudinal angle bars 18^a, 18^a having their horizontal faces engaging said platform and their vertical faces secured to the inner sides of said standards. From the underside of the said platform 18 extend ten bolts 19, 19 which have their upper ends secured to said platform by nuts 20, 20, and their lower ends provided with eyes 21, 21 within which are disposed semi-circular eyes 22, 22, secured to caps 23, 23 provided upon the upper ends of the pins 24, 24. By this arrangement the pins 24 are free to oscillate readily in all directions. Upon each bolt 19 intermediate the underside of the platform 18 and the cap 23, is loosely disposed a vertically movable steady- ing member or weight 25 which bears upon the upper end of the pin, and serves to steady said pin and to cause the same to return quickly to its normal position of rest after the same has been struck by a ball.

The platform 18 is provided to the rear of each bolt 19 with a longitudinal slot 26

adjacent to the opposite longitudinal edges of which are secured the ends of U-shaped bearings 27; 27 in which are pivotally supported the indicating devices 28, 28. The
 5 indicating devices 28 are flat and shaped in outline to represent a bowling pin, and are arranged upon the platform 18 in the same relative positions as the pin which they represent and by which they are operated.
 10 The said indicating devices 27 are provided adjacent to their lower ends with laterally extending trunnions 29, 29 which are supported in the bearings 28 on the platform 18. The lower ends of said indicating devices
 15 28 are tapered, and provided upon their opposite sides at their lower ends with forwardly and outwardly projecting lips or flanges 30, 30. The edges of said lips or flanges 30, 30 are curved so as to act as cams
 20 whereby to throw the upper portions of said indicating devices 28 forwardly and overbalance the same as the pins 24 are caused to assume positions slightly off the normal vertical position of rest in consequence of
 25 being struck by a ball.

Above the upper surface of the platform 18 is arranged a series of transverse, parallel shafts 31 which have their ends supported in apertures provided in the vertical portions of the angle bars 18^a, 18^a. As viewed
 30 at Fig. 2, the forward ends of said shafts 31, which extend through the forward angle bar 18^a are provided with weighted arms 32, 32, to the ends of which is connected the
 35 horizontal portion of an L-shaped arm 33. To the depending, vertical portion of said arm 33 is secured one end of the flexible connecting member, such as a rope or chain
 40 34, which has its forward end connected to a setting lever 35 pivotally secured at its lower end to one side of the runway 12 intermediate stops 36, 36 arranged adjacent to the forward end of said runway.

Upon the shafts 31, 31 are secured forwardly extending resetting arms 37, 37 having their free ends rounded and adapted to engage with the forward surfaces of the
 45 indicating members 28, 28 when said indicating members are tripped and caused to fall forwardly and assume the position indicated in dotted lines at Fig. 4.
 50

The indicating members 28, 28 may be provided upon their forward surfaces with numerals or any other desired characters to
 55 indicate or designate the value of the pins with which they cooperate, as indicated at Fig. 5.

The operation of the apparatus is as follows:—When a ball is thrown down the
 60 alley and strikes anyone of the suspended pins 24 it will cause said pins to be moved either to the rear or sidewise, as indicated in dotted lines at Figs. 3 and 4. As soon as any one of said pins has been struck
 65 or deflected from its true vertical position

the upper end thereof will be caused to engage with the curved edges of the lips 30, 30 provided at the lower end of its indicating members 28, and move the lower end of said indicating member 28 rearwardly to
 70 such extent as will cause the upper end thereof to become overbalanced and drop forwardly, upon its respective resetting member 37, as indicated at Fig. 4. As soon as the lower end of each of said indicating
 75 members is released of its engagement with the upper end of its respective pin 24, the said pin will at once resume its true vertical position, and in assuming such position, it will be assisted in coming to a state of com-
 80 plete rest by the action of the steadying weight 25 which is slidably disposed upon the bolt 19, and rests directly upon the upper end of the cap 23 of said pin. After one or more balls have been thrown and the
 85 indicating members 28, 28 tripped by the action of the pins struck, the said indicating members 28, 28 may be reset by merely drawing forward the upper end of the lever 35, which in turn, through the medium or
 90 flexible connection 34, will cause the L-shaped arm 33 to be drawn forwardly, and in being so moved will partially rotate the arms 32 and the shafts 31, 31, and cause the forward ends of the resetting members 37,
 95 37 to rise, and restore the indicating members, 28, 28 to their inclined, normal positions, as shown.

It is to be noted particularly that my improved apparatus consists of but three component parts, viz: the base 10, the detachable stop at the rear thereof, and the support
 100 15, which parts may be easily assembled and secured together. Further it is to be noted that a single operation of the resetting
 105 mechanism serves to restore all the indicating members which have been tripped no matter what the number of such indicating members may be.

Having thus described my said invention,
 110 what I claim and desire to secure by Letters Patent is:—

1. In a bowling alley, the combination with a series of pins, means for yieldingly suspending said pins, of a series of indicating members loosely engaging said pins and partly surrounding the same adjacent to their
 115 suspended ends so as to be operated thereby, resetting means for said indicating members, and means for actuating said resetting
 120 means to restore said indicating members after the same have been tripped by the pins, substantially as specified.

2. In a bowling alley, the combination with a support and a series of pins, of means
 125 for yieldingly suspending said pins, pivotally supported indicating members for said pins, means on said indicating members adapted to engage with said pins in order to trip said indicating members when said pins
 130

are oscillated, and means for resetting said indicating members after the same have been tripped by said pins, substantially as specified.

5 3. In a bowling alley, the combination with a support and a series of pins, of means for yieldingly suspending said pins, a series of indicating members corresponding in number with said pins and pivotally supported above the same, means arranged upon
10 said indicating members below their points of support adapted to engage with said pins whereby to trip said indicating members when said pins are oscillated, and means for
15 quickly restoring said pins to their positions of rest after said pins have tripped said indicating members, substantially as specified.

20 4. In a bowling alley, the combination with a support and a series of pins, of means for yieldingly suspending said pins, a series of indicating members corresponding in number with said pins and pivotally supported above the same, means arranged upon
25 said indicating members below their points of support adapted to engage with said pins whereby to trip said indicating members when said pins are oscillated, and weights disposed upon the upper ends of said pins
30 for quickly restoring the same to their positions of rest after said pins have tripped said indicating members, substantially as specified.

35 5. In a bowling alley, the combination with a support and a series of pins, of means for yieldingly suspending said pins, a series of indicating members corresponding in number with said pins and pivotally supported above the same, means arranged upon
40 said indicating members below their points of support adapted to engage with said pins whereby to trip said indicating members when said pins are oscillated, and weights slidably disposed upon the suspending means
45 for said pins and resting upon the upper ends thereof for quickly restoring the same to their positions of rest after said pins have tripped said indicating members, substantially as specified.

50 6. In a bowling alley, the combination with a support and a series of pins, of means for yieldingly suspending said pins, a series of indicating members corresponding in number with said pins and pivotally supported above the same, outwardly and forwardly extending curved flanges arranged at the opposite edges of the ends of said indicating members below their points of support adapted to engage with said pins
60 whereby to trip said indicating members when said pins are oscillated, and weights slidably disposed upon the suspending means for said pins and resting upon the upper ends thereof for quickly restoring the same
65 to their positions of rest after said pins have

tripped said indicating members, substantially as specified.

7. In a bowling alley, the combination with a support and a series of pins, of bolts extending through said support for yield- 70 ingly suspending said pins, a series of indicating members corresponding in number with said pins and pivotally supported above the same, means arranged upon said indicating members below their points of support adapted to engage with said pins 75 whereby to trip said indicating members when said pins are oscillated, and annular weights disposed upon said bolts and resting upon the upper ends of said pins for quickly restoring the same to their positions of rest after said pins have tripped said indicating members, substantially as specified. 80

8. In a bowling alley, the combination with a support, a series of pins, and a series of rigid supports for said pins, of means for yieldingly suspending said pins from said supports, indicating members, corresponding in number with said rigid supports, pivotally mounted intermediate their ends above said pins, means at the lower ends of said indicating members normally engaging said pins whereby to trip said indicating members when said pins are oscillated, resetting means adapted to engage with the upper ends of said indicating members when the same have been tripped, and means for actuating said resetting members to restore said indicating members after the same have been tripped by said pins, substantially as specified. 85 90 95 100

9. In a bowling alley, the combination with a base, of a support arranged thereon, a series of depending supporting members rigidly secured to said support, pins pivotally secured to the lower ends of said depending supports, steadying members slidably mounted upon said depending supports and resting upon the upper ends of said pins, a series of pivotally supported indicating members arranged upon said support, cam means provided at the lower ends of said indicating members adapted to engage the upper ends of said pins, a series of shafts arranged upon said support, resetting members fixed upon said shafts adapted to engage with said indicating members when the same have been tripped, and means for simultaneously actuating said shafts whereby to cause the resetting members thereon to restore said indicating members to their normal positions in engagement with said pins, substantially as specified. 105 110 115 120

10. In a bowling alley, the combination with a base of an elevated support arranged thereon, a series of depending members rigidly secured to said support, pins pivotally secured to the lower ends of said depending supports, annular weights slidably disposed upon said depending supports and resting upon the upper ends of said pins, bearings 125 130

upon said support adjacent to the upper ends of said depending supports, indicating members pivotally mounted intermediate their ends within said supports, cam means
5 provided at the lower ends of said indicating members adapted to embrace the upper ends of said pins, bearings arranged upon said support, a series of transverse shafts mounted in said bearings, resetting arms secured to said shafts adapted to support the
10 upper ends of said indicating members when the same have been tripped, counterweighted arms secured to the ends of each of said transverse shafts, a link connecting said
15 counterweighted arms, and means for operating said link to actuate said transverse shafts whereby to cause the resetting arms thereon to restore said indicating members to their normal positions in engagement
20 with said pins, substantially as specified.

11. In a bowling alley, the combination with a base of an elevated support arranged thereon, a series of depending members rigidly secured to said support, pins pivotally
25 secured to the lower ends of said depending supports, annular weights slidably disposed upon said depending supports and resting upon the upper ends of said pins, bearings upon said support adjacent to the upper
30 ends of said depending supports, indicating

members pivotally mounted intermediate their ends within said supports, cam means provided at the lower ends of said indicating members adapted to embrace the upper ends
35 of said pins, bearings arranged upon said support, a series of transverse shafts mounted in said bearings, resetting arms secured to said shafts adapted to support the upper ends of said indicating members when the
40 same have been tripped, counterweighted arms secured to the ends of each of said transverse shafts, a link connecting said counterweighted arms, an operating lever pivotally secured at its lower end to said
45 base adjacent to the forward end thereof, and a flexible member connecting said operating lever with said link whereby to actuate said transverse shafts and cause the resetting arms thereon to restore said indicating
50 members to their normal positions in engagement with said pins, substantially as specified.

Signed at the city of New York, in the county and State of New York, this 8th day of October, one thousand nine hundred and
55 fourteen.

KARL G. DIETERICH.

Witnesses:

CONRAD A. DIETERICH,
JOSEPH G. QUINN, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."