

No. 644,628.

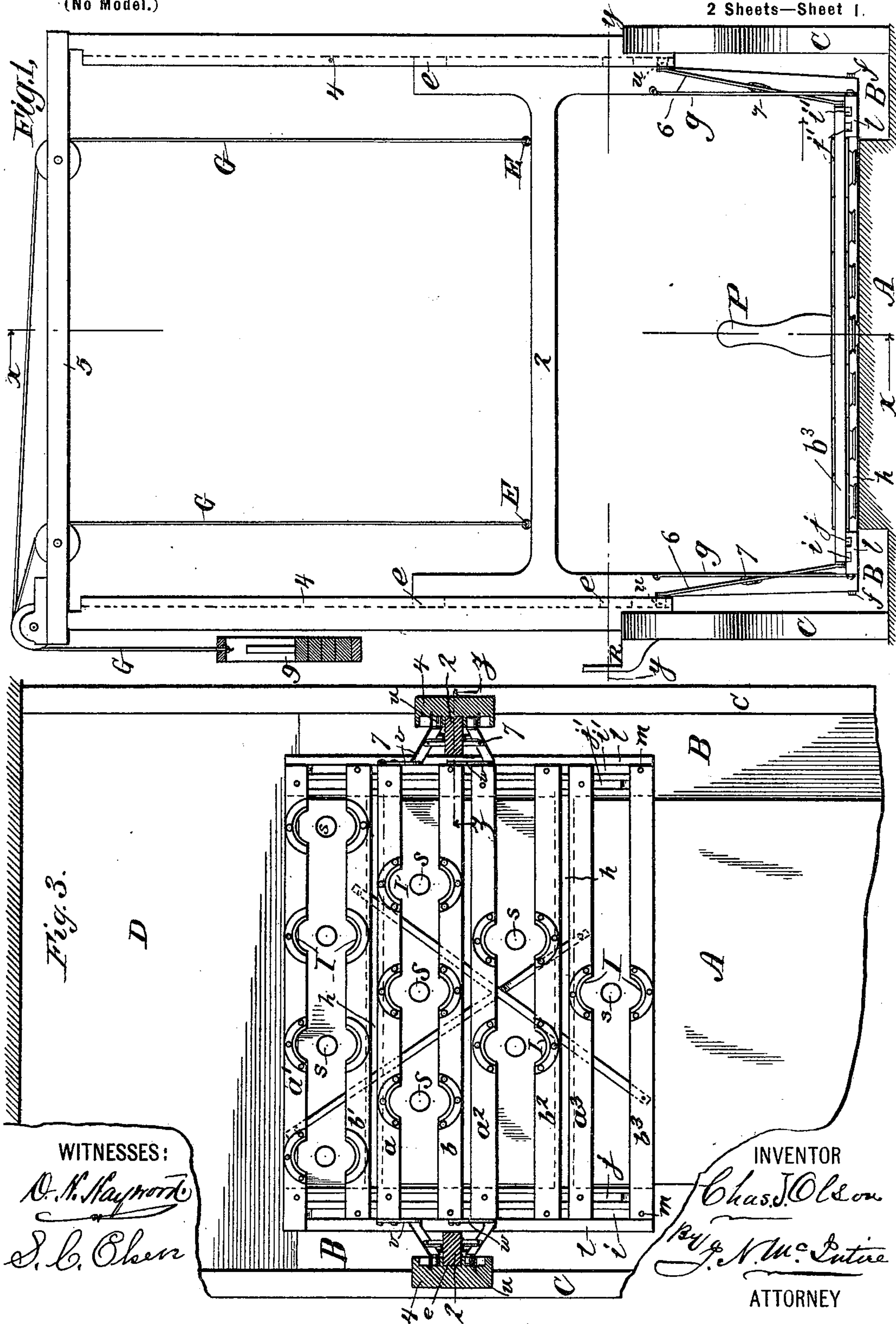
Patented Mar. 6, 1900.

C. J. OLSON.
BOWLING ALLEY.

(Application filed Jan. 2, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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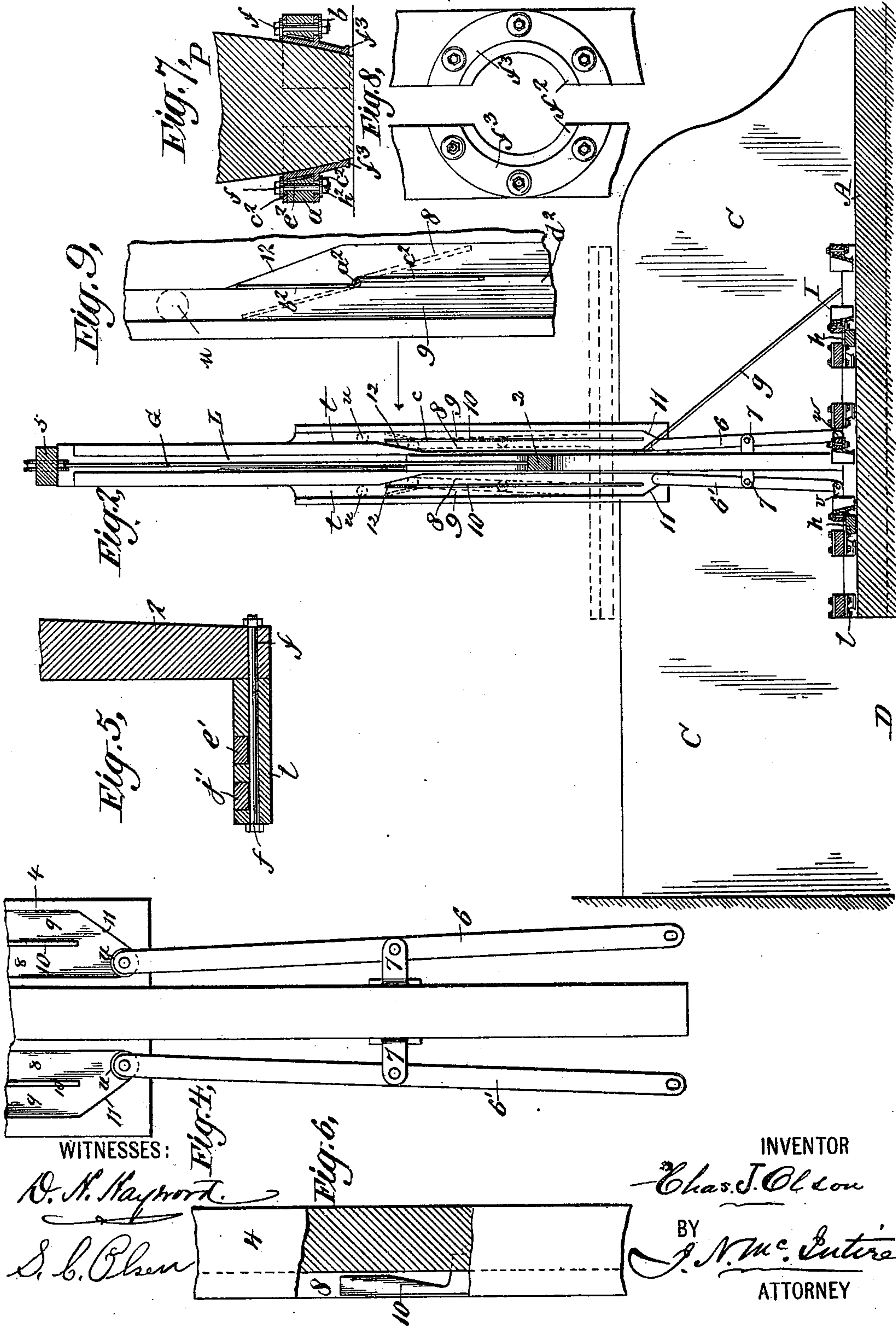
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2 Sheets—Sheet 2.



WITNESSES:

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CHARLES J. OLSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE BRUNSWICK-BALKE-COLLENDER COMPANY, OF SAME PLACE.

BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 644,628, dated March 6, 1900.

Application filed January 2, 1900. Serial No. 54. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. OLSON, of Chicago, Cook county, State of Illinois, have invented a new and useful Improvement in Bowling-Alleys; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that genus or type of pin-spotters (or pin-setters) in which a pin carrier and depositor is employed that moves toward and away from the usual stationary pin-supporting pit end portion of the alley-bed, into or onto which carrier the pins are put by the pit-boy when it is in its highest position and which when loaded with the whole set of pins lowers them down toward and depositing them exactly on their respective spots on the alley-bed then releases the pins and ascends to its highest or normal position out of the way; and my invention has for its objects to provide for use a pin-spotter of this type which while it shall be simple and economic of construction, strong, and durable may be easily manipulated or operated by the pit-boy and will always spot all the pins accurately.

To these ends and objects my invention consists in the novel structural features and combinations of devices going to make up the improved pin-spotter which I will now proceed to describe and which will be found most particularly pointed out in the claims of this specification.

In the accompanying drawings, which make part of this specification, I have shown my invention carried out in that precise form in which I have so far made and used pin-spotters embodying it, though the construction may be more or less modified without changing the character of the hereinafter-claimed features thereof, and hence without departing from my said invention.

In the several figures I have in each denoted the same part of the contrivance by the same reference-sign, and in some of the views I have adopted a different scale from that on which others are made in order to more clearly illustrate certain details.

In the drawings, Figure 1 is a front elevation of one of my improved pin-spotters combined with or properly arranged in connection

with the pit end portion of an ordinary bowling-alley. Fig. 2 is a vertical section of the same, taken in a plane indicated by the dotted line xx at Fig. 1 looking in the direction indicated by the arrow in said last-mentioned figure. Fig. 3 is a horizontal section taken in a plane indicated by the dotted line yy at Fig. 1 looking downwardly on the device. Fig. 4 is a detail or skeleton side view, on an enlarged scale, looking at the parts in the direction indicated by the half-arrow near the right-hand bottom corner of Fig. 1. Fig. 5 is a detail vertical section at the dotted line zz of Fig. 3, made on the same scale as Fig. 4. Fig. 6 is a detail skeleton side view of certain parts viewed from the direction indicated by the arrow at the right-hand side of Fig. 2. Fig. 7 is a detail sectional view of one of the pin-holders. Fig. 8 is a top view of the same. Fig. 9 shows a modification of the switch device for guiding the cam-rollers.

At P, Fig. 1, I have shown one of the pins (the head pin or "No. 1" pin) of a set such as usually used and which the pin-spotter is employed to "set up."

In the drawings, A is a portion of the bed or hallway, B B the ball-gutters, and C C the side buffers, of an ordinary bowling-alley of approved construction, with which is combined one of my improved pin-spotters in a manner and constructed and operating as I will now proceed to explain.

As usual, that portion immediately over which is arranged or located the pin-spotting device or mechanism has marked on its surface the spots s on which the ten pins are to be exactly placed for the game of "tenpins," and immediately in rear of the back end of said bed A is the depressed space d , designated the "pit" of the alley, into which the pins are knocked and the bowled balls received (all as well understood by those skilled in the art) and the rear vertical wall of which is, as usual, composed of the ordinary swinging pendent cushion. (Not shown in the drawings.)

Mounted on top of and having their lower end portions securely fastened to the side buffers C C are two vertically and oppositely arranged posts or uprights 4 4, which have their upper ends securely connected by a cross-piece or tie-beam 5, and the framework thus formed of the two vertical parts 4 4 and the

top cross-piece 5 thus mounted fast on the side buffers constitutes the support for and part of the whole working mechanism of the pin-spotter.

5 Intermediately of the uprights 4 4 is located an **H**-shaped carriage-frame 2, composed, as shown, of two vertical and one horizontal portion, (made in the case shown integral and of wood, of which material most
10 all the other parts of the pin-setter are composed,) the two vertical parts being fitted or adapted by means of laterally-projecting lugs *e* to engage with vertical grooves in the said uprights 4 4, as and for a purpose which will
15 be presently explained. To the lower ends of the vertical pieces or lugs of the **H**-shaped sliding frame 2 is securely fastened, by means of a bolt *f* at each side (see Fig. 5) and two metallic braces *g g*, (see Fig. 2,) the pin
20 carrying and depositing frame. This pin carrier and depositor is composed, as shown, of two side bars or beams 1 1 (running parallel with each other at opposite sides of the pin-setter device) and two cross-bars *h h*, all
25 rigidly framed together in the same horizontal plane, and immediately on top of the frame are located a series of sets or pairs of laterally-movable bars *a b*, *a' b'*, *a² b²*, and *a³ b³*, running parallel with the cross-bars *h h*
30 of said frame and forming the pin-carriers proper, operating as I will now explain. Each of the side beams 1 has formed in its upper side or surface two parallel recesses, each running the whole length of the beam, and in each
35 of said recesses or grooves is a sliding strip or bar, so that there are two of such slides in each groove-beam 1, as shown, respectively, (see Fig. 1,) at *i j* and *i' j'*. The sliding bars *a*, *a'*, *a²*, and *a³* are made fast at one set of their
40 ends (by wood-screws *m* or otherwise) to the slide *j* and at their opposite ends to the slide *j'*, while, as shown, the bars *b*, *b'*, *b²*, and *b³* are fastened in like manner, respectively, at their opposite ends to the slides *i* and *i'*. The
45 four sets of movable bars *a b*, &c., have arranged at their under sides and pivotally connected with them, as shown, (see Fig. 3,) two metallic brace rods or bars for the purpose merely of lending strength and stability to
50 the entire set of said bars at the vicinity of the middle part of the pin-setting device, and in the adjacent edges of each pair of bars *a b*, &c., are nearly semicircular cut-outs *I*, forming socket-like apertures or bottomless receptacles, each adapted to receive and properly
55 hold one pin for placement on the bed, as illustrated at *P*, Fig. 1. One set or pair of the movable bars—viz., those lettered *a b*—is connected, as I will presently explain, to
60 the mechanism by which the bars of all the sets are slightly spread farther apart when the pin-carrier frame is down, as seen at Fig. 1, and are moved closer together when said frame is in its highest position, and the entire
65 frame, with the **H**-shaped frame 2, to which it is fastened, is adapted to descend when filled with the pins and assisted some by the

pit-boy and to be elevated when empty by a weight 9, pendent to cords or other flexible connections *G*, (see Fig. 1,) which, as seen, 70 are fastened at *E* to the carriage-like frame 2.

To each one of the leg-like portions of frame 2 are securely fastened two (one on each side) laterally-projecting metallic stands 7 7, (see Figs. 1 and 2,) in which are pivotally mounted 75 (at or about their middle portions) a pair of lever-bars 6 6', which at their lower ends are coupled to one pair of the pin-carrier bars *a b*, while at their upper ends they are provided with antifriction-rollers that run in cam- 80 grooves formed in the inner faces of the uprights 4 of the machine. As this mechanism is duplicated at either side of the machine, I will describe it as shown at one side—viz., that side shown at Fig. 2 and at the right- 85 hand portion of Fig. 1.

As most clearly seen at Fig. 2, in the lower wider portion of the post are made two long narrow recesses *t t*, each having a comparatively-short narrower part at the upper part 90 and a long wider portion thence downwardly, which wider portion is subdivided centrally by a metallic partition-like bar or thin strip 10, so as to form practically two recesses or oblong depressions, which I have marked, 95 respectively, 8 and 9. The lower end of each of these recesses is abruptly narrowed by the inclined side wall 11, that performs the function of a cam, while the surface above at 12 (where the wider portion of the recess is nar- 100 rowed into the part where I have placed the letter *t*) in like manner has a cam action, as I will presently explain.

When the pin-carrier frame is in the elevated position shown in dotted lines at Fig. 105 2, the projecting antifriction-rollers *u* (see Fig. 6) are in those grooves marked 9, and if the said frame be caused to descend to the position shown in full lines at Fig. 2 these rollers will be acted upon by the cam-surfaces 110 11, so as to force the levers 6 6' from the position in which they appear in dotted lines to that shown in full lines, which by the spreading apart of their lower ends effectuates a spreading apart of the slats or strips compos- 115 ing each pair *a b*, &c., of the pin-carrier, because (see Figs. 4, 1, and 2) of these lower ends of 6 6' being flexibly connected, as shown, to the metallic lugs or narrow plates *v* and *w*, that are respectively fastened to the ends of 120 the strips *a* and *b*, and because when these strips are spread apart those of each other set must move likewise, all the strips being connected in the manner hereinbefore described with the longitudinally-sliding bars *i j* of the 125 pin-frame.

When the carrier-frame, with its laterally-movable slats spread apart, is elevated, the rollers *u* travel up in grooves 8 until they contact with the cam-surfaces 12, which force 130 them farther apart, while they continue their upward travel until they get into the grooves at *t*, which effectuates a spreading apart of the upper ends of levers 6 6' and consequently

a forcing nearer together (or into their normal position) of the pin-carrier strips of each pair by the closure of the lower ends of said levers.

5 The two dotted circles $u u$ at Fig. 2 illustrate the positions to which the antifriction-rollers have to ascend to have the mechanism act as just explained, and by reference now to the dotted-line bent-out positions of the
10 upper end portions of the metallic devices 10 and to Fig. 6 of the drawings it will be understood that when each roller contacts in its ascent with the cam-surface 12 it bends the end of device 10 into the position indicated by the dotted line at Fig. 2, the said
15 device 10 being disconnected from the bottom of recess t from the point c upward (see Fig. 6) and being preferably cut to weaken it at the proper portion and possessing sufficient
20 spring or resilience when thus bent to fly back (when released from roller u) to its normal position, in which it serves to force the said roller in its descent to pass the other side of plate 10 and always descend in groove 9.
25 It is important to have the machine provided with this (or some other) means to insure this mode of operation, as otherwise when the pin-setter frame in its highest position, loaded with a whole set of pins, should begin its descent the tendency of the inserted pins to
30 wedge apart the strips of each pair $a b$, &c., might cause the levers to spread apart at their lower ends and the rollers to follow down toward and into groove 8, thus letting the pins
35 fall through their bottomless receptacles or else perhaps cause the rollers to catch on top of the dividing-partition between grooves 8 and 9.

40 The counterbalancing - weight 9 is made (after a well-known fashion) with a series of removable parts, so that by removing and replacing one or more of the detachable parts it may have its gravity changed as circumstances may require—as, for instance, if the
45 pin-setter is to be loaded with ten pins the weight must be heavier than when it may be used to carry and spot only three pins in playing "cocked hat." In any case the gravity of weight 9 should be such that when
50 the pin-carrier frame shall have received all the pins to be spotted the said loaded frame will slightly overbalance the weight and hence automatically descend.

I have made the H-shaped frame 2 with
55 lugs $e e$ at each side, which lugs alone engage with the central grooves L (see Fig. 2) of the posts 4, because of the liability (when the frame 2 and post 4 are made of wood) of the working parts to bind by reason of warpage
60 out of shape were the vertical pieces of frame 2 fitted into the grooves L instead of said lugs. However, as to this and many other mere matters of detail the construction shown may of course be varied.

65 In lieu of the means just above described and most particularly illustrated at Figs. 2 and 6 for insuring the descent of the roller u

in the groove 9 and along down on the right-hand side of the vertical partition 10 (see Fig. 2) I propose to employ, if desirable, the
70 means shown at Fig. 9, which consists, essentially, of a gravitating switch device pivoted at a^2 and having its upwardly-projecting blade or arm b^2 made as thin and light as practicable, while its pendent arm c^2 is made heavier and recessed into the upper end portion
75 of the partition d^2 , (which in this case is made of wood,) the construction shown being such that when the oscillatory metallic switch device $b^2 c^2$ shall have been turned on its pivot
80 a^2 into the dotted-line position by the upward movement of roller u over the cam-surface 12 and while said roller is above the upper end of blade b^2 the said switch device will automatically turn into its normal position, (seen
85 in full lines at Fig. 9,) in which its blade b^2 will perform the same function that is performed by the upper resilient end portion of the metallic device 10. (Shown at Figs. 2 and 6.)
90

As in practice it is difficult to make and set up over or combine with the alley-bed the pin-carrying and spotting frame so that all its pin-receptacles will be located exactly concentrically over all the spots s on said bed, I
95 find it desirable, if not necessary, in making said pin-carrier to provide each of the clamping-slats $a b$, &c., where each has the cut-out I, hereinbefore referred to, with a nearly semi-circular metallic socket-like device that is
100 preferably adjustably secured to said wooden slat, and this structural feature of the shown and described mechanism will be best understood by reference now to Figs. 7 and 8, in the former of which I have shown a pair of
105 metallic devices combined with the cut-outs of a pair of slats in vertical central section (with part of a pin carried therein) and in the latter of which I have shown the same combination of parts in top view. In each
110 view one of the metallic devices f^3 is secured to each of the slats a and b , as shown, with its socket-like or pin-holding curved portion depending somewhat below the level of the under sides of said slats, said socket-like portions of the two devices forming a bottomless holder conforming in size and shape to the exterior belly portion of the pin P. (See Fig. 7.)
115

I prefer to make each of the cast-metal
120 parts with perforations $c^2 c^2$ of a diameter considerably greater than that of the bolt e^2 (see Fig. 7) by which the device is held in place, and by providing washers $f f$ at both the headed and the nutted end of said bolt of ample size, as shown, I can adjust the casting f^3
125 horizontally in any direction and to considerable extent in securing it (by means of the bolt e^2 , with its washers and nut) in place on the wooden slat. This capacity of adjustment in the attachable and removable metallic devices is of importance in effectuating
130 the perfect placement of each of the socket-like devices so that they will all register with

the spots *s* on the alley-bed in setting up or combining with said bed the pin-carrier and spotter, and it is, furthermore, very useful in the event of any one or more of the receptacles subsequently getting out of register with one or more of the bed-spots *s*, in which case the securing-nuts h^2 of any of the bolts e^2 may be loosened, the socket-like devices adjusted, and then resecured in place on the slats. I therefore consider it important in carrying my invention into effect to employ this detail of construction.

In view of the foregoing explanations and the disclosures of the drawings a brief description will now suffice to make plain the general operation of the machine.

The normal position of the pin carrier and depositor is the highest one to which it is inevitably carried and at which it is held when empty by the weight 9, which in its lowermost position rests on a suitable stop or support—as, for instance, at R, Fig. 1—and in this normal position the slats of the several sets of bars *a b*, &c., are closed up or are in their nearest-together condition. When it is desired to spot a whole set of pins that have been bowled down, the pit-boy picks up the pins and deposits them in the socket-like bottomless receptacles I, and when all of them shall have been so deposited the carrier-frame, with its load of pins, automatically descends (if there be any failure to go down on account of some undue friction or binding in the working parts the pit-boy can, by pressing down on the cross-bar of frame 2, enforce its descent) until the bottom of all the pins contact with the surface of the alley-bed, when by pushing the frame down to its lowermost limit of motion the descent of the antifriction-rollers *u* along on the cam-surfaces 11 (see Fig. 2) and into the position there illustrated will cause the bars of each pair of pin-carrying slats to be spread apart sufficiently to permit the ascent of the frame to its normal position, which ascent will of course immediately occur by reason of the weight 9, now relieved of the counteracting-weight of the spotted and released pins. The receptacles I of the pin-setter being located exactly over—that is, in the same imaginary axial line as that of—the spots *s* (see Fig. 3) on the alley-bed, and these receptacles by reason of their socket-like shape (corresponding to the tapered lower portions of the pins) operating to “center” the pins, so to speak, thrown into or placed in them, it follows that the pins will always be exactly spotted. This is the great desideratum with the players, as without having all the pins properly spotted the expert player cannot make the count he should get by a given play or bowling of a ball, and so far as my knowledge goes no pin-setter prior to mine has been capable of perfect operation and at the same time of such simple construction, so durable, and so easy of manipulation as to be practically satisfactory to those who build and use machines for spotting the pins on a bowling-

alley. In the event of only four or five pins being knocked down with two balls the pit-boy may respot them by hand.

Having now so fully described the construction and operation of my improved machine that those skilled in the art can make and use pin-spotters embodying the same either in part or wholly, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pin-spotter of the type shown and described, the combination, with a pin-carrying frame composed of sets of bars having socket-like, bottomless, receptacles for the pins and adapted to have its pairs of pin-carrying bars move laterally, to either hold, or release, the pins; means for elevating said pin-carrying frame; and means for causing it to move vertically, up and down, of levers, pivotally arranged, in pairs, at either side of the frame, with the lower ends of each pair coupled to the laterally-movable ends of one set of said bars; and groove-cams, with which the upper ends of said levers engage and which operate to oscillate said levers, to make them properly move the bars of said set; all substantially as and for the purposes set forth.

2. In a pin-spotter of the type shown, the combination, with the vertically-movable pin-carrier frame; and means for guiding it during its up-and-down movements, of the variable counterbalancing-weight; whereby the loaded frame will just overbalance the suspending-weight, with either a greater, or a less number of pins, accordingly as said weight is varied; substantially as hereinbefore set forth.

3. In a pin-spotter, of the type shown, the combination, with the vertically-movable frames of the pin-carrier; and uprights adapted to be mounted on the side buffers of an alley, as specified, and to act as guides, or ways for said movable frames, of a suitable weight operating to lift said frames, after the spotting operation shall have been performed; the oscillatory levers each pivotally mounted on one of the said frames and having their lower ends connected with the laterally-movable slats of the pin-holder proper, as specified; and groove-cams, in the said uprights, with which the upper, rolled ends of said lever connect, and which operate the latter; all in substantially the manner and for the purposes hereinbefore set forth.

4. In a pin-spotter of the type shown, the combination, with the cam-groove, or cam-recess, of the upright 4, in which travels the roller of the lever 6, the partition 10; and an automatic switch device connected with the upper end of said partition and operating for the purpose hereinbefore set forth.

In witness whereof I have hereunto set my hand this 29th day of November, 1899.

CHAS. J. OLSON.

In presence of—

F. GOLDENBOGEN,
J. EHRENPREIS.