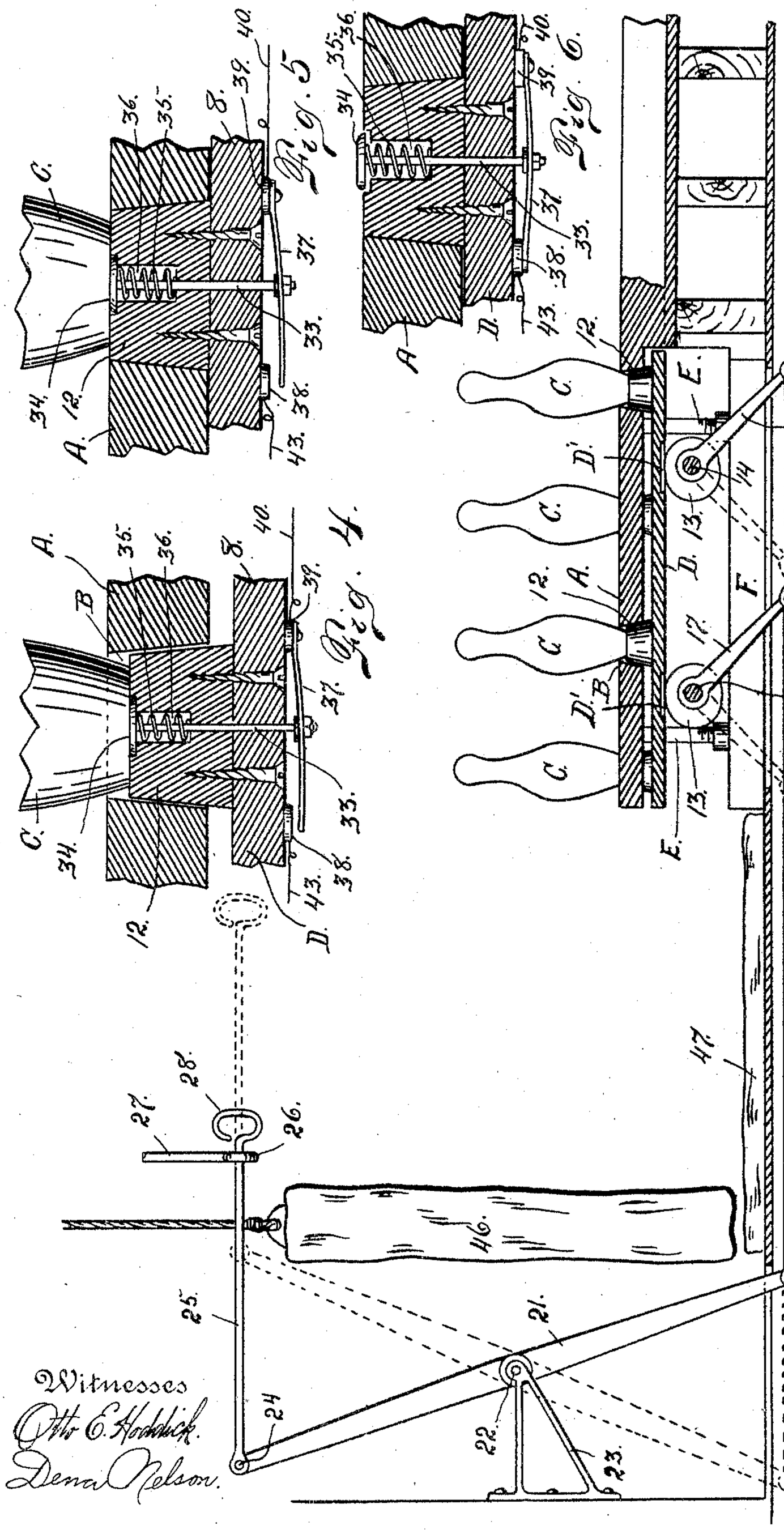
No. 779,999. PATENTED JAN. 10, 1905.

P. A. HABERL.

BOWLING ALLEY.

APPLICATION FILED FEB. 27, 1904.

3 SHEETS—SHEET 1.



Witnesses
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Dena Nelson.

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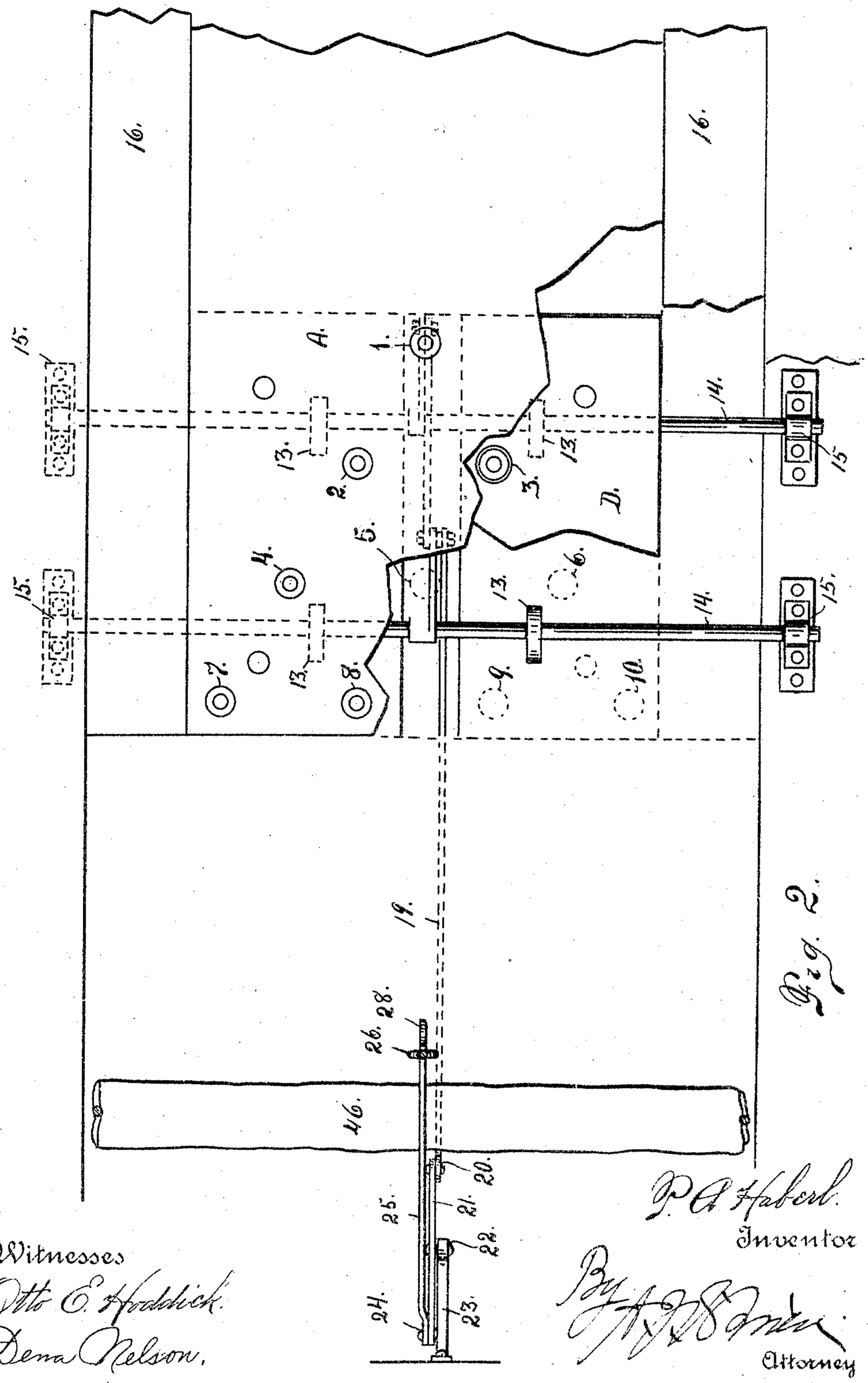

Fig. 2.

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3 SHEETS—SHEET 3.

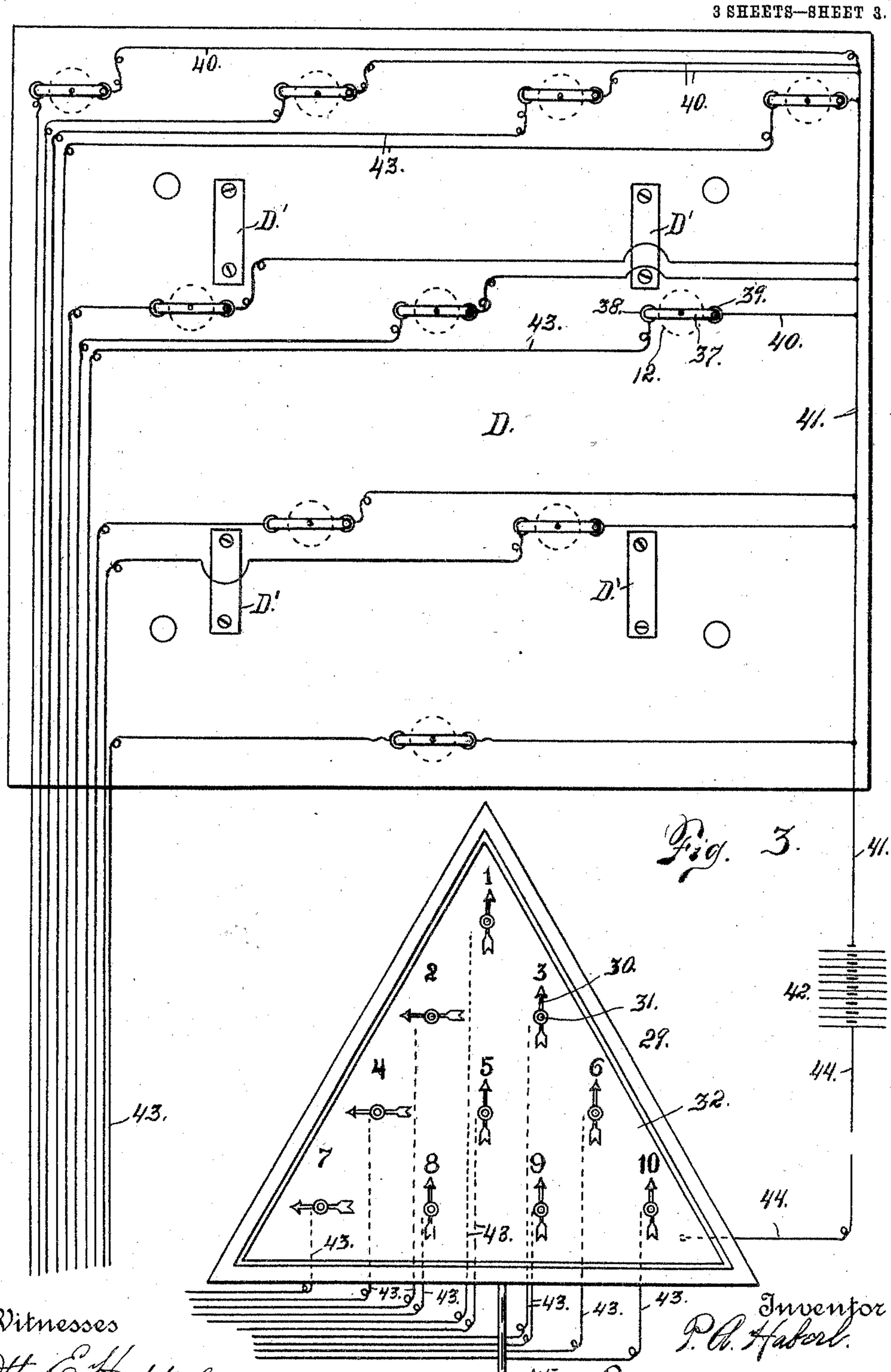

Fig. 3.

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Fig. 7.

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By H. W. Dunn

Atty.

No. 779,999. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

PAUL A. HABERL, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO LEOPOLD KABIS, OF CHEYENNE, WYOMING.

BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 779,999, dated January 10, 1905.

Application filed February 27, 1904. Serial No. 195,691.

To all whom it may concern:

Be it known that I, PAUL A. HABERL, a citizen of the United States of America, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Bowling-Alleys; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in bowling-alleys.

My improvements relate to means to facilitate the proper and exact placing of the pins and also to an electrical connection whereby the knocking down of the pins is clearly indicated by the position of pointers mounted in suitable proximity to numbers corresponding with the numbers of the spots upon which the pins are placed.

The invention will now be described in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a section taken through an alley equipped with my improvements. Fig. 2 is a top view of the same with parts broken away. Fig. 3 is an underneath view of the pin-supporting platform, showing the electrical connections. Fig. 4 is a section taken through the pin-supporting platform, the parts being shown on a larger scale and in position when the movable member of the pin-platform is in its lowermost position. Fig. 5 is a similar view showing the movable member of the platform in the raised position. Fig. 6 is similar to Fig. 5, except that the pin is removed and the electrical circuit closed. Fig. 7 is a detail view of an annunciator arranged in the shape of a triangle corresponding with the shape of the portion of the pin-platform upon which the pins are placed and having numbers arranged to correspond with the numbers of the pin-spots of the platform.

The same reference characters indicate the same parts in all the views.

Let A designate the pin-platform, which is provided with openings of sufficient size to receive the lower extremities of the pins C. Mounted below this platform is an auxiliary member D, vertically movable on guide-pins E, connected with a base F. The auxiliary part D is provided with lugs 12, adapted to enter the openings B from below. These lugs are preferably frustum-shaped to correspond with the shape of the openings B. During the operation of placing the pins in position upon the platform the auxiliary member D is at its lowest position of movement, leaving recesses or spaces above the tops of the lugs 12 to insure the proper placing of the pins. As soon as this is accomplished the part D is raised to the position shown in Figs. 5 and 6, whereby its lugs 12 are made to completely fill the openings B, whereby the lower extremities of the pins are raised to a position flush with the upper surface of the platform A. This raising of the member D is accomplished, as shown in the drawings, by means of eccentric cams 13, mounted on rock-shafts 14, journaled in suitable boxes 15, located beyond the gutters 16 of the alley. As shown in the drawings, there are two rock-shafts 14 and four cams 13. To the central part of each of the rock-shafts is made fast a crank-arm 17. These two crank-arms are connected by a link 18. The lower extremity of one of the crank-arms is also connected with one extremity of a rod 19, the opposite extremity of the latter being connected, as shown at 20, with a lever 21, fulcrumed at 22 upon a stationary bracket 23. The extremity of the lever 21 remote from the rod connection 20 is connected, as shown at 24, with a horizontal pull-rod 25, passing through the eye 26 of a guide-hanger 27. The rod 25 is formed at its free extremity into a handpiece 28 for convenience of manipulation.

When the movable member D of the pin-platform is in its lowermost position, (shown in Fig. 1,) the cams 13 are in the position shown by full lines in the same figure. When,

however, it is desired to raise the member D to the position shown in Figs. 5 and 6, the pull-rod 25 is moved to the dotted-line position, thus throwing the lever 21, the rod 19, and the crank-arms 17 to the dotted-line position in Fig. 1. This brings the portions of the cams 13 farthest from their rock-shafts into engagement with the part D, thus raising the part to its uppermost position and bringing the lower extremities of the pins flush with the upper surface of the platform A, as heretofore explained. The pins are then ready for use.

In order that the knocking down of the pins may be accurately indicated, an annunciator 29 of ordinary construction is employed. This annunciator is provided with arrow-shaped indicators 30, pivoted at 31 upon the board 32 in the usual manner. A vertical rod 33 passes through the movable-platform part D and through the center of each lug 12, terminating at its upper extremity in a button 34. Below this button and surrounding the rod 33 is a coil-spring 35, whose upper extremity bears against the under side of the button and whose lower extremity engages the bottom of a socket 36, formed in the lug and having its upper extremity open and shouldered to receive the button when the latter is depressed to the position shown in Figs. 4 and 5. The tension of the spring 35 is so regulated that the gravity of the pins C will force the button downwardly against the tension of the spring, allowing the lower extremity of the pin to occupy a position flush with the upper surface of the platform. The downward movement of the rod 33 incident to the pressure of the pin C thereon forces a spring 37 downwardly away from a contact 38, whereby the electrical circuit is broken. The extremity of the spring 37 remote from the contact 38 is secured to another contact, 39, the two contacts being insulated from each other. It may be assumed that the part D is composed of dry wood, which makes a reasonably good insulator, or the two contacts may be insulated from each other in any other suitable or convenient manner. The electrical circuit is best illustrated in Fig. 3 of the drawings, in which it is shown that each contact D is connected, by means of a wire 40, with a main circuit-wire 41, leading from one pole of an electrical source 42, while a wire 43 leads from each contact 38 to the annunciator, the latter being connected with the other pole of the electrical source 42 by means of a conductor 44. It is not believed necessary to go into further detail with reference to the construction of the annunciator, since nothing is claimed specifically thereon. This annunciator is provided with a push-rod 45 for throwing the pointers 30 to their normal position after their normal position has been changed by the knocking down of the pins.

Assuming that at the beginning of the game the pointers 30 are all in the vertical position, as soon as the pins on the spots "2," "4," and "7" have been knocked down the electrical circuit will be closed and the three pointers designated adjacent the numerals "2," "4," and "7" on the annunciator-board are made to occupy the horizontal position by the closing of the circuit, and when all of the pins have been knocked down all of the pointers will be in the horizontal position. These, however, may be quickly returned to their normal or vertical position by the upward movement of the rod 45.

Attention is called to the fact that the positions of the pins in Fig. 2 of the drawings are designated by the numerals employed in Fig. 7 to designate the annunciator-pointers, since these pointers are arranged in the same manner as the pins when set up for use in a bowling-alley.

In the rear of the pin-platform I have shown the regular hanging cushion, (designated 46,) as well as the pad 47, the latter being only shown in Fig. 1 and omitted in Fig. 2 of the drawings. The movable member D is provided with wearing-plates D', which are engaged by the cams 13. These plates prevent the cams from wearing a recess in the under side of the part D, which it is assumed is composed of wood.

Having thus described my invention, what I claim is—

1. The combination of a pin-platform provided with openings, a movable member located below the openings and provided with lugs or projections adapted to enter the openings of the pin-platform, separated contacts suitably mounted on the movable member below the pin-platform, electrical conductors secured to one set of contacts and adapted to span the space between the two sets of contacts, circuits in which the said contacts are located, push-rods mounted on the electrical conductors and passing through the movable members and their lugs or projections, the upper extremities of the lugs being provided with recesses, coil-springs located in the recesses and surrounding the push-rods, the latter having heads engaged by the upper extremities of the springs, the springs normally acting to raise the heads of the rods above the surface of the pin-platform whereby the conductors are moved to control the circuits, the tension of the springs being so regulated that the gravity of the pins will depress the heads of the rods and change the circuit-controlling position of the conductors.

2. The combination of a pin-platform provided with openings, a movable member located below the openings and provided with lugs or projections adapted to enter and fill the openings of the pin-platform, separated contacts mounted on the movable member and insulated from each other, electrical conductors secured to one set of contacts and adapted

to span the space between the two sets of contacts, circuits in which the said contacts are located, push-rods connected with the electrical conductors and passing through the movable member and each of its lugs or projections, the upper extremities of the projections of the movable platform being recessed to receive coil-springs which surround the push-rods, the upper extremities of the rods being enlarged to form a bearing for the upper extremities of the coil-springs, the tension of the springs normally being such as to raise the heads of the rods above the upper surface of the pin-platform, and move the conductors to the circuit-closing position, the weight of the pins being such as to depress the push-rods and break the circuits when the pins are in place.

3. The combination with an annunciator, and electrical circuits connected therewith in operative relation, of a pin-supporting platform provided with rods passing therethrough, the upper extremities of the rods having push-button heads, the platform being provided with recesses below the heads of the push-buttons and through which the rods pass, coil-springs located in said recesses and normally acting to raise the heads of the rods above the upper surface of the pin-platform, separated contacts mounted on the lower surface of the platform, electrical conductors connected with the lower extremities of the push-rods and adapted to bridge the space between the two sets of contacts when the heads of the rods are uppermost, the tension of the springs being so regulated that the weight of the pins will depress the push-rods when the pins are in place and break the circuits, while when the pins are knocked down the push-rods will assume the circuit-closing position with reference to the contact-bridging conductors.

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

PAUL A. HABERL.

Witnesses:

LEOPOLD KABIS,

A. J. O'BRIEN.