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ELECTRIC SWITCH FOR BOWLING ALLEYS

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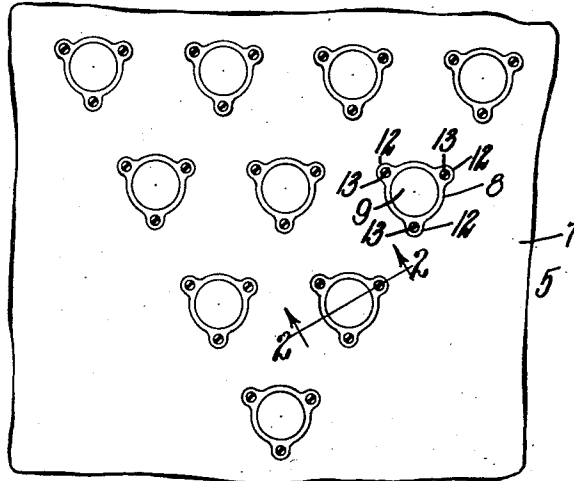
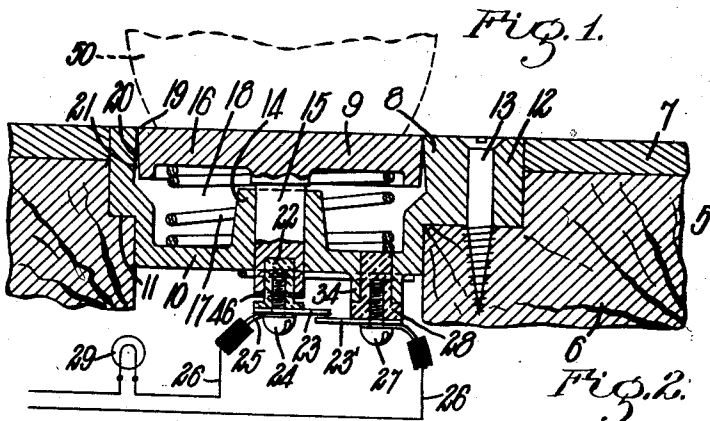
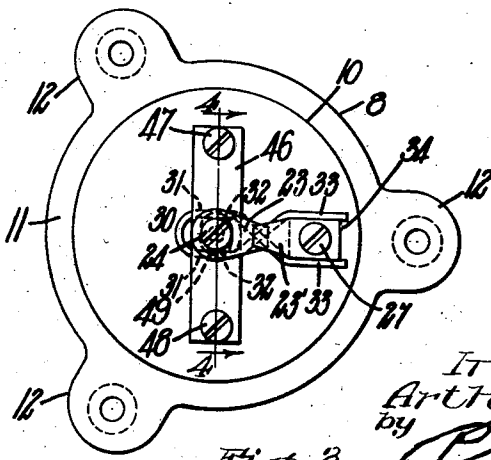
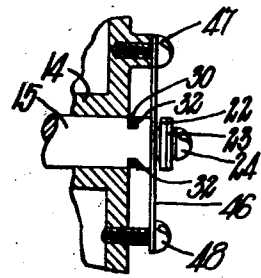


Fig. 3.

Fig. 4.

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ELECTRIC SWITCH FOR BOWLING ALLEYS

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1 Claim. (Cl. 200—85)

This invention relates to an electric switch for bowling alleys, the object of the invention being to provide a switch of novel construction adapted to be electrically connected to a suitable device which will indicate when all of the ten pins are correctly positioned at the lower end of a bowling alley and, furthermore, to indicate, when a play or plays have been made, how many and which ones of the bowling pins still remain standing.

To these ends the invention consists in an electric switch for bowling alleys as hereinafter described in the specification and particularly pointed out in the claim.

Referring to the drawing:

Fig. 1 is a plan view of a portion of a bowling alley with ten of the supports for bowling pins and their respective casings indicated therein.

Fig. 2 is an enlarged sectional elevation taken on the line 2—2, Fig. 1, illustrating an electric switch for bowling alleys embodying my invention including one of the bowling pin supports, its casing, and a portion of its electric circuit to the lamp.

Fig. 3 is an enlarged underneath plan view of the bowling pin support and its casing, together with the contact plates whereby the electric circuit is closed or broken.

Fig. 4 is an enlarged sectional elevation taken on the line 4—4, Fig. 3, and broken away.

Like numerals refer to like parts in the several views of the drawing.

In the drawing, referring to Figs. 2 and 3, 5 is a portion of the bowling alley floor consisting of a wooden portion 6 and a top panel 7. 8 is a casing for a bowling pin support 9.

The casing 8 consists of a cylindrical body portion 10 provided with an annular shoulder 11 and three ears 12 projecting radially outward from the body portion 10 of the casing. These ears are of sufficient thickness to project through the panel 7 forming the upper surface of the bowling alley 5 and into the wooden portion 6 thereof and are fastened firmly in position by means of screws 13. The casing 8 has a boss 14 projecting upwardly from the bottom thereof and forming a bearing for the shank 15 of the support 9. A flange 16 is provided at the upper end of the shank 15 and is normally supported by a spring 17 in the position illustrated in Fig. 2, that is, with the upper face of the flange of the support flush with the upper face of the casing 8 and also flush with the upper face of the bowling alley or of the panel 7 adjacent thereto. The spring 17 encircles the boss 14 and is located

in a chamber 18 provided in the body portion of the casing 8. The upper edge 19 of the flange 16 touches the adjacent edge of the orifice 20 in which the flange 16 is positioned and the periphery of the flange 16 is bevelled inwardly whereby a clearance space 21 is provided between the flange 16 and the casing 8, so that dirt or dust from the upper face of the casing or from the upper face of the bowling alley may pass downwardly into the chamber 18 and thus the support 9 can always be brought back by the spring 17 to its normal position, that is, with its upper face flush with the upper face of the casing 8 and that portion of the bowling alley 5 adjacent thereto.

The lower end of the shank 15 has a plug 22 of insulating material fixed therein and a contact plate 23 preferably of phosphor bronze is fastened by a screw 24 to said plug 22 and thus to the shank 15 of the support 9, the plug 22 thus forming a part of the shank 15. One end 25 of an electric wire 26, forming a part of an electric circuit, is clamped to the contact plate 23 by the screw 24. Another contact plate 23' is positioned beneath and in alignment with the contact plate 23 and is fastened by a screw 27 to an insulating plug 28 which is fast to the bottom of the body portion 10 of the casing 8. The screw 27 clamps the other end of the wire 26 to the contact plate 23'. The wire 26 forms an electric circuit in which is introduced an electric lamp 29. In order to accurately position the support 9 in its normal position and to prevent the same from rotating so that the contact plates 23 and 26 will always be positioned in proper relation to each other, the shank 15 of the support 9 is prevented from rotating by a looped wire 30, the opposite sides 31 of the loop 30 engaging oppositely disposed transversely extending slots 32 in the shank 15. The free ends 33 of the looped wire engage opposite sides of a boss 34 which extends downwardly from the bottom of the body portion 10 of the casing 8.

Some bowling pins are heavier than others and therefore it is necessary to provide means for regulating the resistance to depression of the support 9 by the weight of the bowling pin resting thereon. To regulate this depression or, in other words, to increase or diminish the upward spring action on the support, a flat spring 46 is provided in addition to the spring 17 as illustrated particularly in Figs. 2, 3 and 4. Said flat spring 46 is fastened at one end rigidly to the bottom of the casing 8 by a screw 47 and adjustably fastened at its other end by a screw 48 to said cas-

ing. The spring 46 is slotted at 49 to receive the plug 22 which forms a part of the shank of the pin holder. The spring 46 bears against the bottom of the metallic portion of the shank 15 so that by adjusting the screw 48 more or less pressure may be brought by the spring 46 against the shank 15 of the holder 9 to regulate the resistance to depression of the holder according to pins of different weights that may be supported thereon.

It will be seen that when the parts are in the positions illustrated in Fig. 2 and the springs 17 and 46 are holding the support 9 in its normal position that the looped wire 30 will abut against the bottom of the body portion 10 of the casing and when this is the case the top surface of the support 9 will be flush with the top surface of the casing 8 and of the bowling alley floor adjacent thereto.

The operation of the device hereinbefore specifically and to some extent in general described is as follows:—Assuming a pin 50, partly indicated by dotted lines in Fig. 2, to be positioned upon one of the supports 9. The upper end of the support 9 it will be understood is of a width not less than the diameter of the lower end of the bowling pin 50 to be placed thereon. When the bowling pin is placed on the support 9, the springs 17 and 46 will yield and the support will descend sufficiently to cause the contact plate 23 to engage the contact plate 23' which previously were separated by a slight distance. As soon as the contact plates 23 and 23' are in engagement the circuit through the wire 26 will be closed and the lamp 29 lighted, thus illuminating its respective numeral from 1 to 10 as the case may be of a suitable indicating device for which the

switch mechanism of this invention is provided. Assuming that the pins 50 are placed in position upon their respective supports then all of the numerals 1 to 10 of the indicator will be illuminated. This indicates to the player that all of the pins are in position. After a play has been made and certain pins knocked over and removed from the alley, their respective supports will return to their normal positions illustrated in Fig. 2, thus the electric circuit of each of these supports which have returned to their normal positions will then be broken and their corresponding lamps put out, leaving only those numerals of the indicator illuminated which correspond to the pins which have not been knocked over and removed from the alley.

I claim:

An electric switch for bowling alleys having, in combination, a casing, a spring-actuated support for a bowling pin comprising a shank slidable vertically in said casing and a flange on the upper end of said shank of a width not less than the diameter of the lower end of said bowling pin, a positioning member on said shank comprising a resilient looped wire engaging the flat surfaces of a pair of oppositely disposed transversely extending slots on said shank, whereby the support is prevented from rotating, the free ends of said positioning member crossing each other and engaging a stop on the bottom of the casing, said wire engaging the bottom of the casing when the support is in its normal position, an electric contact member on the lower end of said shank, and an electric contact member positioned beneath and in alignment with said first-named contact member.

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