

Feb. 11, 1964

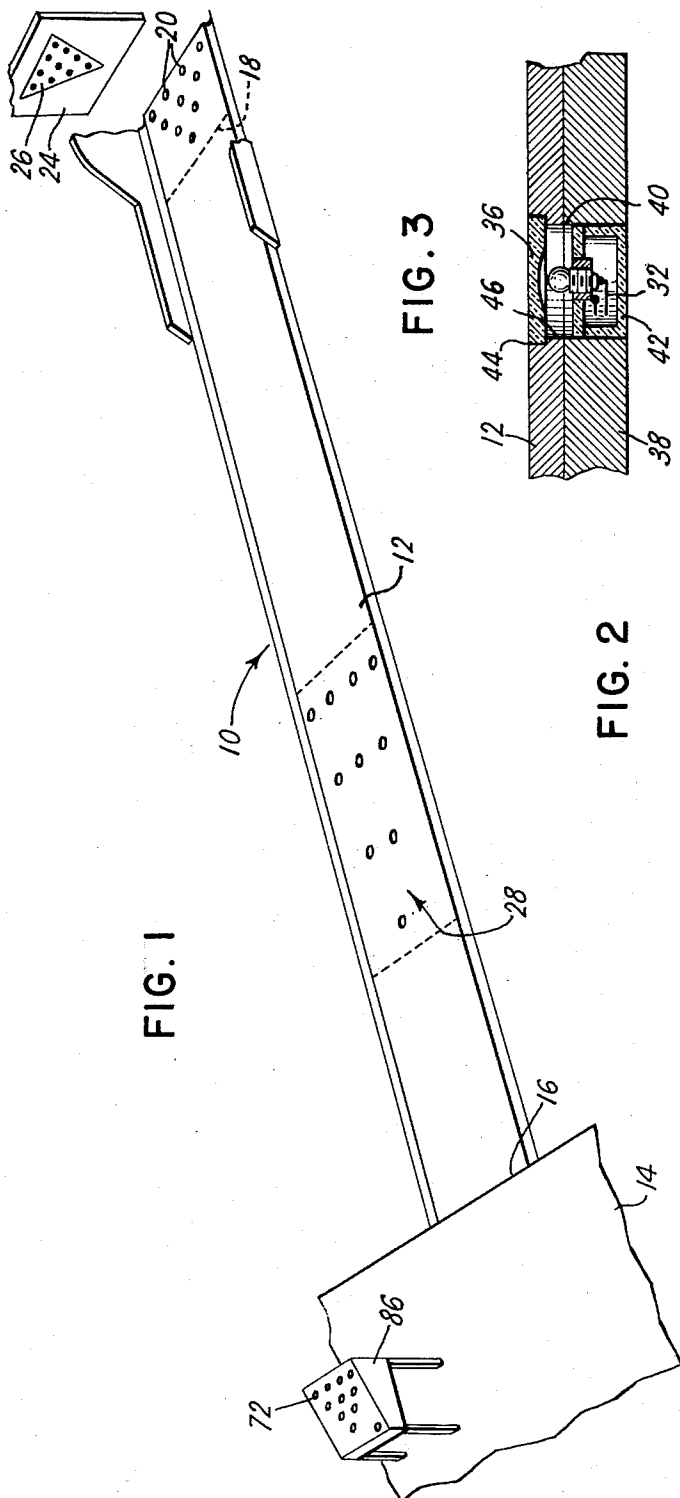
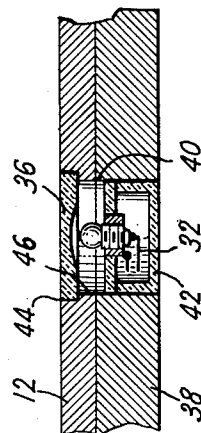
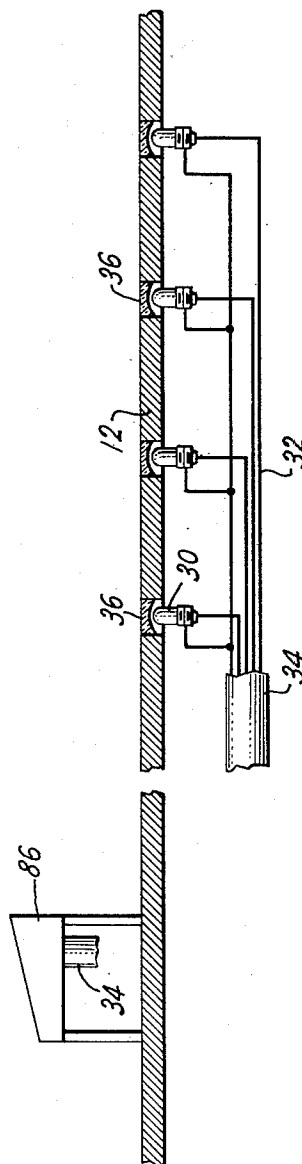
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3,120,956

MANUALLY OR AUTOMATICALLY ILLUMINATED BOWLING GUIDE

Filed Aug. 3, 1961

3 Sheets-Sheet 1



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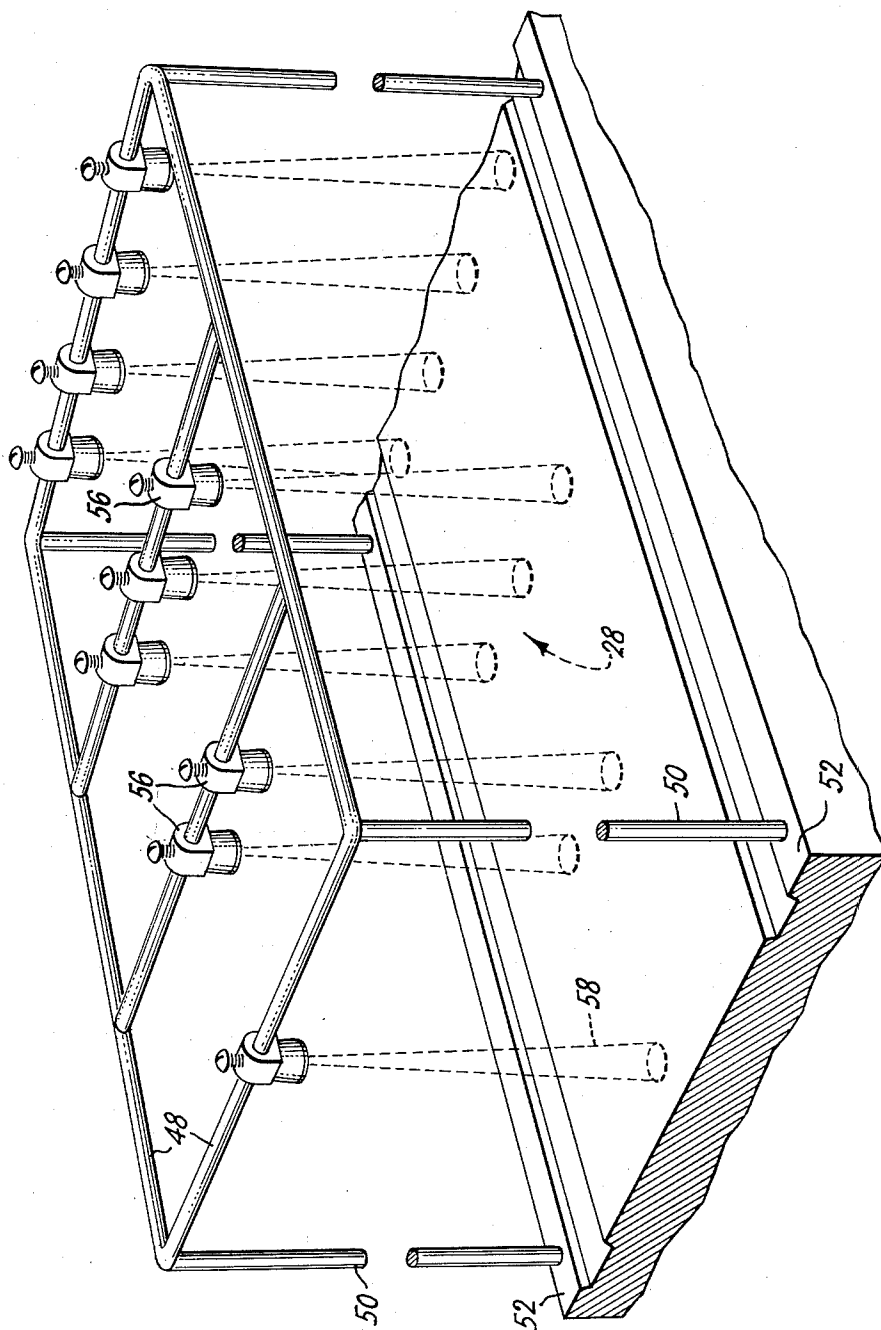
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FIG. 4



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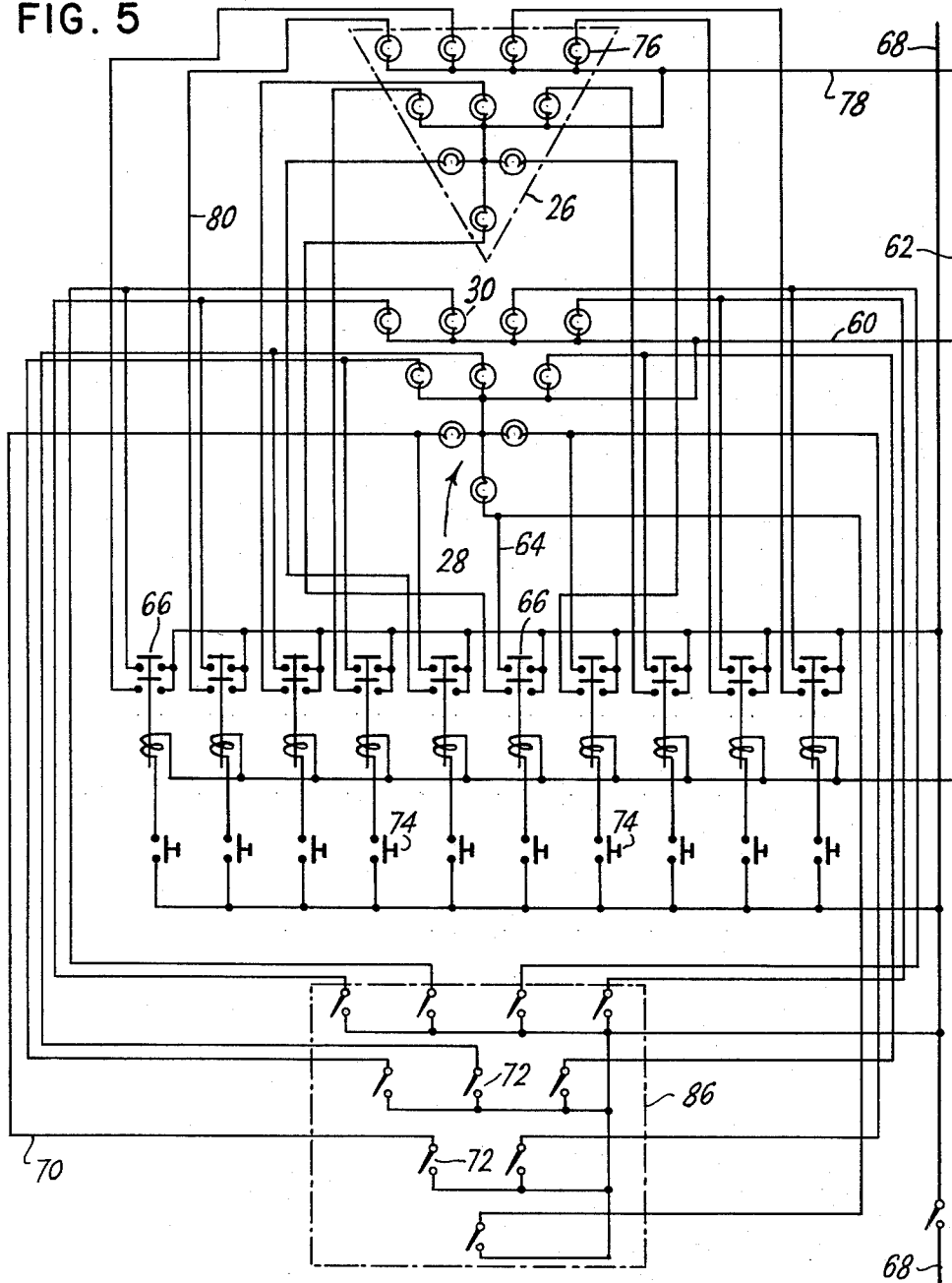
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FIG. 5



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MANUALLY OR AUTOMATICALLY ILLUMINATED BOWLING GUIDE

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1 Claim. (Cl. 273-54)

This invention relates to a bowling alley and has as its general purpose the object of providing improved means for assisting the bowler in determining the position of the standing tenpins and in accurately delivering the ball to strike them.

A bowling alley comprises a playing surface of about 60 feet in length, bounded at one end by an approach zone, from which the balls are thrown, and at the other end by a deck portion on which the tenpins are arranged in a triangular pattern. Since the game is widely played and is described fully in the available literature, a detailed analysis of the game of bowling and the methods employed to strike the tenpins is unnecessary. However, it is to be remarked that a great deal of skill is required to actually deliver the ball to down the largest number of pins possible. This skill requires the combination of physical dexterity, form, aim, and control. The paramount purpose of this invention is to provide means which will assist the bowler to have proper aim and control of the ball.

In taking aim and controlling the movement of the ball, the bowler must first determine the relationship of the pins standing on the pin deck. In particular, after the first ball is thrown and a number, but not all, of the pins are downed, there is required a good deal of visual skill to determine which pins have remained standing and the relationship they are in to each other. Since the standing pins are at least 60 feet distant from the bowler, this is often somewhat difficult even to the bowler with considerable skill. A second factor involved is the finding of a specific target at which to throw the ball. Since a rolling ball, on an extremely smooth surface such as the playing bed of a bowling alley, cannot, without a great deal of skill, be made to assume a direct path, aiming at the pins is not satisfactory. Because the ball more likely takes a curved path, it is therefore often necessary and advantageous to provide a mark or spot, close to the approach zone, at which the bowler can aim.

In the past, the art has concentrated separately and individually on each of the two problems enumerated above, with some, but not complete success in satisfying each. As representative of what the art has done, reference is made to U.S. Patent 2,338,733, Patterson et al., dated January 11, 1944, and U.S. Patent 2,375,663 to Kennedy, dated May 8, 1945.

The first mentioned patent describes automatic means for determining the presence of a standing pin and of indicating such a presence on a display board associated with the alley. According to the patent and practice, the display is made at the end of the alley just above the pinsetting mechanism. This display is a two dimensional screen in a plane perpendicular to the floor of the alley. Because of its position and dimensional limitations, it is impossible for the bowler to obtain a good visual depth perspective of the standing pins and except for the indication of which pins are standing, the bowler cannot

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determine from his location in the approach zone the proper relationship of the standing pins.

The second mentioned patent, which is also widely practiced, describes the use of a plurality of spots or wedges embedded in the wood of the approach zone, delivery zone and the bed of the alley itself. The sights, made of wood or other similar material, are of contrasting color to that of the wood of the alley and are outstandingly visible to the bowler at all times. These means are undoubtedly helpful in assisting the bowler to take aim, but they, nevertheless, have a certain degree of difficulty and annoyance to their use. This is caused primarily by the fact that the markings or sights are relatively small and some distance from the foul line, resulting in their being difficult to sight on and distinguish individually by the moving bowler. Above all, the marks or sights are constantly visible, although not clearly or easily distinguishable to the bowler, causing him to divert his concentration from the precise target or the tenpins which he desires to strike.

It is therefore the object of this invention to provide, directly on the bed of the alley, forward of the approach zone, a single triangular array of illuminated sights which can be operated in combination to automatically indicate the presence of a standing pin at the end of the alley and selectively to provide aiming points or sights for the bowler. Specifically, the objects of the present invention include; the provision of an array of pinfall indicating means which gives to the bowler a three dimensional perspective view of the pins standing on the pin deck; the provision of selectively actuatable points or sights on which to take aim; the provision of the combination of the above by means which are normally not observable to the bowler and which will therefore not interfere with or hamper his normal aim.

Thus, in accordance with the present invention, there is embedded directly in the bed of the bowling alley a triangular array of lamps to provide a three dimensional indicating means, and, having in combination therewith, means for automatically operating the same to indicate the number of standing pins and means for separately selectively operating the lamps in any combination desired by the bowler. In another form of the invention, the lamps are suspended above the bed of the alley as spotlights, producing illuminated sights directly on the bed.

A complete description of the present invention follows. From it the advantages and objects noted above, as well as others will become apparent. In the description, reference is made to the accompanying drawings 50 where:

FIG. 1 is a fragmentary perspective view of a bowling alley embodying the features of the present invention;

FIG. 2 is an enlarged sectional view of the alley of FIG. 1 in side elevation;

FIG. 3 is a sectional view of a portion of a bowling alley showing a method of embedding a lamp therein;

FIG. 4 is a fragmentary perspective view of a bowling alley showing a second form of the present invention;

FIG. 5 is a circuit diagram of the electrical apparatus used in the present invention.

Referring now to FIG. 1 of the drawing, there is shown, for the purpose of understanding the present invention, a tenpin bowling alley, generally designated 10 which is of conventional construction. The alley com-

prises a playing surface or bed 12, of about 60 feet in length, bounded at one end by an approach zone 14 having a foul line 16 from which the balls are thrown and at the other end by the pin deck 18 having a triangular pin spot pattern 20 on which the tenpins are placed. Along both sides of the bed 12, there is provided a gutter to receive and retain within the playing area inaccurately thrown balls. Mounted above the pin deck 18 there is shown diagrammatically a shield 24 covering the pinsetting mechanism (not shown) on which is mounted a pinfall indicating screen 26 referred to previously and as described in U.S. 2,388,733.

In the form of the invention shown in FIGS. 1 and 2, there is embedded directly into the bed of the alley, a triangular array 28 of lamps 30 connected by appropriate wiring 32 through conduit 34 to an electrical control apparatus shown in detail in FIG. 5. The lamps may be mounted in a conventional manner, and are overlaid by transparent or translucent covers 36 of glass, plastic, or similar material, which may be clear or colored, as desired. The covers 36 are polished and smoothed to conform with the surface of the bed 12. The covers 36 should also have substantially the same coefficient of friction as the wood so as not to unduly influence the rolling of the ball or the play of the game.

A particular method of embedding the lamps is shown in FIG. 3. In this figure, the bed 12 of the alley 10 is shown as built upon a sub-flooring 38 which is cut transversely from gutter to gutter 22 as at 40 to form a lateral housing for a receptacle box 42 completely underlying the bed 12. The lamps 30 are mounted in the box 42 in a conventional manner with the lead wires 32 extending laterally out from under the bed 12. In this manner, the receptacle box 42 can be made to accommodate each of the bulbs 30 required for forming at least one lateral line of the array pattern 28 and can be easily removed for repair and replacement of components or bulbs. To provide for the mounting of transparent or translucent covers 36, the alley 12 is formed with a hole 44 having an annular flanged shoulder 45 on which the cover 36 can seat. Cover 36 can be cemented or otherwise secured in the hole 44 in a customary manner; then smoothed and polished to provide a continuously playing surface with the bed 12.

The second form of the invention is shown in FIG. 4. Here the lamps, rather than being embedded in the bed of the alley, are supported or suspended from a rectangular frame 48 mounted above the alley. The frame 48 may be supported by upright members 50 secured within the flooring 52 outside of the side gutters 22 or it may, in the alternative, be suspended from the ceiling of the building by suitable and well known fastening means. In FIG. 4, the lamps are housed in adjustable members 56, which are movable longitudinally and rotationally on the supporting cross bar members of the frame 48. The lamps can then be caused to project a beam of light 58 on the deck of the alley 12 in an array 28 simulating, as in the preferred embodiment, the pattern of the tenpins. The array, however, may be varied within limits by simply moving and/or rotating the embedded lamps to project the light spots where desired, thus increasing the versatility of the invention. Also, the lamps may be provided with variable or exchangeable lenses or other means to modify the width of the light beam 58 if desired. The lenses may be clear or colored.

It is clear that upon the actuation of the lamps of either of the two forms described, there will be provided an array 28 or a partial array of illuminated spots which will give to the bowler a perspective view of the corresponding tenpin array. Since the illuminated spots will be closer to the bowler than the tenpins, and since he will be able to see all ten of the spots when illuminated, no one spot hiding another as is the case with rather large tenpins, the bowler will obtain an accurate picture of the pin deck. It is also clear that each of the sights may

be used when illuminated for a target or aiming point; thus combining in one array all the aids affecting the bowler's aim and control.

FIG. 5, in showing the electric circuitry for operation of the present invention, discloses clearly the manner by which the apparatus described in FIGS. 1-4 is both automatically and selectively actuated. Each of lamps 30 in the array 28 are connected by individual wires 60 to a common ground or negative wire 62. They are also connected by leads 64 through individual selecting relays 66 to a positive wire 68, and by leads 70 to a series of individual manual throw switches 72.

Initially the actuation of lamps 30 is accomplished by the automatic system involving the selecting relays 66 to indicate pinfall only.

The selecting relays are solenoid actuated and operated by a series of individual micro-switches 74. Micro-switches 74 are similar in structure and function to those described in the aforementioned Patterson Patent 2,338,733 for sensing the pinfall in a bowling alley and are associated with the pinsetting mechanism to be directly operable by the pins standing on the deck. The micro-switches 74 are adapted to sense the presence of pins standing on the deck 18 of the alley 12 and to make in response thereto. A further description of the operation of the micro-switches or their operation is felt to be unnecessary in this specification since they are fully described in the patent to which reference is made. When micro-switches 74 make, they actuate solenoid relay 66 and light the respective lamps 30. Thus, the lamps 30 are actuable automatically to indicate the presence of a pin at selective times.

FIG. 5 further shows the combination of the apparatus of the present invention with that of the pinfall indicating screen 26 (shown in FIG. 1) of the Patterson et al. patent. Ten lamps 76 are mounted on screen 26, representative of each pin position on deck 18, which are connected by individual leads 78 to the common ground or negative wire 62 and by individual leads 80 to the selecting relay 66 to be actuated automatically with the lamps 30 of the array 28 embedded in or suspended over the alley bed 12. Thus the pinfall indicating screen 26 may be combined with the present invention to give additional aid to the bowler. Note, however, that as explained the lamps 76 on screen 26 are not used to provide aiming targets for the bowler.

The actuation of lamps 30 as a bowling aid is manually accomplished independently and alternatively with the aforementioned automatic system.

The manual throw switches 72 are mounted on a panel board or table 86 which is conveniently located near the approach zone of the alley 14 of the alley (FIG. 1) so as to be operable by the bowler himself. Each of the manual switches 72 are connected directly to lamps 30 by-passing the micro-switches 74 in order that the lamps 30 may be activated independently of the automatic pinfall indicating control.

The manual switches 72 are arrayed on table 86 in a triangular pattern for the convenience of the bowler. As explained previously, by selectively lighting any one or a combination of lamps 30, the bowler may choose a target suitable to his own personal needs and abilities. The array 28 of lamps 30 is so dispersed on the bed 12, that any angle of delivery can be developed from the foul line 16 by sighting on or between one or more of the lights 30 and, if desired, on the pins standing on the pin deck.

It will now seem apparent that the object of providing for an automatic pinfall indicator and a more versatile aid to the bowler, one which is capable of being selectively actuable, has been obtained and that the other objects set forth above, and those made apparent from the preceding description, are efficiently attained. As various changes may be made in the form, construction and arrangement of the parts herein without departing

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from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

I claim:

In a bowling alley having a flat playing surface, an approach zone at one end, a pin deck at the other end for supporting a plurality of pins in a predetermined array, and automatic pinsetting means, with respect to said playing surface, including means for sensing, during play, the pins standing in said array, the combination of a plurality of lights, in an array corresponding to said predetermined pin array, said lights being mounted to illuminate particular portions of the playing surface between said approach zone and said pin deck, means responsive to said pin sensing means for automatically actu-

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ating selected ones of said lights corresponding to the pins standing in said array and independent alternate means for manually actuating one or more of said lights to provide selective targets directly on said playing surface for aiding the bowler in aiming at said pins.

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