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BOWLING ALLEY FOR THE BLIND

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2 Sheets-Sheet 1

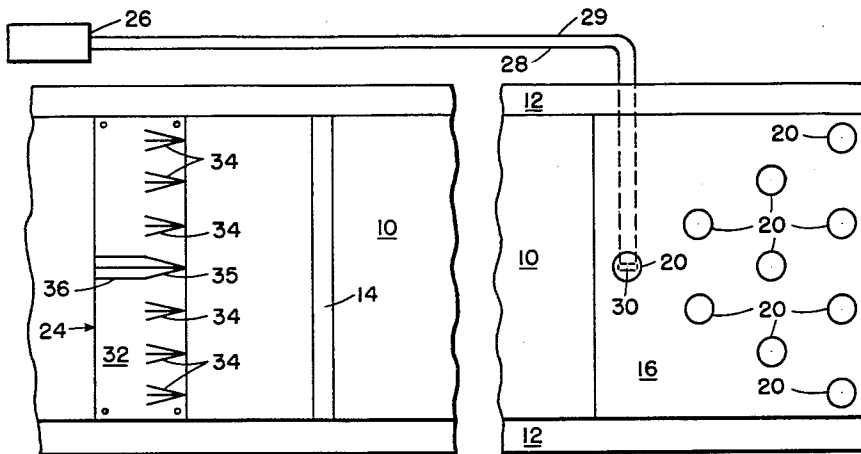


Fig. 1

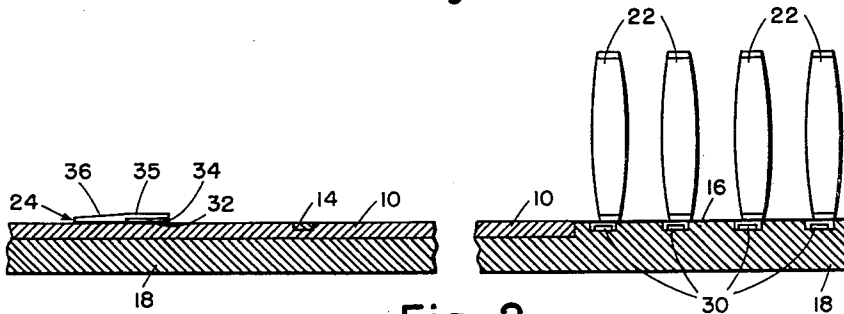


Fig. 2

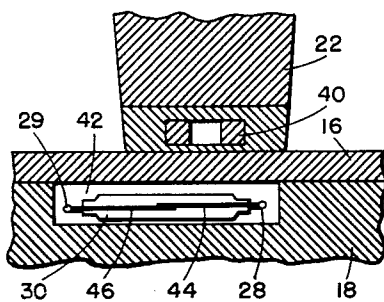


Fig. 3

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BOWLING ALLEY FOR THE BLIND

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6 Claims. (Cl. 273-37)

This invention relates to a bowling alley suitably equipped for use by blind people, without the usual need for assistance by people having normal vision.

Although some blind people, by considerable patience and effort, are able to bowl reasonably well, they nevertheless are quite unable to do so without aid from people with normal vision to make note of the number of pins left standing and to keep the usual scoring records. Another and superficially less obvious problem of the blind bowler, but one which is especially troublesome and is not readily helped by people who can see, is that of taking proper position to throw the ball. This position, in fact, has three aspects—distance from the foul line, distance from each side of the alley, and direction of the axis of the alley.

The principal object of this invention is to overcome these problems expeditiously, and in a relatively simple fashion, so that the blind bowler can carry on the game without assistance and with reasonable assurance of good results, and thus have the independence necessary to enter competitive play. Another object is so to provide these means for modifying an ordinary bowling alley that it is not affected for its usual use by those who are not blind. Other objects will appear from the disclosure which follows.

Briefly stated, these objects are attained by providing a magnet in the base of each pin; switch means directly under the location spot of each pin and preferably just beneath the replaceable fiberboard sheet on which the pins are placed, the switch means being ordinarily in open position but being caused to close by the proximity of the magnets; a pin indicator near the bowler's position, electrically connected to the switches, and provided with means responsive to the opening and closing of the switches for making manifest to the human touch the presence or absence of a pin over each such switch; and positioning means located on the floor of the alley, near the foul line, adapted to make manifest to the human touch (more particularly to the feet of the bowler) the distance to the pins, the bowler's location between the sides of the alley, and the line of direction toward the pins—or more particularly the center line of the lengthwise axis of the alley, and the direction of that line.

This invention will now be described in more detail in connection with the accompanying drawings, which are intended to be illustrative rather than limiting, and wherein:

FIG. 1 is a plan view of a bowling alley arranged in accordance with the present invention;

FIG. 2 is a vertical sectional view of the same;

FIG. 3 is a vertical sectional view of a single pin and its magnet and the associated switch;

FIG. 4 shows schematically the electrical circuit for this invention;

FIG. 5 is a perspective view of the pin indicator box; and

FIG. 6 shows, partly in section, vertically, a detail of the arrangement of one of the indicators in the pin indicator box.

In FIGS. 1 and 2 there is shown a bowling alley having conventional hardwood flooring 10, gutters 12, foul line 14, and pin platform 16, the latter being a thin laminated fiberboard or other suitable wear-receiving surface which can be easily replaced when worn. Floor-

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ing 10 and platform 16 are supported by base 18, of softer wood. Platform 16 carries the usual markings 20 indicating where each pin 22 is to be placed in playing position. Note that the pins 22 are shown in position in FIG. 2, but are not shown in FIG. 1.

In accordance with the present invention, the alley is also provided with positioning means 24, which is spaced from the foul line in a direction opposite from the pins, and with pin indicator 26 (see FIG. 5) connected through leads 28, 29 with switches 30 located one under each pin 22. Only one such lead pair is shown in FIG. 1; similar leads go to each switch 30. Details of the arrangements of pins and switches appear in FIG. 3, and the circuitry is shown in FIG. 4.

Positioning means 24 comprises a flat strip 32, conveniently of rubber or other suitable base medium, to which are fixed raised elements or ridges 34, 35—one opposite each row of pins. The central such element, 35, comprises ridges 36 extending at right angles to the axis of strip 24 and parallel to the axis of the bowling alley. Strip 24 may be attached to the alley floor in any suitable manner, e.g. by bolts or screws as shown. Alternatively it may be recessed in the floor, although that involves cutting into the floor with consequent inconvenience when the alley is to be used by people with normal vision. By use of bolts or the like, the positioning means 24 may be placed or removed as desired, without otherwise affecting or damaging the alley. Various other arrangements and configurations of the ridges are possible, as long as they fill the three criteria of making it possible for the blind bowler to ascertain, by foot touch, (a) distance from foul line and pins, (b) location of center of alley, i.e. equidistant between the gutters, and (c) direction toward the first pin, i.e. the direction of the center line, longitudinally, of the alleys.

The blind bowler, by touching his feet along the ridges on strip 24, can readily tell his position opposite each row of pins, and also, through ridges 36, can ascertain both the center of the alley and the exact direction of the pins, inasmuch as ridges 36 point directly toward the first pin. In this latter connection, it is helpful, though not necessary, to provide ridges 35, 36 which are somewhat higher than ridges 34, as shown in FIG. 2.

The arrangement of the pins and switches is shown in detail in FIG. 3. In the base of each pin 22 is located a magnet 40, here shown as a ring or doughnut-shaped magnet, although any other type of magnet which can actuate the switch 30 may be used. The magnet is located adjacent the bottom end of each pin; or at both ends if the pin is double-ended, as in the case of candle pins. Switch 30 is positioned in a small cut-out space 42 in base 18, so that platform 16 covers it, and it can easily be removed or changed upon removal of platform 16. In the particular form of switch shown, point 44 of the switch is in fixed position, and point 46 is movable to closed position against point 44 under the influence of the magnet 40. The magnets 40 in each pin—and in each end of the double ended pins—and the switches 30, are so arranged that no matter which pin is placed upon which spot 20, the switch 30 beneath it will at once be brought to closed position.

The circuitry of which the switches are a part is shown in FIG. 4. Power from supply lines 50 (e.g. a regular 110 volt line) controlled by switch 51 is passed into transformer 52 and reduced to a suitable voltage, e.g. about 6 volts. An indicating light 54 is included in the circuit; its purpose is explained hereinafter. Leads 56, 58 are connected to the two ends of the secondary winding of transformer 52, and each switch 30, in series with a solenoid 60, is placed in a circuit across these two leads. Three such circuits, indicated as A, B and C, are shown in FIG. 4, it being understood that there are as many

circuits as there are pins. In each circuit, the switch points 44, 46 are connected with leads 28, 29 respectively, lead 28 being connected with lead 58 and lead 29 through solenoid 60 with lead 56. Each solenoid 60 loosely surrounds a metallic core 62 which moves upwardly when current passes through the solenoid. When current is cut off, core 62 drops to position against base 64. This is further illustrated in FIG. 6, wherein core 62 is shown carrying an indicating point 66. The shoulder 65 on core 62 prevents the latter from rising too high; a stop 67 may also be provided for the purpose. In the presence of magnet 40, the switches in circuits A and B are closed and cores 62 are raised, while in circuit C, no magnet is near the switch and hence the latter is open, no current flows through the circuit, and core 62 is in down position.

A convenient arrangement for the indicating points 66 is shown in FIG. 5. As there shown, pin indicator 26 comprises a box 70 supported on an upright 72 through which pass the lines 50 from the power supply and the cable 74 containing leads 28, 29, from each switch 30. The circuitry of FIG. 4 is housed in box 70. Switch 51 and light 54 are mounted at any convenient points. Those who can see can tell whether or not the power is on by looking at light 54, while those who are blind can tell by feeling the light—i.e. it is warm if on and cold if off. The points 66 which project above the top surface of box 70 through holes 76 indicate which pins are standing. Thus, in FIG. 5, rods corresponding to pins 4, 7 and 9 are projecting, indicating that those three pins are still standing in the alley.

Holes 76, of which there is one for each pin, are conveniently arranged in the same relative position as the pin arrangement in the alley. However, any other arrangement may be used, as may be most convenient. It is also obvious that the box arrangement shown in FIG. 5 may be replaced by any other suitable device for containing the circuitry of FIG. 4, and it may be placed at some other location, with respect to the bowler's position, than that shown in FIG. 1—so long as the blind bowler can conveniently ascertain, by his sense of touch, the relative up or down position of each point 66 and the correlation of each point with each pin position 20.

At the beginning of each frame, with all the pins 22 in place, the blind bowler places himself in the correct position by sensing with his feet upon the ridges of positioning means 24. Directional and side-to-side positions, and distance from the foul line, are thus readily ascertained, as already mentioned hereinabove. The bowler can check upon the positioning of all the pins by placing his fingers over the top of box 26 in the area of holes 76, to ascertain that each point 66 is projecting and that therefore each pin 22 is in its place in the alley. The bowler then proceeds to bowl. After each ball he examines the top of box 26 with his fingers to ascertain both the number of pins left standing and their position. Having this information he can direct each succeeding ball in the right direction. If and when all the pins are knocked down, there will be no points 66 projecting upward through holes 76. Neither will there be if the switch 51 is open or if the power from lines 50 is shut off, but in these two instances the light 54 will be off and hence cold, which fact can be easily ascertained by the blind bowler. Upon resetting pins 22 in place after each frame, all points 66 will project above the top of box 26 as before, and the bowler is ready to begin bowling the next frame.

Various modifications in this system, within the scope of the appended claims, will be evident to those skilled in this art. For example, each switch may be so constructed as to open (instead of to close, as above shown) when the magnet in the pin base is above it, whereupon the points 66 will all be in down position when the pins

are all standing in place, and each projecting rod will indicate a pin knocked down or displaced. If desired, conventional rectifier means may be included to provide D.C. current in circuits A, B, C.

What is claimed is:

1. In a bowling alley system adapted to be used by blind bowlers, a set of bowling pins, a magnet in the base of each pin, switch means positioned beneath each pin spot and below the alley surface, each of said switch means being adapted to be actuated only when one of said magnets is directly above it, a plurality of electric circuits each controlled by one of said switch means, indicating means each of which is movable by the passage of current through one of said circuits, there being one of said indicating means for each of said pins, and foot-positioning means on the alley floor adjacent the foul line, on the opposite side thereof from the pins and spaced away from said line, said foot-positioning means and each of said indicating means being accessible to, and the position thereof being ascertainable by, the touch of the bowler.

2. In a bowling alley system adapted to be used by blind bowlers, a set of bowling pins, a magnet in the base of each bowling pin, switch means positioned beneath each pin spot and below the alley surface, each of said switch means being actuable to closed position by the presence of one of said magnets directly above it, a plurality of like electric circuits each controlled by one of said switch means, power means for supplying electric power to said circuits, a solenoid in each of said circuits, an indicating point associated with each solenoid and arranged to be moved by the passage of a current through said solenoid, container means surrounding said solenoids, said container means being provided with a hole adjacent each of said indicating points, each of said holes and said indicating points being so arranged that the point projects through its associated hole only when the switch in the corresponding circuit is closed, and foot-positioning means adjacent the foul line and spaced away therefrom on the side opposite said pins and substantially at floor level, said foot-positioning means and said indicating points being accessible to, and the position thereof being ascertainable by, the touch of the blind bowler.

3. In a bowling alley adapted to be used by blind bowlers, positioning means substantially at floor level and detectable to the touch of the feet of the blind bowler and comprising a series of raised elements arranged in a row extending transversely of the alley on the opposite side of the foul line from the pins, and spaced away from said line, one of said elements being located opposite each pin position.

4. A bowling alley in accordance with claim 3 further characterized in that said raised elements are in the form of ridges which extend generally longitudinally of the alley.

5. A bowling alley in accordance with claim 3 further characterized in that the central one of said raised elements is more prominent than the others of said elements.

6. Bowling alley system in accordance with claim 1 further characterized in that said foot-positioning means comprises a series of raised elements arranged in a row which extends transversely of the alley.

References Cited in the file of this patent

UNITED STATES PATENTS

559,352	Becker	May 5, 1896
1,569,260	Cahill	Jan. 12, 1926
1,987,000	Cahill	Jan. 8, 1935
2,202,674	Seaman et al.	May 28, 1940
2,452,288	Blando	Oct. 26, 1948
2,628,098	Bauerschmidt	Feb. 10, 1953