July 24, 1962 D. H. MARX 3,046,012

BOWLING ALLEY

Filed July 1, 1959 2 Sheets-Sheet 1

FIG. 1

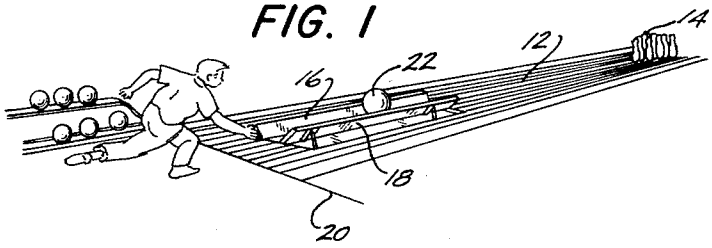



FIG. 2

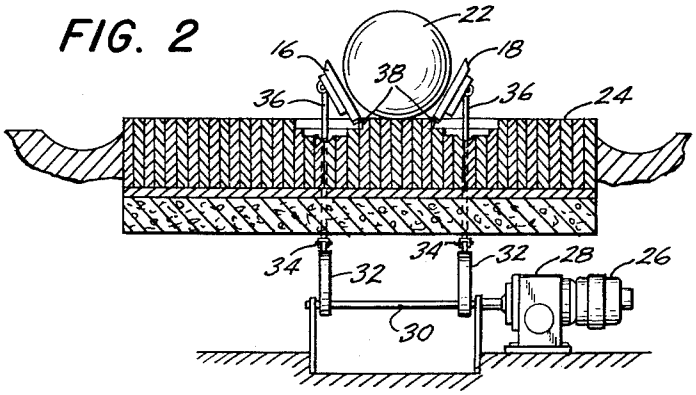



FIG. 3

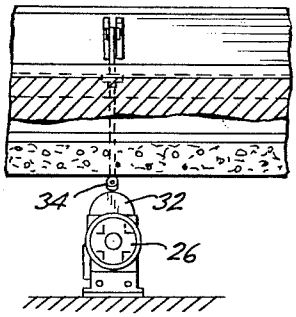



FIG. 4

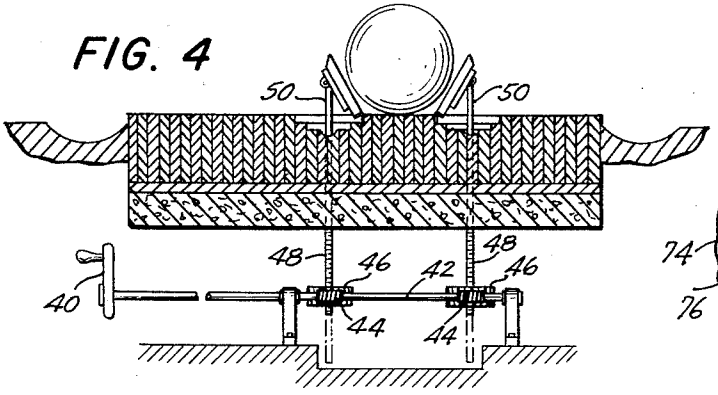



FIG. 5

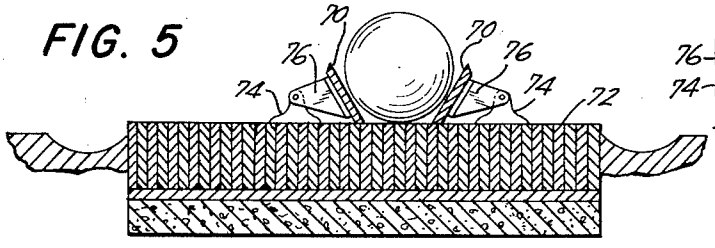
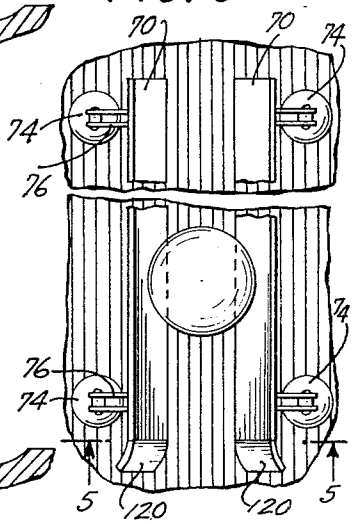



FIG. 6




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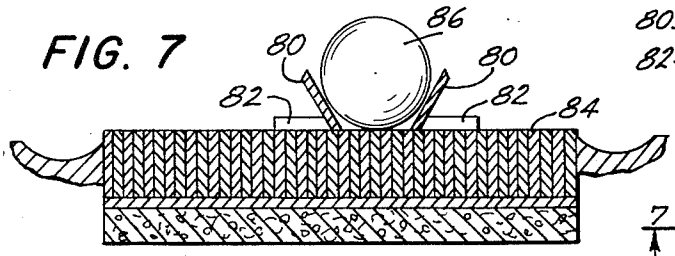
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July 24, 1962 D. H. MARX 3,046,012

BOWLING ALLEY

Filed July 1, 1959 2 Sheets-Sheet 2

FIG. 7



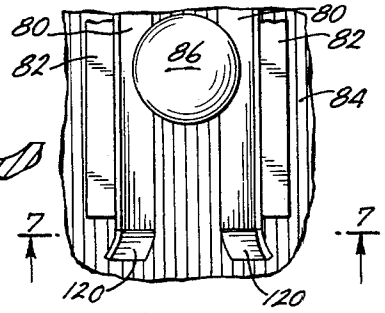




FIG. 8

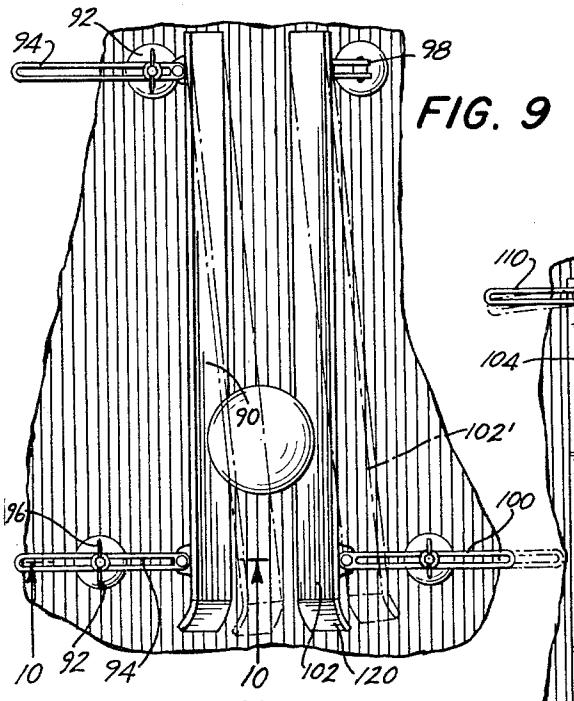
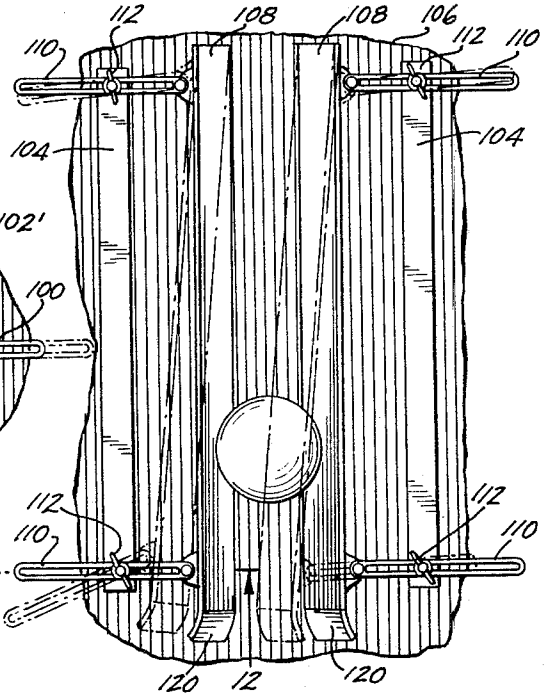



FIG. 9

FIG. 11



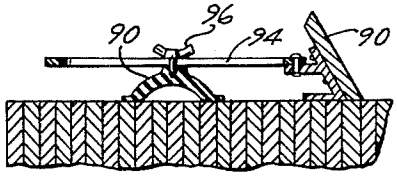
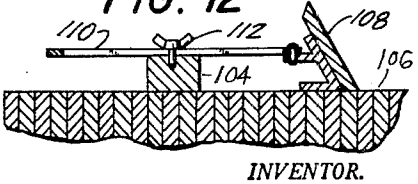




FIG. 10

FIG. 12



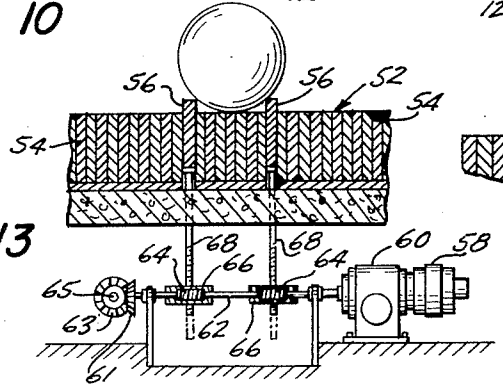




FIG. 13

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3,046,012

# BOWLING ALLEY

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24 Claims. (Cl. 273—51)

This invention relates to bowling alleys, and more particularly to a lane intended for use by beginners.

A beginner finds it difficult to roll a bowling ball to the pins, and many times the ball runs into the gutter adjoining the alley. Some beginners have a tendency to throw the ball toward the pins, so that it bounces rather than rolls on the alley. In many places separate practice alleys or lanes are set aside for use by beginners, in order to take the brunt of the damage, and to avoid marring the remaining alleys. Sometimes a beginner may do so badly as to become discouraged and give up the game.

The primary object of the present invention is to overcome the foregoing difficulties. For this purpose I provide an alley or lane with guide means to guide the bowling ball at the start. The guide means may be made adjustable so that the degree of guidance may be gradually reduced until the bowler requires no further assistance. In all cases the construction of the alley and auxiliary apparatus preferably is such that the alley may be used as a regular alley when desired, instead of as a beginner's alley.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, my invention resides in the bowling alley and guide means and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings, wherein:

FIG. 1 is a perspective view explanatory of the invention;

FIG. 2 is a transverse section through a bowling alley embodying features of my invention;

FIG. 3 is a fragmentary longitudinal section;

FIG. 4 is a view similar to FIG. 2, but showing a modification;

FIG. 5 is a view similar to FIG. 4, but showing guide means in the form of an accessory which may be added to a conventional alley;

FIG. 6 is a plan view of the guide means shown in FIG. 5;

FIG. 7 is a view similar to FIG. 5, but showing a modification;

FIG. 8 is a fragmentary plan view of the same;

FIG. 9 is a plan view showing guide means using suction cups, as in FIG. 5, but with adjustable links for altering the position of the guide means;

FIG. 10 is a section taken approximately in the plane of the line 10—10 of FIG. 9;

FIG. 11 is a plan view of guide means using weighty bars, as in FIG. 8 but with adjustable links between the guide means and the bars;

FIG. 12 is a fragmentary section taken approximately on the line 12—12 of FIG. 11; and

FIG. 13 is a section similar to FIG. 4, but showing still another form of the invention.

Referring to the drawing, and more particularly to FIG. 1, the invention comprises a bowling alley or lane generally designated 12, having the usual gutters and return track. The pins 14 are set up as usual, either by hand or by machine. In accordance with the present invention, two spaced guide means 16 and 18 are located near the foul line 20 and are directed longitudinally of the alley toward the pins 14. The guide means 16 and 18 project above the surface of the alley, and are so spaced as to receive and guide a bowling ball 22 toward the pins in order to aid a beginner.



The beginner is aided primarily by control of direction of the ball. He is also aided because the need to place the ball safely between the guide means helps discourage him from throwing or bouncing the ball, and instead encourages the smooth rolling of the ball along the surface of the alley.

Referring now to FIGS. 2 and 3, it will be seen that the guide means 16 and 18 form a part of the structure or bed 24 of the lane. The guide means are movable upwardly, and the installation preferably includes control means to raise or lower the guide means between a lowered or retracted position in which they are flush with and form a part of the flat surface of the bowling alley, and a raised position shown in FIG. 2 in which they act as guides for the ball.

In FIGS. 2 and 3 the control means may be remotely controlled, there being an electric motor 26, reduction gearing 28 which preferably provides a very low-speed output. The output shaft 30 carries cams 32 cooperating with follows 34 at the lower ends of rods 36 leading to the guide means.

In the specific arrangement here shown, the guide means are boards which are recessed into the bowling alley structure, and which are hinged at their inner edges as shown at 38. The control rods 36 lead to the middle or outer portions of the boards. The connection is preferably transversely slidable, as well as pivoted. The amount of rise of the guide means varies the effective closeness of the guidance provided thereby. In highest position they may provide a three point contact, and may just touch the ball while it rests on the alley. By lowering the guides, clearance is provided at the sides, and this clearance is increased as the guides are lowered further. This is done as the beginner improves, until finally the guides when recessed flush into the alley, provide no guidance or restraint at all.

The use of an electric motor for control is convenient because only a small excavation is needed. The control switches may be located in a favorable and readily accessible location.

The control rods 36 may be placed halfway along the length of the guide means, or as shown herein may be near one end. In the latter case similar control means preferably are provided near the other end, and these are geared together, as by shafts and gearing, or by chain-and-sprocket mechanism, or the like, to insure simultaneous and equal movement at both ends of the guide means.

Other control mechanisms may be used, and in FIG. 4 I show a manually operable crank 40 turning a shaft 42 carrying worms 44 meshing with worm gears 46 which threadedly receive upright screws 48 formed on non-rotatable control rods 50. Thus, rotation of the crank 40 will gradually raise or lower the guide means. It will be understood that a remotely controllable electric motor may be substituted for the crank 40, and conversely a crank may be substituted for the motor 26 in FIG. 2.

It is not essential to adjust the guide means by tilting the same. Referring to FIG. 13, I show an alley 52 which is built up in the usual way of boards 54 disposed vertically or edgewise. The guide means are a spaced pair of boards 56 which are arranged for slidable movement in vertical direction, relative to the remaining boards. The control means in this case is much like that previously described, there being a motor 58 and reduction gearing 60 driving a shaft 62. The latter has worms 64 meshing with worm gears 66 which threadedly receive non-rotatable control rods 68. The latter are secured to the boards 56, and it will be evident that operation of motor 58 in one direction or the other will raise or lower the guide means 56. Bevel gears 61, 63 may drive a shaft 65 leading to a similar mechanism at the

other end of the guides, for simultaneous and equal movement.

On reflection, it will be evident that here again the amount of rise of the guide means varies the effective closeness of the guidance provided thereby. The guides **56** may be raised until they just touch the ball as it rests on the alley. The guidance then is a maximum. However, by lowering the guide means, clearance is provided at each side of the ball, and the degree of guidance is reduced. Finally, when the guide means have been lowered to a position flush with the alley, there is no guidance at all.

As so far described the invention requires special building of a portion of the alley. Guide means having a length of say ten feet are adequate for the present purpose. However it is not essential to build the guide means into the alley, and instead they may take the form of an accessory which is added above the surface of a normal bowling alley. This accessory includes means to hold the guide rails per se in desired position.

One such arrangement is shown in FIGS. 5 and 6 of the drawing. Sloping boards **70** act as the guide means, and these are anchored in position on the alley **72** by means of suction cups **74**. In the present case four suction cups are shown, and the guides **70** are connected to the suction cups by supports **76**. When the supports are pivoted as here shown, the guide means may be turned upwardly and outwardly out of the way for most practical purposes, without actually removing the suction cups. However, the entire accessory apparatus may be removed from the alley, leaving it a normal bowling alley.

Another way to hold the guide means in position is to use heavy bars instead of suction cups. Referring to FIGS. 7 and 8, the guide means **80** are mounted on and supported by weighty metal bars **82**. These rest on the alley **84**, and are heavy enough to hold the guide means in position against the pressure of the bowling ball **86**.

In either of the foregoing arrangements the location of the guide means may be changed by physically moving the same on the surface of the bowling alley. Such a change may be desired either to reduce the degree of guidance, or to change the direction of guidance, as for example to help teach a beginner how to roll toward an end pin. To facilitate this, connections may be provided to the holding means such as the suction cups **74** in FIG. 5, and the weighty bars **82** in FIG. 7, and these connections may be made adjustable.

Thus referring to FIGS. 9 and 10 of the drawing, guide means **90** are supported by holding means in the form of suction cups **92**. These are connected by slotted links **94**, the position of which may be locked by means of wing nuts or wing screws **96**. An arrangement with four slotted links will afford adjustment of both the spacing and the direction. If it be desired to adjust only the direction, two of the slotted links may be omitted and may be replaced by a pivotal connection shown at **98** in FIG. 9. In such case a slotted link **100** at the other end will afford a change in direction, as shown by the change from the solid-line position **102** to the broken-line position **102'**.

With three slotted links, as shown in FIG. 9, one may change both the spacing and the direction.

Two, three or four slotted links similarly may be provided when using weighty bars instead of suction cups, and such an arrangement is illustrated in FIGS. 11 and 12 of the drawing. The elongated weighty bars are shown at **104**, and these rest directly on the surface of the bowling alley **106**. The guide means **108** are connected to the weighty bar by means of slotted links **110**. The position of these is adjustable, as by means of wing nuts or wing screws **112**. It will be evident that both the spacing and direction of the guide means may be changed.



The leading or approach ends of the guide means may be provided with sloping approach surfaces, and these may be made of, or may be covered with, a rubber or plastics material having the soft cushioning characteristics of rubber. Such convergent or sloping approach ends are shown at **120** in FIGS. 6, 8, 9, and 11.

In FIGS. 2 and 4 the adjustment is angular. In FIGS. 10 and 12 it is horizontal. In FIG. 13 it is vertical. However, in all cases the effective change in relation to guidance of the ball is horizontal.

It is believed that the construction and method of use of my improved bowling alley and the accessory guide means therefor, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be apparent that while I have shown and described my invention in several forms, changes may be made in the structures shown without departing from the scope of the invention as sought to be defined in the following claims.

I claim:

1. The combination with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, of two spaced guide means having a length which is only a small fraction of the length of the alley and which are located near the foul line and directed longitudinally of the alley toward the pins, said guide means projecting above the surface of the alley and being spaced apart a distance less than the diameter of a bowling ball so as to receive and guide a bowling ball toward the pins in order to aid a beginner, said guide means forming a part of the structure of the bowling alley and being upwardly movable relative thereto, and control means to raise or lower the guide means between a lowered or retracted position in which they are flush with and form a part of the flat surface of the bowling alley, and a raised position in which they act as guides for the bowling ball.

2. The combination with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, of two spaced substantially parallel guide means located near the foul line and directed longitudinally of the alley toward the pins, said guide means projecting above the surface of the alley and being spaced apart a distance less than the diameter of a bowling ball so as to receive and guide a bowling ball toward the pins in order to aid a beginner, said guide means forming a part of the structure of the bowling alley and being upwardly movable relative thereto, control means to raise or lower the guide means between a lowered or retracted position in which they are flush with and form a part of the flat surface of the bowling alley, and a raised position in which they act as guides for the bowling ball, the amount of rise of the guide means serving to vary the effective closeness of the guidance provided thereby, said bowling alley being usable as a regular alley instead of as a beginner's alley when said guide means are retracted.

3. A combination as defined in claim 1 in which the guide means are boards recessed into the bowling alley structure and hinged at their inner edges, and in which the control means raises or lowers the outer edges.

4. A combination as defined in claim 2 in which the guide means are boards recessed into the bowling alley structure and hinged at their inner edges, and in which the control means raises or lowers the outer edges.

5. A combination as defined in claim 1 in which the alley is built up of boards, and in which the guide means are a spaced pair of boards arranged for vertical movement relative to the remaining boards, and in which the control means serve to raise or lower the said guide means.

6. A combination as defined in claim 2 in which the alley is built up of boards disposed vertically or edgewise, and in which the guide means are a spaced pair of said boards arranged for vertically slidable movement relative to the remaining boards.

7. The combination with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, of two spaced guide means having a length which is only a small fraction of the length of the alley and which are located near the foul line and directed longitudinally of the alley toward the pins, said guide means projecting above the surface of the alley and being so spaced as to receive and guide a bowling ball toward the pins in order to aid a beginner, said guide means being accessory means added above the regular smooth flat bowling surface of the bowling alley, together with means to hold the guide means in desired position.

8. A combination as defined in claim 7 in which the holding means and the guide means are relatively adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

9. The combination with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, of two spaced substantially parallel guide means having a length which is only a small fraction of the length of the alley and which are located near the foul line and directed longitudinally of the alley toward the pins, said guide means projecting above the surface of the alley and being spaced apart a distance less than the diameter of a bowling ball so as to receive and guide a bowling ball toward the pins in order to aid a beginner, said guide means being accessory means added above and supported by the regular smooth flat bowling surface of the bowling alley, together with means to hold the guide means in desired position, said guide means and holding means being removable from the alley so that it may be used as a regular alley instead of as a beginner's alley.

10. A combination as defined in claim 9 in which the holding means and the guide means are relatively adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

11. A combination as defined in claim 7 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley.

12. A combination as defined in claim 9 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley.

13. A combination as defined in claim 7 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley, and in which the connections between the guide means and at least some of the suction cups are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

14. A combination as defined in claim 9 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley, and in which the connections between the guide means and at least some of the suction cups are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

15. A combination as defined in claim 7 in which the holding means are elongated weighty bars adapted to rest on the surface of the bowling alley.

16. A combination as defined in claim 9 in which the holding means are elongated weighty bars adapted to rest on the surface of the bowling alley.

17. A combination as defined in claim 7 in which the holding means are elongated weighty bars adapted to rest on the surface of the bowling alley, and in which the connections between the guide means and weighty bars are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

18. A combination as defined in claim 9 in which the holding means are elongated weighty bars adapted to rest on the surface of the bowling alley, and in which the connections between the guide means and weighty bars are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

19. For use with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, two spaced substantially parallel guide means having a length which is only a small fraction of the length of the alley and which are adapted to be located near the foul line and directed longitudinally of the alley toward the pins, said guide means then projecting above the surface of the alley and being spaced apart a distance less than the diameter of a bowling ball so as to receive and guide a bowling ball toward the pins in order to aid a beginner, said guide means being accessory means adapted to rest on the regular smooth flat bowling surface of the bowling alley, together with means to hold the guide means in desired position, said guide means and holding means being removable from the alley so that it may be used as a regular alley instead of as a beginner's alley.

20. A combination as defined in claim 19 in which the holding means and the guide means are relatively adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

21. The combination of claim 19 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley.

22. The combination of claim 19 in which the holding means are suction cups which may be pressed down on the regular surface of the bowling alley, and in which the connections between the guide means and at least some of the suction cups are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

23. A combination as defined in claim 19 in which the holding means are elongated weighty bars adapted to rest on the surface of the bowling alley, and in which the connections between the guide means and weighty bars are adjustable in order to afford adjustment of the spacing or/and direction of guidance of the guide means.

24. The combination with a full size bowling alley of usual dimension for use with pins and balls of usual dimension, of two spaced guide means having a length which is only a small fraction of the length of the alley and which are located near the foul line and directed longitudinally of the alley toward the pins, said guide means projecting above the surface of the alley and being space apart a distance less than the diameter of a bowling ball so as to receive and guide a bowling ball toward the pins in order to aid a beginner.

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