No. 622,653. Patented Apr. 4, 1899.

J. N. McINTIRE.

BOWLING ALLEY.

(Application filed Apr. 13, 1898.)

(No Model.)

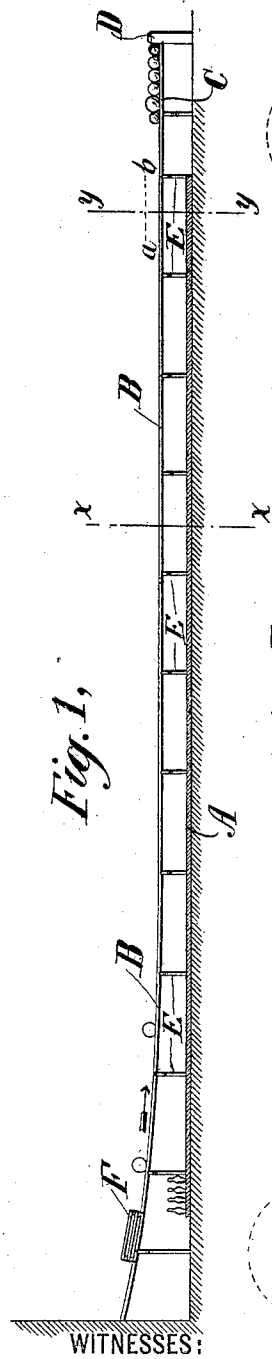


Fig. 1.

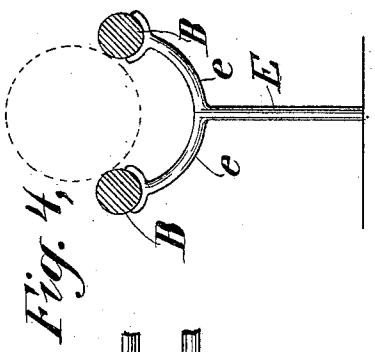


Fig. 4.

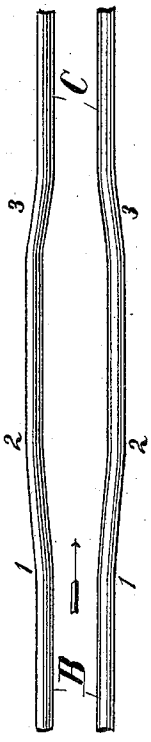


Fig. 5.

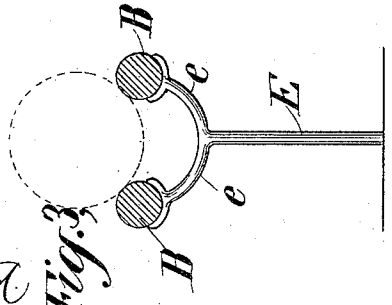


Fig. 3.

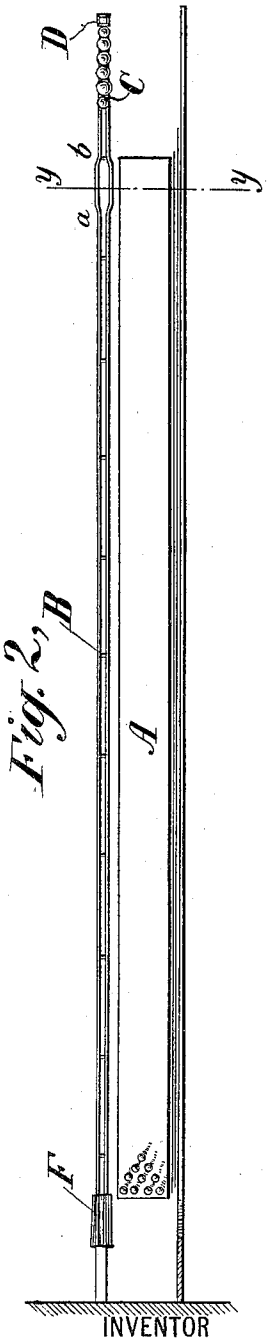


Fig. 2.

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BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 622,653, dated April 4, 1899.

Application filed April 13, 1898. Serial No. 677,426. (No model.)

To all whom it may concern:

Be it known that I, JACOB N. McINTIRE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Bowling-Alleys, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a novel construction of that part of a bowling-alley which is usually called the "ball runway or return-way"—that is, the device the function of which is to return to the players' end of the alley the balls which have been played with and which are picked up out of the pit by the boy who sets up the pins and placed in or on the said ball return-way at the pit end of the latter.

As is well known to those skilled in the art of building bowling-alleys and familiar with their use, the ball return-way is always composed of either a trough or a pair of ways extending from the pit end of the alley to the players' end and arranged at one side of the ballway of the alley or intermediately of two ballways where there is more than one, with its terminal end or that portion where the balls come to rest for use by the players at a suitable elevation from the floor, to be picked up by the player for such use, and with its pit end elevated to a greater degree, said return-way being sloped from the pit end downwardly, so that when the balls are placed thereon at the pit end of the alley they will descend by gravity or roll thence downwardly until they arrive at the players' end of the alley, where the ball first arriving will be stopped against the newel-post or stop-post of the runway and where succeeding balls that roll down from the pit end of the alley will rest in contact with such first ball and with each other, all as well understood.

It is usual, as is well known, to have arranged at the upper portion of the ball return-way what is called a "cage"—*i. e.*, a nearly-semicylindrical receptacle—into which the balls may be hastily thrown or placed by the pit-boys and by which each ball is properly discharged onto the ways of the runway proper, such cages being usually made trough-like or like one-half of a frustum-shaped receptacle.

In the most approved styles of ball return-way the ways on which the balls travel are composed of either bars of hardwood cylindrically shaped or of metallic tubes arranged parallel with each other (usually of a diameter of about two inches) and placed a distance apart of from three and one-half to four and one-half inches.

In the use of ball return-ways it has always been found that unless some means be provided for checking the velocity of the balls as they arrive at the players' end of the alley and land on the terminal the balls in arriving at their destination on said terminal will smash up against each other or come into contact with such severe concussion as to not only seriously wear the balls superficially and rack and strain the runway at the vicinity of the stop-post, but also so as to (in striking each other) soon effectuate a breaking away of the material of the ball at the vicinity of the "finger-holes" therein, thus impairing the usefulness of the balls for bowling purposes, and this serious difficulty it has been sought to overcome (and has been overcome to a certain extent) by the use of various means operating to impede the movements of the rolling balls as they approach the terminal of the runway, or, in other words, to check their speed or motion, so as to make them come to rest and contact with each other on the terminal without injurious effects. A great variety of expedients for this purpose have been devised and used with more or less success in practice, among which are various forms of brakes operating to check the rolling ball as it approaches the terminal of the runway to such an extent that it will pass onto said terminal at a very slow rate of speed, and also a peculiar construction of ball return-way in which the ways after extending obliquely downward from the pit end of the alley (for the purpose of causing the ball to rapidly descend therefrom) have an ascend-

ing or upgrade section or portion up which the balls have to travel just before they land on the higher, nearly level, and "terminal" portion of the runway, this upgrade or upwardly-inclined portion of the runway at the vicinity of the players' end of the alley operating to check the velocity or reduce the speed of the rolling ball, so that the latter will on its arrival at the forward end of the terminal be traveling so slowly as to avoid any serious or very injurious concussive action between either the ball and the stop-post or between the former and other balls at rest on the terminal.

I propose to accomplish the desired end of checking the speed of the balls just before they arrive at their place of final repose on the terminal of the runway by means of a novel construction of the runway which, while it is exceedingly simple, will effectually accomplish the desired end and in such a manner as to have both the rails or ways of the runway and the surfaces of the balls subjected to very little wear and tear in the operation of checking the velocity of the balls as they travel on the runway.

In order that those skilled in the art may understand and practice my invention, I will now proceed to describe my novel construction of runway, referring by letters and figures to the accompanying drawings, which form part of this specification, and in which I have shown my invention carried out in that form in which I have so far contemplated its use in actual practice, though modifications as to the details of construction may of course be made without departing from the spirit of my invention, the pith of which lies in the idea of constructing the ball return-way with its ways or the rods or tubes on which the balls roll simply spread apart and then drawn together again at the vicinity of the players' end of the alley and at a locality such that a ball descending in the usual manner on said ways from the pit end of the alley will just previously to its arrival at the terminal end of the runway pass into the spread-apart portion of the runway, and thus come into contact with said ways at points near the poles of the axis of motion of the rolling ball, this different relationship of the ball to the ways with which it contacts tending to make the ball roll slower, the ball having its bodily movement still further checked as it passes from the spread-apart portion of the ways onto the again contracted portion, which forms the terminal of the runway, all as will be hereinafter more fully explained.

In the drawings, Figure 1 is a side view or elevation of an ordinary bowling-alley comprising or provided with one of my improved ball return-ways. Fig. 2 is top view of the same. Fig. 3 is a detail vertical cross-section, on an enlarged scale, taken in a plane indicated by the dotted line *x x* at Fig. 1. Fig. 4 is a similar cross-sectional view, on the same scale, in a plane indicated by the dotted lines *y y* at Figs. 1 and 2. Fig. 5 is a detail partial top view of the runway, drawn on an enlarged scale to better show the novel feature of my improved construction.

In the several figures the same part will be found always designated by the same letter or figure of reference.

A is the usual ballway or playing-surface of the alley, while B is the ball return-way, composed, preferably, as shown, of two metallic tubular ways extending from a point over the pit end of the alley to the stop or newel post D and provided at the vicinity of the alley-pit with the usual trough or cage F, into which the balls picked up by the pit-boy are placed or thrown, to be returned to the terminal C of the runway at the players' end of the alley, as illustrated by the series of balls shown at Fig. 1.

The tubular ways comprising the runway B are arranged a suitable distance apart and parallel with each other in about the usual manner, except that for a short distance in front of the terminal portion C of the runway these ways are spread apart, so as to create a wider or enlarged space between them, as seen at Fig. 2, such enlarged space extending from about the point *a* to the point *b*, as seen in said figure and as indicated by the letters *a* and *b* at Fig. 1.

The ways of the runway B are preferably supported, as shown, by metallic standards E, which, projecting upwardly from the floor on which the bed A of the alley is laid, are formed each one with an upper forked portion or with arms *e*, in the upper ends of which latter are located and securely fastened the tubular ways of the runway, all as clearly shown. (See particularly Fig. 3 of the drawings.)

In operation the balls, which are placed in the usual manner in the cage F, roll down the suddenly-inclined portion of the runway B, as indicated by the dotted circles and arrows at Fig. 1, and, rapidly descending this oblique portion of the runway, pass quickly onto the nearly-horizontal or very slightly inclined continuation of said runway, going at considerable speed until they reach the point *a*, at which the ways are spread apart or diverge from each other, at which point the balls will of course each settle down farther in between said ways, and rolling thence along during the spread-apart portion will of course have their bodily movements checked by reason of rolling in contact with the ways of the runway at points higher up on the spherical surfaces of the balls, or, in other words, at points much nearer to the poles of the horizontal diameter or imaginary axis about which each ball revolves as it travels along, and when the balls arrive at the vicinity of the contraction of the ways of the runway at about the points 3 3 (see Fig. 5) in order to change its elevation relatively to the level

of the runway each ball will practically be lifted somewhat as it revolves, and this raising or elevation of the ball as it travels onto the contracted portion or terminal part C of the runway will further check the forward travel of the ball, so that it will pass onto said terminal at a comparatively low rate of speed, and hence will be moving so slowly when it may strike the balls already assembled on the terminal or shall strike against the stop-post D, if it be the first ball to descend onto said terminal, as not to induce any serious shock or concussion, and it will be understood that this structural feature of the contraction of the ways (which may be varied in form and degree as may be desirable) is an important feature of my improved return-way, since by it alone the home-coming ball may have its speed materally checked.

By reference to Figs. 3 and 4, which sectional views show, respectively, the relationship of a ball of a given diameter (say about six inches) to the ways of the runway as they are arranged during the greater portion of the extent of the latter and also the relationship of said ball to said ways as they are arranged at the vicinity of the spread-apart portion of the ways, it will be seen that the ball (shown in dotted lines at Figs. 3 and 4) will roll in contact with the ways of the runway at points much higher up on the sphere when the ball is traveling on the widened portion of the runway than when it is traveling either on that portion of the runway which extends from the pit end to the widened portion or that portion which constitutes the terminal on which the balls come to rest for use.

As shown at Fig. 5, the divergence of the ways or rods of the runway B is a little more gradual from the points 1 1 to the points 2 2 (from which latter they extend a short distance in about parallel lines) than is the convergence of these rods at the vicinities 3 3, where they more suddenly approach each other, and this sudden convergence, it will be understood, is desirable, as it will more effectually check the already reduced forward bodily movement and the revolution on its axis of the ball, which has been partially slowed down gradually by passing into and along in the enlarged space or widened portion of the runway.

It will be understood that inasmuch as many of the proportions and precise relationships of the parts shown and described may be varied at pleasure or in the judgment of the builder and user of the alley—such, for instance, as the relative elevations of the pit end of the runway and the terminal of the runway for the purpose of causing a ball put in the cage F to run to the players' end of the alley or to the vicinity of the speed-checking device in a shorter or a longer space of time, as may be desired, and such as the entire length of the terminal portion C of the runway to form the receptacle for a greater or a less number of balls, and such as the space or aperture between the ways of the runway B to adapt the runway to the use of a set of balls of a greater or less maximum and minimum diameter than involved in the series I have shown—the length as well as the width and the peculiar or precise conformation of the enlargement I have shown of the space between the ways of the runway may necessarily have to be varied more or less, according to circumstances, such variations having to be decided upon by the experienced builder of bowling-alley runways in building or putting up the runway to meet all the conditions contemplated in the use of the same.

Of course in the case of a bowling-alley in which it may be desired sometimes to use small balls a supplemental terminal or receptacle may be arranged in the usual manner beneath the main terminal and runway which I have shown and described and in such manner that the small balls after having reached the spread-apart or widened-out portion of the runway will fall or pass downwardly through said widened portion and descend onto the supplemental terminal substantially after the fashion now practiced in the construction of runways adapted for the separation of the small balls from the large ones and the collection of the latter on a terminal arranged beneath that on which the large balls rest.

Having now so fully described my novel construction of ball return-way that those skilled in the art can make and use runways involving the novel principle of construction I have shown and described carried into effect either in the precise form or forms which I have illustrated or under some modifications thereof, what I claim, broadly, as new, and desire to secure by Letters Patent, is—

1. A ball return-way, for bowling-alleys, the ways of which are, for some distance, spread apart, or more widely separated, at a locality immediately in advance of the terminal of the return-way and which converge or come nearer together again as they approach the terminal; and which operate by said spread-apart portion and convergence to check the speed of a ball and cause it to be landed on the said terminal at a comparatively low rate of speed; substantially as and for the purpose hereinbefore set forth.

2. In a ball return-way, a contraction, or convergence, of the ways, on which the ball travels toward the terminal; which contraction, by causing the ball to be raised, bodily, as it rolls over the same, checks the speed of the rolling ball; prior to its passage onto the terminal of the return-way; substantially as hereinbefore set forth.

3. In a ball return-way, ways which extend, about as usual, parallel with each other from the pit end of the alley toward the terminal

end of the runway, and which diverge, or are gradually spread wider apart, as they approach the players' end and at a suitable point in advance of the runway-terminal; said divergence, or spread-apart portion, of the ways operating to reduce the speed of the home-coming balls; substantially as set forth.

In witness whereof I have hereunto set my hand this 11th day of April, 1898.

J. N. McINTIRE.

In presence of—
M. A. O'BRIEN,
S. C. OLSEN.