

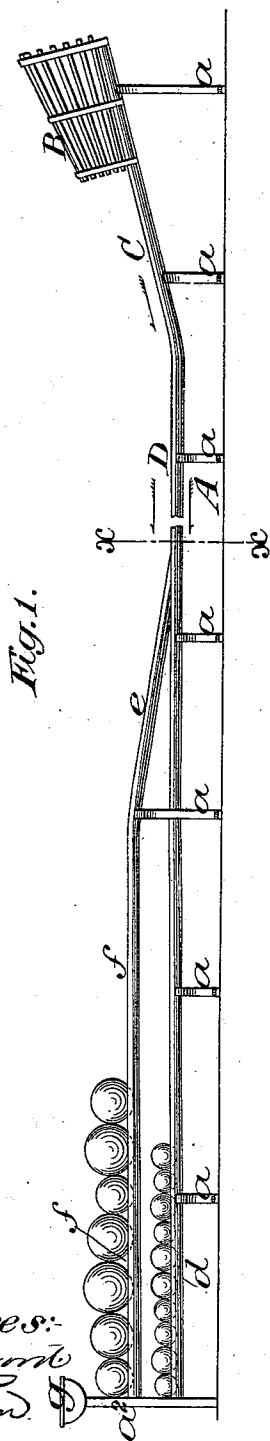
(No Model.)

W. H. WIGGINS.

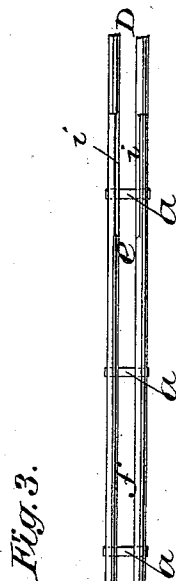
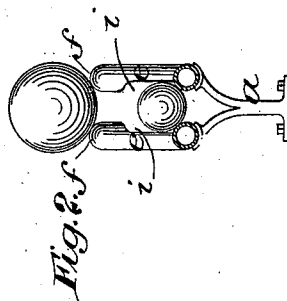
BALL RUNWAY FOR BOWLING ALLEYS.

No. 554,611.

Patented Feb. 11, 1896.



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BALL-RUNWAY FOR BOWLING-ALLEYS.

SPECIFICATION forming part of Letters Patent No. 554,611, dated February 11, 1896.

Application filed August 31, 1895. Serial No. 561,088. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. WIGGINS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Ball-Runways for 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 what is usually denominated the "ball-runway" of a bowling-alley, which is the device by which the balls that are rolled down the alley in playing the game and that are picked out of the pit by the boy who sets up the pins are conducted back to the playing end of the alley for reuse by the players.

Previous to my invention the ball-runway most commonly used has been one having a gradual descent from the pit end to the playing end of the alley and usually arranged between the pair of alleys, and in this kind of runway the balls acquire such an impetus that they land against the stop-post at the playing end of the alley (and against each other) with so much force that the balls are soon injured by battering against the post and each other. Besides, there is great danger of players getting their fingers crushed when picking out a ball at the end of the runway while another may run down, unnoticed, against those from which the selection is being made. To overcome these objections to the old-fashioned runways the latter have sometimes been provided with some sort of automatic brake, operating to partially stop or to impede the progress of the ball just before reaching the terminal end of the runway, and patents have been granted, I believe, for such devices. A comparatively late improvement, however, which has been used with very satisfactory results consists in a construction of ball-runway with a descending portion at the pit end of the alley translated into a long and low horizontal portion and with an ascending section at or near the playing end of the alley, the balls descending rapidly from the pit end of the runway, passing along over the horizontal portion of the track, and having their impetus almost wholly taken out of

them by ascending the upwardly-inclined section, so as to move very slowly as they roll onto the nearly horizontal terminal on which they are housed for use; but in runways of the last-mentioned type it has been customary to effectuate the necessary separation of the large and small balls in the old-fashioned way—viz., by forming an aperture in the elevated terminal, (which is a continuation of the ascending portion of the runway,) through which the small balls descend or fall into a receptacle beneath, but over which the large balls will continue their travel. The objection to this means of effectuating the separation of the small from the large balls, so that the latter, as usual, will rest on the higher terminal portion of the runway while the former are collected on a lower section or trough immediately undersaid higher portion, is that if the ascending portion of the runway that all the balls have to climb be made so that the small balls will roll up said ascent then the larger balls will travel up the ascending section at such a speed as to run onto the terminal section with undue impetus, whereas if the obliquity of said ascent be such as to properly retard the big balls the small ones will not travel up, and hence will never reach the point at which is provided the means of escape for said little balls from the main track down onto the lower terminal or receptacle for their accumulation at the playing end of the alley. I have made an improvement on this type of runway by which this objection or defect is wholly overcome, so that while the small balls will be collected on the lower terminal the larger ones will come to rest on the higher end section of the runway and so that the degree of obliquity of the ascending section can be always such as to completely check the velocity of the big balls.

My invention consists in a runway having a descending portion on which the balls are started on their course from the pit end of the alley, a comparatively low substantially horizontal portion, and an ascending portion near the playing end of the alley ending in a nearly horizontal terminal section, on which the larger balls come slowly or quietly to rest, and in which there is a lower terminal (vertically beneath the higher one) for the recep-

tion of the smaller balls, but in which the space or aperture between the ways or rails of the ascending section (up which the larger balls travel) is so increased or enlarged at the vicinity of its junction with the lower (and main) horizontal section that the small balls, instead of traveling up the said ascending section, pass through it or pass between the lower portions of its ways and continue thence on to their final resting place, all as will be hereinafter explained and as will be most particularly pointed out in the claim of this specification.

To enable those skilled in the art to make and use ball-runways comprising my improvement, I will now proceed to more fully describe my invention, referring by letters to the accompanying drawings, which form part of this specification, and in which I have shown it carried into effect in that precise form in which I have so far successfully practiced it.

In the drawings, Figure 1 is a side elevation of a bowling-alley ball-runway but with the middle portion of the lowermost horizontal part broken out and the two end portions represented as moved toward each other in order to make the drawing on as large a scale as possible and yet have the figure come within the prescribed limits as to the sheet of paper used. Fig. 2 is a vertical section at the line *xx* of Fig. 1, looking in the direction there indicated by the arrow. Fig. 3 is a partial top view showing only that part of the runway shown in side view by the left-hand side portion of Fig. 1.

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

As shown, the runway is supported by suitable vertical posts or standards *a*, which project upwardly from the floor; and it comprises, first, an oblique or descending portion *C*, on the rearmost (and highest) part of which is a "cage" *B* of ordinary construction, into the back end of which the balls are thrown by the boy; second, a low horizontal portion *D*, which runs the greater part of the length of the alley, and which is placed so near to the floor *a* or at such an elevation as not to interfere in the least with a full view of the ballway and pins of one alley by a player standing on the next alley; third, an ascending portion *e*, that, however, conducts upwardly only the larger balls; fourth, an approximately horizontal terminal *f* for the larger balls, and, fifth, another terminal *d* for the smaller balls, that is practically a continuation of the horizontal portion *D* of the runway.

That one of the supporting-standards *a*² that is located at the terminal end of the runway may be provided, as at *g*, with the usual sponge-cup, and the ascending portion or section *e*, it will be observed, has the space between its bars (or the two ways that constitute the ball-conductor) increased, so that all

balls of a certain diameter can, in rolling along on the section *D*, pass freely between said ways and continue their course on the section *d*, which, as I have said, is simply a continuation of *D*.

At Fig. 1 I have shown resting on the upper terminal *f* of the runway a series of the large balls, which, to reach their destination, have to roll up the ascending section *e*, while on the terminal *d* I have illustrated a number of the small balls, that, after their descent over the section *C* and their passage along over the horizontal portion *D* of the runway, continue their journey on the section *d*, passing along between the bars of the section *e*.

Preferably both of the terminal sections *d* and *f* are a little out of level, being lowest at the points where they are secured to the terminal post *a*², in order that the balls, after having reached the ends of their journeys, will with certainty remain at rest.

In view of the foregoing description of the construction and what is made plain by the accompanying drawings, little need be said in explanation of the operation of the runway shown.

When the balls collected, as usual, from the pit are thrown into the rear larger end of the cage *B*, they descend rapidly, by gravity, the downwardly-inclined portion *C* of the runway, and in rolling down this section of the conducting-ways the larger ones acquire a sufficient velocity or impetus to cause them to roll over the whole length of the horizontal part *D* and travel thence up the ascending section *e*. The smaller balls, however, by reason of the ways at *e* being cut out, as shown at *i*, (see Figs. 2 and 3,) so that the space between them is greater than that between any other portion of the ways forming the runway, do not ascend this section but remain on the extension or terminal section *d* of the horizontal track *D*.

As in practice the balls of the smaller series usually range in diameter from four and a half down to four inches in diameter, (while the larger ones run from about eight and six-tenths down to seven inches in diameter,) the space between the inner sides of the ways of the section *e* should be a little over four and a half inches, (at the cut-out *i*,) so that the four-and-a-half-inch balls will easily pass between said ways in rolling from *D* onto the terminal section *d*.

Preferably the ways are composed (see Figs. 2 and 3) of metallic tubing about two inches in external diameter, arranged so as to leave a space about three inches in the clear between them, and at the cut-out *i* the inner sides or portions of the tubes are cut away so as to increase this space to four and one-half inches full. With this preferable form of ways I use metallic supporting-stands, about such as shown at *a*; but the details of construction as to the forms and character of the ways and supports are immaterial to my invention, with reference to which it is only

necessary that the runways possess the structural feature of the widened space *i* of the ascending section *e* to permit the smaller balls to continue on their journey from *D* to the terminal section *d*.

In actual practice, so far, I found that with the ordinary sizes of balls, which vary in their diameters from eight and six-tenths down to seven inches for the larger series and from four and a half down to four inches for the smaller series, my improved runway works satisfactorily when made in about the following proportions, viz: With the ways composed of two-inch tubing set to leave a clear space of three inches between them, with the pit end at an elevation of about two feet, the long horizontal part about eight or nine inches high, the terminal section elevated to about sixteen inches, and with the descending and ascending sections *C* and *e* about four and a half and about four feet long, respectively; but the exact proportions which may give the best possible results will vary of course according to the surrounding circumstances and must be determined in view thereof by the builder of the alley, and while it is preferable, of course, to have the horizontal part *D* of the runway at quite a low level, as shown, so that the players have a free view of the ballways (when a runway is located, as is usual, between two ballways) it is not indispensably necessary to my invention that the section *D* be placed low down so long as the proper relationship of the three parts *C*, *D*, and *e* be maintained and the ascending section *e* be made, as herein shown and described, so that the balls of the smaller series will pass through said section, as explained.

As is well understood, in all ball-runways composed of parallel ways, with an intervening space, the small balls never reach the playing end of the alley with any such impetus or velocity as that acquired by the larger ones, because said small ones set down in between the ways so far that the ways contact with the spheres at points so near the poles of their axes of rotation that the balls do not roll on the ways so easily as the larger balls do; and, besides, the smaller balls being so much lighter than the others the momentum with which they would contact with the stop-post and with each other would not be very injurious even if they could acquire a greater velocity than they usually do.

In any case in which (on account of the shortness of the runway or for any other cause) there might be an undue velocity ac-

quired by the smaller balls they may be checked up, or their final movement on to the terminal track *d* sufficiently retarded, by having the lowermost part of the cut-out *i* located at a point slightly above the top or riding surfaces of the ways of section *D*, so that the balls would climb a slight distance up the section *e* before passing through it onto *d*. This modification will, however, rarely be of any practical benefit, especially as the small balls are nowadays used very seldom during the game.

My invention should not be confounded with either the old-fashioned runway having a gradual descent from the pit end to the playing end of the alley and formed with an aperture (near the playing end) for the separation of the balls, the small ones dropping through said aperture onto a supplementary track located beneath the main track, or the later improved construction I have heretofore mentioned, in which the balls are separated by means of a similar opening at the discharge end of the return-track, through which the small balls descend in like manner onto the lower supplementary track beneath; and of course I do not claim as of my invention any such construction as a means of separating the smaller from the larger balls and leaving the latter on a lower and the former on a higher track at the playing end of the alley; but

What I broadly claim as of my invention, and desire to secure by Letters Patent, is—

In that type of ball-runway comprising a descending portion or section, at the vicinity of the pit end of the alley; an approximately horizontal section extending thence toward the playing end of the alley; and an ascending section terminating in the usual elevated terminal, or rest, for the larger balls; the combination with said parts, of an extension of the main horizontal portion of the runway immediately beneath the said usual elevated terminal; and a cut-out (or cut-away) in the said ascending section, operating to permit the smaller balls to pass through said ascending section, and continue their travel on the said extension; substantially as hereinbefore set forth.

In witness whereof I have hereunto set my hand this 20th day of August, 1895.

WM. H. WIGGINS.

In presence of—

EDWARD F. BOYER,
ERNEST J. TAROF.