

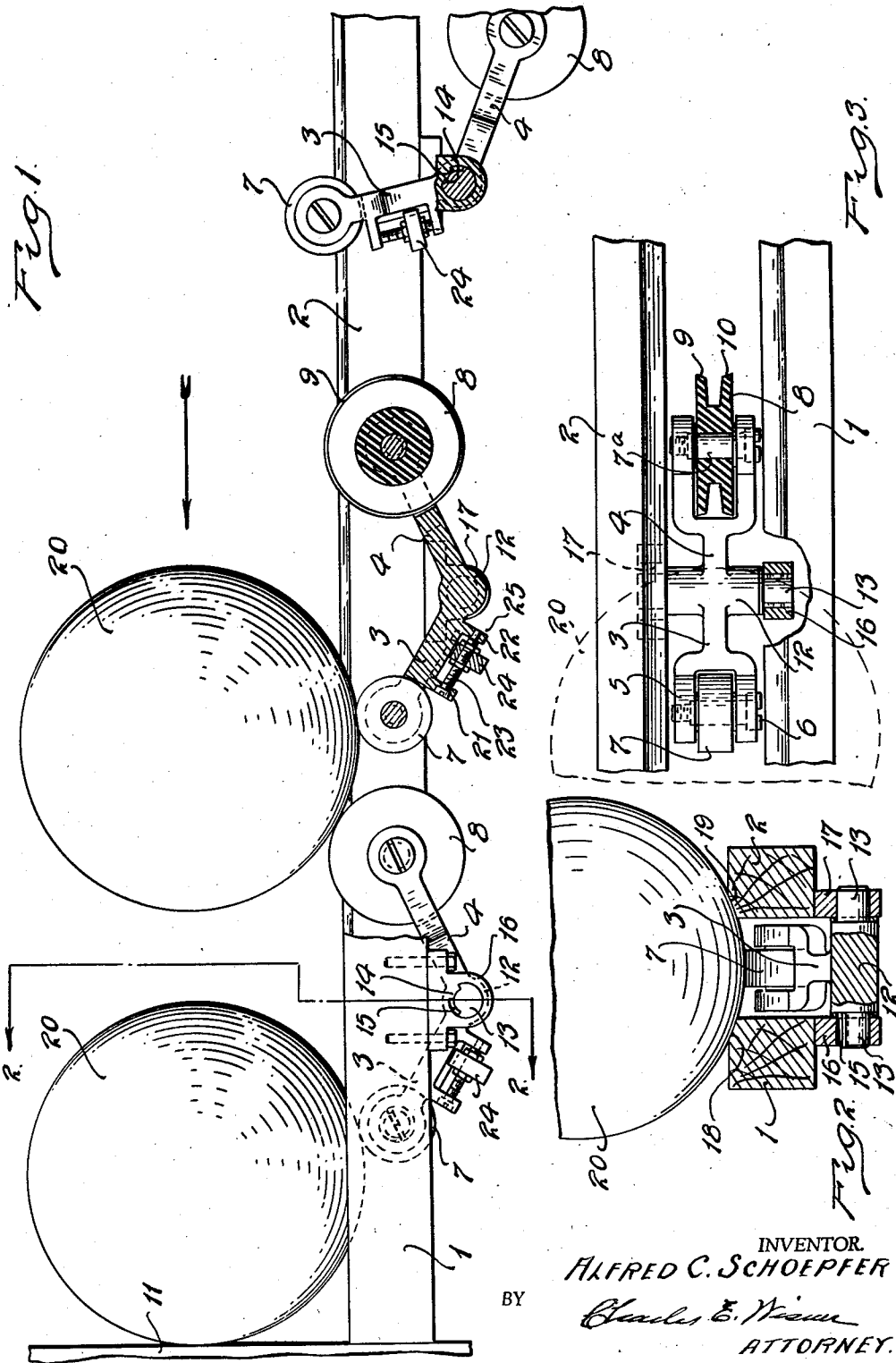
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BOWLING BALL RUNWAY

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BOWLING BALL RUNWAY

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5 Claims. (Cl. 273—47)

This invention relates to bowling ball runways for use in bowling alleys and the object of the invention is to provide a bowling ball runway at the player's end having means associated therewith for holding the balls in a spaced relationship and providing a free and unobstructed space between adjacent balls whereby the player is free to pick a ball from the group without possibility of injury to the hand due to a returning ball striking the forward ball of the series on the runway.

The invention further involves the provision of a series of devices spaced along the runway each brought to a position by a ball to place an obstruction in the path of a succeeding ball rolling into the player's end of the runway.

The usual bowling ball runway is provided with a retarding means at the entrance to the player's end of the runway of a character to restrict the speed of the ball as it enters the player's end thereof and my improved bowling ball runway may incorporate such an element although the invention is not confined to use with a primary retarding means.

A particular object and feature of the invention is to provide a pivoted lever of bell crank form, one end of which is provided with a flat faced rubber roller toward the extreme end of the runway and a larger roller on the other arm having a comparatively large diameter roller of rubber formed with spaced peripheral flanges. The ball first coming onto the runway rides onto the small flat faced roller and tilts the lever to project the large roller upwardly into the runway to provide a resilient stop against which a succeeding ball is brought to rest without particular jar due to the rubber flanges and which provide a means increasingly resistant to movement of the ball to stop movement thereof without sudden jar.

These and other various objects and features of the invention are hereinafter more fully described and claimed and the preferred form of construction of a bowling ball runway at the player's end is shown in the accompanying drawing in which—

Fig. 1 is an elevation partly in section showing the runway and the means provided for holding the balls separated.

Fig. 2 is a section taken on line 2—2 of Fig. 1.

Fig. 3 is a plan view showing my improved bowling ball separator and the flanged roller element having the function of providing a stop for a ball coming onto the runway subsequent to a previous ball being positioned therein.

In its preferred form, the invention consists in the association with the downwardly inclined spaced rails 1 and 2 at the player's stand of a pivoted lever having the arms 3 and 4. The arm 3, as will be understood more clearly from Fig. 3, has a U end portion 5, the opposite arms of which are spaced and a pin 6 passes therethrough and provides a supporting shaft for a flat faced roller 7 which is preferably rotatable thereon. The arm 4 is also bifurcated at its end and a pin 7a extends through the eyed end and provides a support for a rubber roller 8 rotatable thereon. This roller 8 is provided with a central peripheral slot in its periphery forming flexible flanges 9 and 10 which preferably are of less thickness at the periphery than at the point of engagement with the body of the roller. Thus, a ball coming into rolling contact with these flanges tends to spread the same and thus to flexibly and increasingly resist the movement of the ball.

The purpose of these flanges is to prevent too sudden stoppage of the movement of the ball which rolls by momentum or gravity on the ways 1 and 2 which are inclined from the receiving end downwardly toward the rear end of the runway which is usually provided with a stop means, as 11, shown in Fig. 1.

The arms 3 and 4 are preferably formed integral with a cylindrical hub 12. A pin 13 extends through the hub 12 and this has an arcuate slot 14 on one side thereof as shown in Fig. 1 while the hub is formed with an integral key portion 15 of less width circumferentially than the width of the slot 14. The pin 13 is supported in brackets 16 and 17 secured to the opposite rails 1 and 2. It will be noted more particularly in Fig. 2 that these rails 1 and 2 have angular faces 18 and 19 on which the balls 20 ride.

The bell crank lever 3 is preferably provided with spaced arms 21 and 22 through which a screw 23 extends and a weight 24 is apertured to receive the screw and is adjustable longitudinally of the arm by the nuts 25 thereon. The purpose of providing a weight, such as the weight 24, is to provide for proper counter-balancing the short arm 3 of the lever. The longer arm 4 is provided with considerably greater diameter roller than the short arm and while this arm and roller should be greater weight than the arm 3 and roller 7 and the counter-weight, it is desirable to adjust the weight 24 so that the arm 4 and roller 8 may turn the lever on the pivot pin 13 to the position shown at the right hand end of Fig. 1, but, as it is not desirable to present too great an obstruction to movement of a ball

20 on the runway by contact of the roller 7 therewith, the adjustable weight provides for only sufficiently less weight of the arm 3 than is provided by the arm 4 and roller to permit the latter to overbalance the arm 3, the weight and the roller 7, or vice versa as may be desired.

As previously stated, I have only shown the ball receiving end of the runway which is usually provided with a retarder at the entrance end so that balls entering the ball receiving end of the runway are prevented from moving thereinto with too great a force. The first ball of the series that are usually to be found on the runway rolls against the stop 11 and with its center slightly beyond the center of the respective roller 7 with the roller 7 in contact with the surface of the ball. The roller 7 is thus moved from the position shown in full lines at the right hand side in Fig. 1 to the position shown at the left hand end of the runway. Thus, with the ball 20 in engagement with the roller 7, the roller 8 which is of greater diameter is moved upwardly to the position shown at the left hand end of the runway and the succeeding ball as it comes to engagement therewith is stopped from further movement by the roller 8 whose flexible flanges tend to prevent the ball coming to final position with a bump.

My improved bowling ball separators are positioned along the runway in equally distant spaced relation so that each succeeding ball comes to like position in respect to the roller 7 of the companion separator device and the roller 8 being of sufficient diameter to provide such an obstruction as to prevent further movement of the ball coming to contact therewith. Thus, the balls are spaced apart as shown in Fig. 1 by my improved separator device, leaving a clear and free space for introduction of the hand of a person desiring to remove any particular ball from the runway and without fear of the hand being jammed between adjacent balls by reason of its not being possible to transfer the blow from one ball to the next of a series.

It has heretofore been known to provide an element projecting into the space between successive balls as they come onto the runway to thus keep the balls out of contact one with the other but such prior structures as are within my knowledge have the defect of placing an obstruction to introduction of the hand of the user between the ball. With my improved apparatus, the player may place the hand between the balls, if necessity so requires, to introduce the fingers into the recesses provided therefor in the ball without fear of the hand being jammed by force of a ball entering the runway at the time and my improved device only has the roller 7 normally visible when there are no balls on the runway and my improved device functions automatically by weight of one ball to position an obstruction in the path of movement of a succeeding ball at a point materially below the centerline of the ball and is thus not in position to obstruct introduction of the hand of the player between adjacent balls.

It is to be noted in Fig. 1 that the two balls shown therein are in such position that the vertical center line passing through the balls is forward of a vertical center line passing through the respective rollers 7. Thus, the second ball coming to contact with the roller 8 of the lever at the left hand end of the runway would normally tend to depress the roller 8 but such action is prevented due to the weight of the first ball on the

roller 7. Each of the balls of a series are in like position with the respective levers and rollers and each of the levers not having a ball in contact with the roller 7 thereof is turned upwardly into the path of movement of the ball entering the runway by the greater weight of the roller 8 and arm 4.

Thus, the spacing of these levers is such that a bowling ball comes to rest to the rear of the axis of the respective roller 7 and when stopped in its movement by the roller 8 of the next lever toward the left hand end of the runway.

While I have shown at the right hand side of Fig. 1 a lever having the weight 24 so adjusted that the small roller 7 is positioned in the path of a ball rolling onto the runway, the weight may be moved toward the small roller to thus cause the arm to normally occupy a position with the larger roller projecting to position to be first engaged by the ball as the apparatus works equally as well with one arrangement as with the other. In either case, when a ball 20 is positioned on the small roller 7, as shown at the left hand end of Fig. 1, the large roller 8 is firmly held by weight of the bowling ball in position to provide a stop for the succeeding ball.

It is believed obvious from the foregoing description that the various features and objects of the invention are attained by the structure described and it is further pointed out that various changes in arrangement and details of the parts may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is:

1. In a bowling ball runway having a pair of spaced rails at the player's end thereof, a series of levers pivotally supported by the runway and having end portions positionable in the space between the runways, a roller of small diameter on the end of each lever toward the end of the runway, and a roller of larger diameter on the end of the other arm of each lever providing a structure whereby a ball resting on the first named roller positions the roller at the other end of the arm in the path of a succeeding ball moving onto the runway to provide a stop therefor and maintaining an unobstructed space between the balls to facilitate the removal of any ball of the series from the runway.

2. In a bowling ball runway having a pair of spaced rails at the player's end thereof, a series of levers pivotally supported by the runway and having end portions positionable in the space between the runways, a roller of small diameter on the end of each lever toward the end of the runway, and a rubber roller of larger diameter on the end of the other arm of each lever providing a structure whereby a ball resting on the first named roller positions the rubber roller in the path of the succeeding ball to yieldably check its movement and maintaining an unobstructed space between the balls.

3. In a bowling ball runway, means at the player's end of the runway for maintaining the balls in spaced relation thereon, comprising a series of levers each pivotally supported between its ends by the runway at points spaced a distance apart practically equal to the desired spacing of the balls thereon, the end of the lever toward the rear end of the runway being less in length than the other end of the lever whereby

a ball coming to rest on the first named end of the runway positions the other end of the lever in the path of a succeeding ball, and a flexible roller providing a cushioning means at the last named end of the lever to reduce the shock of impact of a ball engaging the same.

4. In a bowling ball runway, ball actuated means for maintaining the balls separated at the player's end of the runway, comprising a lever pivotally supported between its ends by the runway, a roller at each end of the lever, the roller at the end of the lever toward the rear end of the runway being engaged by a ball to turn the lever on its axis and so position the roller on the other arm of the lever as to provide an obstruction to movement of a succeeding ball therebeyond, and thus space the balls on the runway.

5. In a bowling ball runway, a series of devices for maintaining the balls at the player's end of the runway a distance apart to provide an unobstructed space therebetween, each of the devices comprising a lever pivotally supported between its ends by the runway, a roller at each end of each lever, the roller at the end of each lever toward the rear end of the runway being positioned to be engaged by a ball and thereby position the roller at the other end of the lever to provide an obstruction to movement of a succeeding ball, the parts being so arranged that the rollers of each lever engage the respective balls below a line passing between the center of the balls to provide an unobstructed space therebetween.

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