Feb. 19, 1952 J. RODOCK 2,586,718

BALL RETARDER FOR BOWLING ALLEYS

Filed Oct. 15, 1948 3 Sheets-Sheet 1

Fig. 1

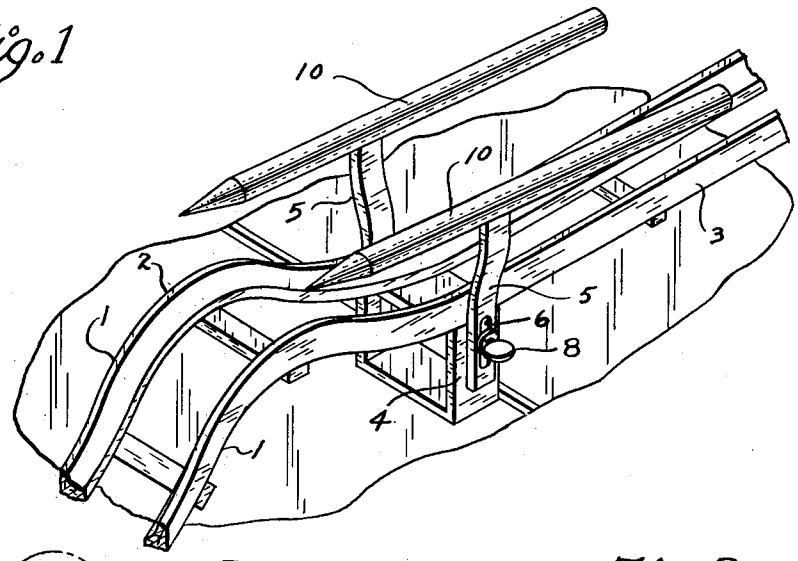
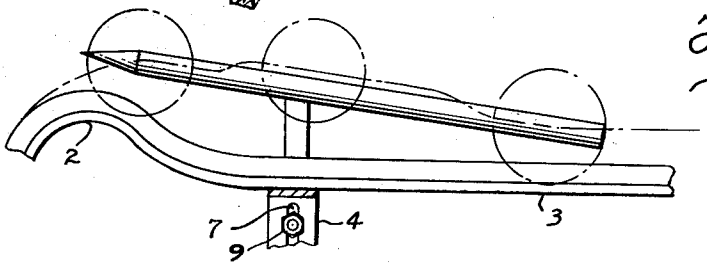


Fig. 2



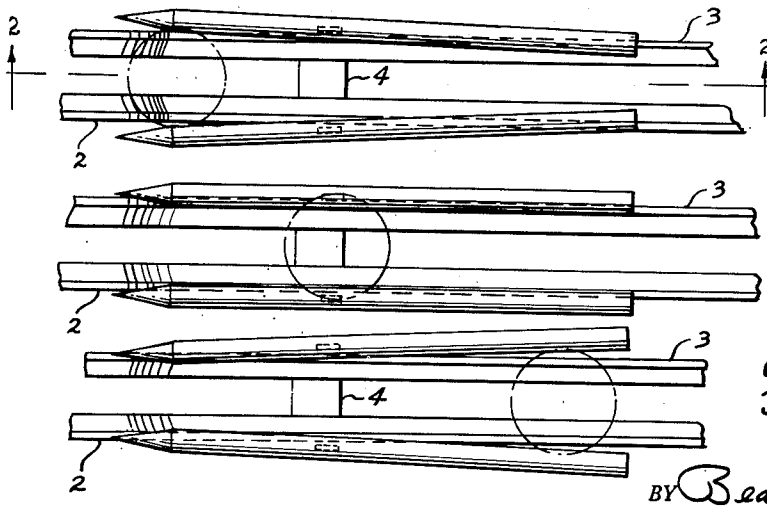


Fig. 3

Fig. 4

Fig. 5

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Fig. 6

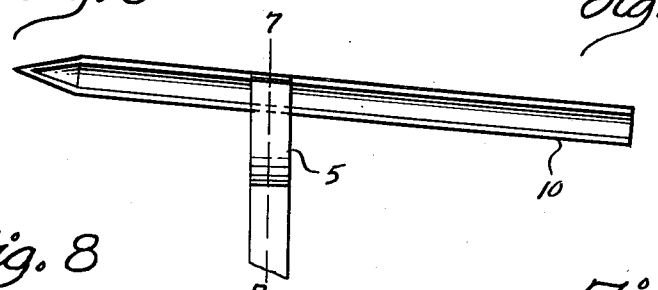


Fig. 7

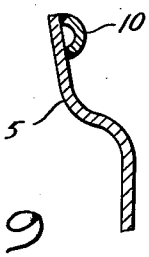


Fig. 8

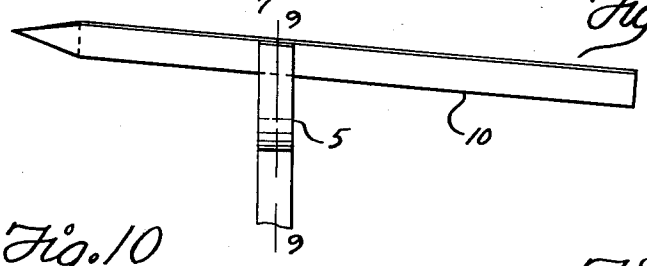


Fig. 9

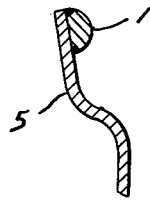


Fig. 10

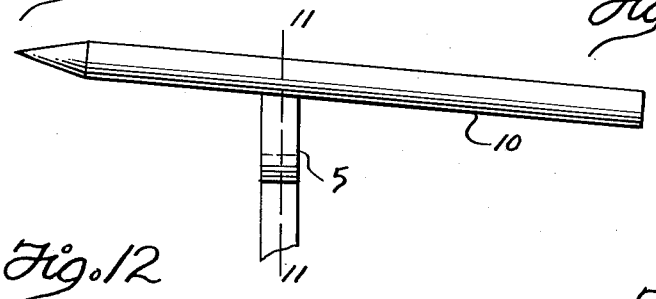


Fig. 11

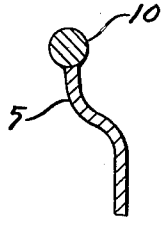


Fig. 12

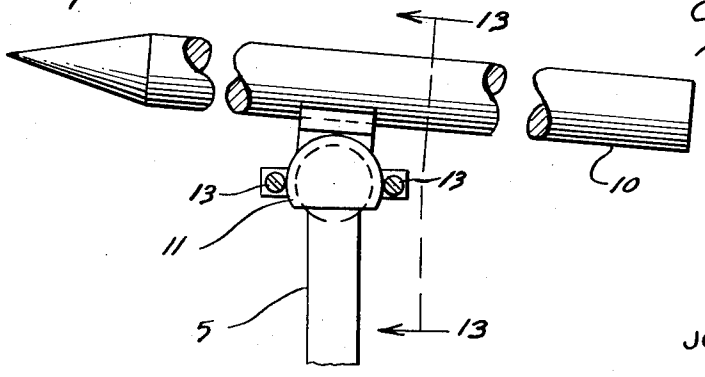
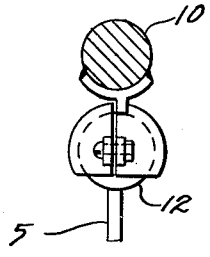


Fig. 13



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Fig. 14

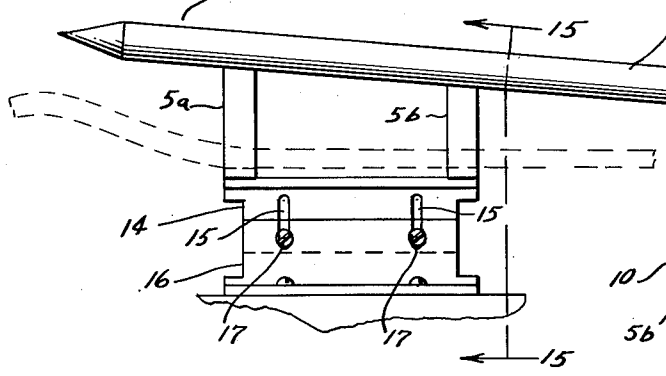


Fig. 15

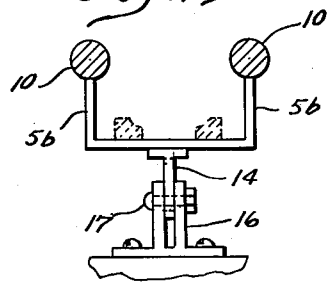


Fig. 16

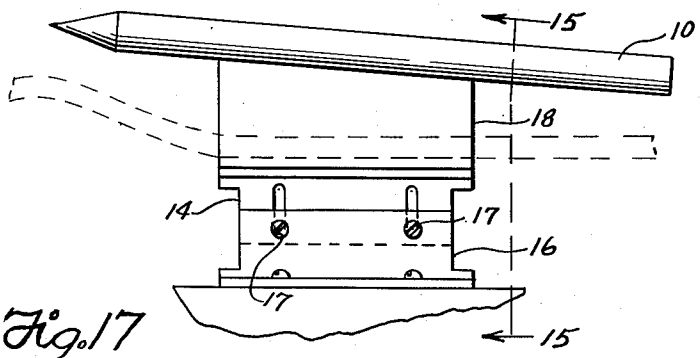


Fig. 17

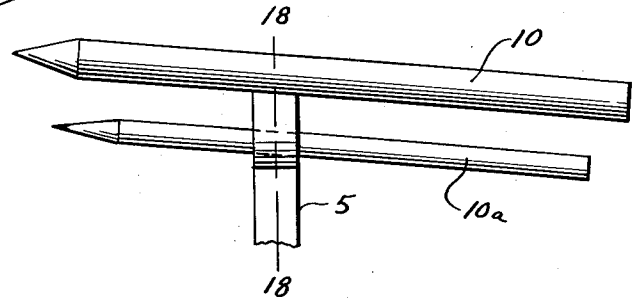
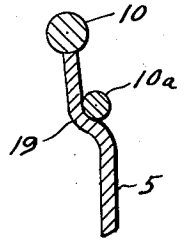


Fig. 18



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BALL RETARDER FOR BOWLING ALLEYS

John Rodock, Washington, D. C.

Application October 15, 1948, Serial No. 54,785

5 Claims. (Cl. 273—47)

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This invention relates to an accessory for use with bowling ball return runways and more particularly to devices for retarding the movement of bowling balls on return runways as they enter the receiving rack at the end of the runway.

There have been numerous attempts to provide devices for reducing the speed of bowling balls entering the receiving rack at the end of a return runway in order to prevent damage to the bowling ball and injury to the player. The devices now in use are complicated and, as a result thereof, the costs of installation and maintenance are excessive. The installation of these devices in established alleys necessitates reconstructing a large portion of the return runways and makes the cost thereof almost prohibitive.

It is an object of this invention to provide a simply constructed and inexpensive bowling ball retarding device having a minimum of moving parts.

Another object of this invention is to provide a bowling ball retarding device which may be quickly and easily installed in established alleys without requiring the alteration of the return runways.

Still another object of this invention is to provide a bowling ball retarding device which may be simply and rapidly adjusted to produce the desired braking effect on returning balls entering the receiving rack.

A further object of this invention is to provide a bowling ball retarding device comprising resilient members adjacent the ball receiving rack having elongated ball retarding members secured to the upper end of the resilient members and supporting means for the resilient members adapted to align the ball retarding members substantially parallel to the rack and spaced thereabove.

A still further object of this invention is to provide a bowling ball retarding device comprising resilient members adjacent the ball receiving rack having elongated ball retarding members secured to the upper ends of the resilient members and adjustable supporting means for the resilient members adapted to vary the effective length of the resilient members and, thus vary the flexibility of these resilient members.

Other and further important objects of the invention will be apparent from the following description and the accompanying drawings, in which:

Figure 1 is a perspective view of a section of the return runway showing the retarding device

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incorporated with the receiving rack at the end of the runway.

Figure 2 is a fragmentary, longitudinal sectional view through the ball retarding device, taken on the line 2—2 of Figure 3, with a schematic showing of the position of a bowling ball at various stages as it passes through the retarding device to the receiving rack.

Figures 3, 4 and 5 are top plan views of the ball retarding device showing the various positions of the ball retarding elements of the retarding device as the ball which is shown schematically passes therethrough to the receiving rack.

Figures 6, 8 and 10 are fragmentary side elevational views of various modifications of ball retarding members which may be employed in the retarding devices constituting this invention.

Figures 7, 9 and 11 are fragmentary sectional views through the ball retarding members shown in Figures 6, 8 and 10, respectively; and taken on the lines 7—7, 9—9, and 11—11, respectively of these figures.

Figure 12 is a fragmentary side elevational view of a modified form of attachment between a ball retarding member of the retarding device and the associated resilient member.

Figure 13 is a fragmentary sectional view taken on the line 13—13 of Figure 12.

Figure 14 is a side elevational view of a modified form of retarding device having an adjustable bracket therefor.

Figure 15 is a sectional view through the modification shown in Figure 14 and taken on line 15—15 thereof.

Figure 16 is a side elevational view of a further modification of retarding device.

Figure 17 is a fragmentary side elevational view of a modified form of ball retarding member of the retarding device adapted for use with either a standard bowling ball or a junior size ball designed for children's use.

Figure 18 is a fragmentary sectional view of the modification shown in Figure 17 and taken on the line 18—18 thereof.

Referring to the drawings in detail, a section of a bowling ball return runway is shown in Figure 1 consisting of a pair of spaced parallel side rails 1—1 which extend from the usual return trough in an upwardly inclined curve to form ball decelerating riser 2 and terminate in a receiving rack 3. The riser 2 and the receiving rack 3 are supported by a pedestal 4.

The bowling ball retarding device comprising this invention includes a pair of resilient mem-

bers 5—5 formed from resilient metal bar stock. Each resilient member 5 is provided with a longitudinal slot 6 adapted to register with a corresponding longitudinal slot 7 formed in the side of the pedestal 4. The resilient members 5—5 are supported on the associated sides of the pedestal 4 by an adjustable clamp consisting of a bolt 8 which extends through the registered slots 6 and 7 and which may be secured in the desired position by a nut 9. A ball retarding member 10 is secured to the upper end of each resilient member 5. The retarding members 10—10 are formed preferably, from metal tubes or rods and the ends thereof adjacent the riser 2 are made conical in form or otherwise provided with inclined surfaces adapted to guide a returning ball as it enters the retarding device. The guiding action is especially desirable when the returning ball wavers as it moves over the rails 1—1 into the retarding device. The inclined ends of the retarding members 10—10 may be covered with a synthetic rubber or rubber-like material to protect the player from injury and, if desired, the entire surface of each member may be coated with the same or a similar material to modify the frictional characteristics of the surface.

The resilient members 5—5 are supported in such a manner that the associated ball retarding member 10 is aligned throughout the length thereof substantially parallel to the rails of the receiving rack 3. The ball retarding members 10—10 are spaced above the rails of the runway. In the preferred embodiment of the invention the ball retarding device is installed with the leading ends of the ball retarding members 10—10 positioned immediately above the apex of the riser 2. The center of the leading end of each retarding member 10 is spaced above the bottom of the ball carrying groove in the corresponding rail a distance equal to or slightly less than the radius of the ball. The same spacing is provided between the centers of the trailing ends of the retarding members 10—10 and the bottom of a ball supporting grooves in the rails of the receiving rack 3. When the ball retarding device is positioned as described with respect to the return runway and the receiving rack, the ball retarding members 10—10 are slightly inclined. The ball retarding device may, however, be positioned over the receiving rack 3 and rearwardly of the riser 2. When the device is so positioned and the spacing above the rails of the receiving rack 3 is maintained as described, the ball retarding members 10—10 will be substantially horizontal. The distance maintained between the ball retarding members is slightly less than the diameter of the ball and this desired spacing is obtained by bending the resilient members 5—5 to provide offset portions.

The retarding action of the device is shown in Figures 2, 3, 4, and 5. The bowling ball is returned in the trough of the runway; and, as it moves over the apex of the riser 2 and approaches the retarding device, the ball tends to leave the ball carrying grooves in the rails due to the action of centrifugal force. Simultaneously the ball is guided by the inclined surfaces of the leading ends of the ball retarding members 10—10 into the retarding device. The ball engages the opposed arcuate faces of the retarding members 10—10 and spreads the latter members. It will be apparent from Figure 3 that retarding members 10—10 pivot in a horizontal plane and twist the resilient members 5—5 when the ball is engaged therebetween. The tendency of the resilient members 5—5 to return to their normal position provides a braking action by forcing the retarding members against the sides of the ball. The overspin of the ball coupled with the pressure of the retarding members 10—10 causes the ball to climb up on these members and the ball then rolls freely thereover for a short distance as shown in Figures 2 and 4. During this period the retarding members 10—10 return to their normal position of substantially parallel alignment with the rails of the runway. As the ball approaches the trailing ends of the retarding members 10—10, the weight thereof causes these members to spread. The retarding members 10—10 are then forced apart and the resilient members 5—5 are again twisted. While this action takes place, the ball descends slowly between the members 10—10 and begins to overspin. The resilient members 5—5 force the trailing portions of the retarding members 10—10 against the sides of the ball to provide a second braking action. This action continues as the ball descends; and, when the ball again rests in the grooves in the rails of the receiving rack 3, it moves slowly toward the receiving rack with the sides thereof in contact with the trailing portions of the retarding members 10—10 until it emerges slowly from the retarding device.

The retarding or braking action of the members 10—10 may be varied by controlling the degree of flexibility of the resilient members 5—5. The control of the degree of flexibility of these members is accomplished by varying their effective length. Thus, when the resilient members 5—5 have been positioned so as to align the ball retarding members 10—10 substantially parallel to the runway and properly spaced thereabove, the adjustable clamp may be tightened and the braking action of the retarding device tested. If greater resiliency is desired, the effective length of the resilient members 5—5 may be increased by lowering the adjustable clamp; and, conversely, if less resiliency is desired the effective length of the members may be decreased by raising the adjustable clamp. An adjustable clamp consisting of a bolt 8 and a nut 9 represents the preferred form of adjustable supporting means for the resilient members 5—5. It will be readily apparent, however, that numerous other expedients may be employed to vary the effective length of the resilient members 5—5 and, in turn, the degree of flexibility of these members.

The elongated ball retarding members 10—10 employed in the retarding device are, in the preferred embodiment of the invention, formed from metal tubes or a rod as shown in Figures 10 and 11. Other forms of ball retarding members may be employed such as, for example, a curved arcuate plate as disclosed in Figures 6 and 7 or a half-round bar as disclosed in Figures 8 and 9. It is only necessary that the ball retarding member employed be of such form that a pair of opposed arcuate faces be provided when the retarding members are aligned substantially parallel to the runway. These arcuate faces provide for a minimum of contacting surface between the retarding members and the ball passing through the retarding device; and, furthermore, provide a surface upon which the ball may roll freely, as described, between the braking actions accomplished as the ball passes between the leading and trailing ends of the retarding members.

The ball retarding members 10—10 are secured, intermediate the ends thereof, to the associated resilient member 5 by welding the re-

spective members. Other means for attaching these members may be employed such as, for example, through a ball and socket clamp as shown in Figures 12 and 13. In this modification, a ball socket clamp 11 is secured to the retarding member 10. A ball portion 12 formed on the end of the resilient member 5 is adapted to be received in the clamp 12 and rigidly secured therein by tightening the bolts 13.

A further modification is disclosed in Figures 14 and 15 comprising a ball retarding device which may be incorporated in a return runway without the necessity for altering the runway. In this form of the invention a pair of ball retarding members 10—10 are secured, intermediate the ends thereof, to the upper ends of two pairs of resilient members 5*a*—5*a* and 5*b*—5*b*. Each pair of resilient members comprises U-shaped metal bars having vertical portions to which the ball retarding members are secured. The bases of the U-shaped resilient members are secured to a T-plate 14 provided with vertical slots 15—15. The T-plate 14 is adjustably secured to a mounting bracket 16 which, in turn, is attached to the floor. The ball retarding members 10—10 may be elevated or lowered with respect to the rails of the receiving rack in the runway by adjusting the height of the T-plate 14 with respect to the bracket 16 and the retarding members 10—10 secured in the desired position by tightening the bolts 17—17. The U-shaped resilient members 5*a*—5*a* and 5*b*—5*b* are arranged and the retarding members 10—10 secured thereto in such a manner that the latter members will be aligned substantially parallel to the rails of the receiving rack. In lieu of the U-shaped resilient members 5*a*—5*a* and 5*b*—5*b*, a U-shaped resilient metal plate 18 may be employed for supporting the ball retarding members 10—10 as shown in Figure 16. The operation of the ball retarding devices disclosed in Figures 14 and 16 is the same as that of the retarding device disclosed in Figures 1 and 2.

In the modification disclosed in Figures 17 and 18, there is provided a ball retarding device adapted for use with either a bowling ball of standard size or a smaller ball used by children which is referred to as a junior ball. In this form of the invention, the ball retarding member 10 which is adapted for use with bowling balls of standard size is secured to the upper end of the resilient member 5. The resilient member 5 is bent to provide an offset portion 19 to which is secured a second ball retarding member 10*a*. The ball retarding member 10*a* is positioned inwardly with respect to the member 10 and is adapted to retard the movement of a smaller bowling ball on the return runway. The retarding members 10 and 10*a* are parallel and both members may be aligned substantially parallel with respect to the rails of the return runway. The lower ball retarding member 10*a* operates to retard the movement of a small bowling ball in the same manner as the retarding member 10 retards the movement of a bowling ball of standard size. The presence of the retarding member 10*a* on the resilient member 5 does not interfere with the retarding operation of the member 10 on a bowling ball of standard size.

I claim:

1. An accessory for use with a bowling ball return runway comprising a pair of spaced upwardly extending resilient supports, each support being formed from resilient material and being shaped to permit the support to twist about an upwardly extending axis, an elongated ball retarding member rigidly secured adjacent the middle portion thereof to the upper end of each support, to provide pairs of leading and trailing ball retarding end portions on each member, means for securing said supports in a manner to align the associated retarding members in a horizontal plane approximately parallel to the top of a bowling ball return runway and spaced thereabove, and permit a passing ball first to engage both leading end portions and move the same laterally, and, thereafter, engage both trailing end portions and move the same laterally, the movement of said portions being permitted by a twisting and lateral tilt of each resilient support and its associated retarding member as a unit with reference to said upwardly extending axis.

2. An accessory for use with a bowling ball return runway comprising a pair of spaced vertically extending resilient supports, each support being formed as a leaf spring to permit the support to twist about a vertical axis, an elongated ball retarding member rigidly secured adjacent the middle portion thereof to the upper end of each support, approximately at a right angle thereto, to provide pairs of leading and trailing ball retarding end portions on each member, means for securing said supports in a manner to align the associated retarding members approximately parallel to a bowling ball return runway and spaced thereabove, and permit a passing ball first to engage both leading end portions and move the same laterally; and, thereafter, engage both trailing end portions and move the same laterally, the movement of said portions being permitted by a twisting and lateral tilt of each resilient support and its associated retarding member as a unit with reference to a vertical axis.

3. An accessory as set forth in claim 1 wherein each resilient support securing means comprises a slidable adjustable clamping means for securing a respective support to a bowling ball return runway to permit variation of the effective length of the support, whereby the resiliency of each support may be varied and the resistance thereof to twisting and lateral tilt with reference to said upwardly extending axis varied.

4. An accessory as set forth in claim 1 wherein the pairs of resilient supports are adjustably secured to a single mounting bracket, whereby the position of the retarding members may be varied with respect to the associated ball return runway.

5. An accessory as set forth in claim 1 wherein each resilient support is bent to provide an offset portion, a second elongated ball retarding member secured approximately at the middle portion thereof to the offset portion in a position below the first named ball retarding member to provide a pair of ball retarding members positioned inwardly of the pair of first named ball retarding members.

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