

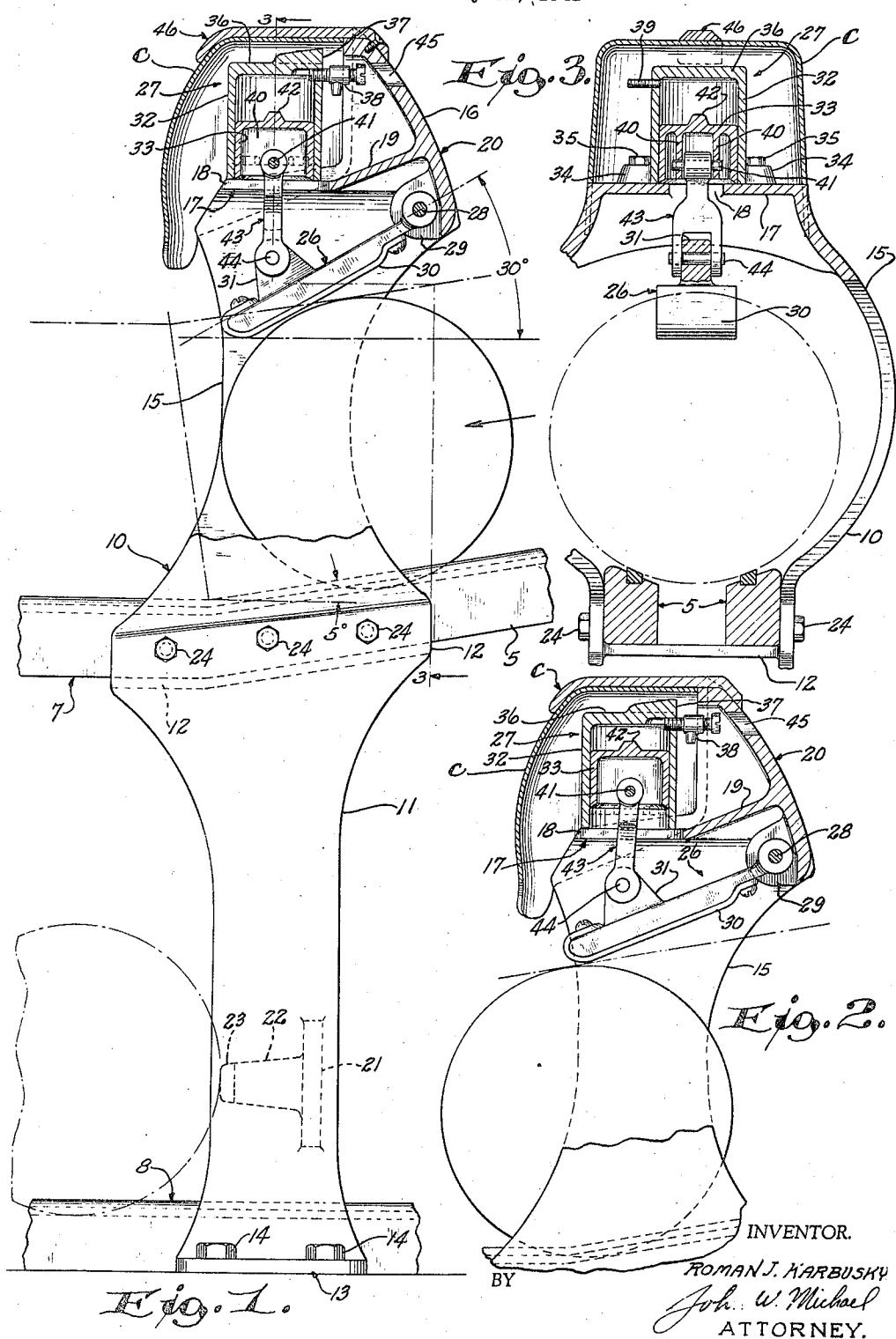
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BOWLING BALL RETARDER

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BOWLING BALL RETARDER

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2 Claims. (Cl. 273-47)

This invention relates to a bowling ball retarder for use in controlling the speed of bowling balls as they travel onto the pick-up rack at the bowlers' end of the bowling alley.

This application is a continuation in part of the application of Roman J. Karbusky, Ser. No. 329,241, filed April 12, 1940, for "Bowling ball retarders."

An object of the invention is to provide a bowling ball retarder which will momentarily and completely stop the ball as it comes into the retarder from the return and then permit it to roll gently onto the pick-up rack.

Another object of the invention is to provide a bowling ball retarder which regulates the speed at which the ball will travel onto the pick-up rack and yet retain the ball in the retarder for a minimum length of time, thereby avoiding the possibility of the ball being struck by a succeeding ball coming down the return.

Another object of the present invention is to provide a bowling ball retarder of this character, which is simple, compact, and closely organized in its construction, attractive and ornamental in appearance, reliable and effective in operation, and easy and comparatively inexpensive to manufacture and install.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, in which:

Figure 1 is a view partly in side elevation and partly in cross section (the cross section line meandering from the central axis in places for the purpose of illustration) of a bowling ball retarder embodying the present invention and showing the parts in the reposed position prior to being engaged by a bowling ball;

Figure 2 is a fragmentary view in cross section (the section line meandering as in Figure 1) of a bowling ball retarder embodying the invention, with the parts shown in the position caused by the passage of the ball through the retarder at the time the ball leaves the retarder; and

Figure 3 is a view in cross section taken on the line 3-3 of Figure 1.

Referring in greater detail to the drawing, the numeral 5 designates the section of the return which slopes downwardly from the top of the riser portion of the return to the pick-up rack 7.

The section 5 is inclined upwardly from the rack 7 approximately five degrees. This incline has been found to be sufficient to impart to the ball (through the effect of gravity) enough force to cause the ball to proceed from a dead stop in the retarder out onto the rack 7 at a gentle speed which will avoid possible injury to balls or to users. It is to be understood that when the balls are returned they roll up a riser (not shown) which greatly reduces their speed, and thence to the section 5. A dead storage rack 8 may be employed below the pick-up rack 7. It is to be understood that the words "return" and "rack" refer to the usual parallel rails known to those skilled in the art. These rails are spaced a sufficient distance to securely guide the ball. The rails may be faced with composition inserts which tend to provide a smoother runway and deaden the sound.

The retarder, which is positioned between the riser and the pick-up rack 7, comprises a frame-like casting, designated generally at 10. The casting has a pair of standards or uprights 11. The uprights 11 are disposed on opposite sides of the section 5 and pick-up rack 7. Approximately midway between the top and bottom of the uprights they are joined by a supporting web 12 integrally formed therewith. Each upright member 11 is provided at its lower end with an out-turned flange or foot 13 by which the retarder may be securely fastened to the floor by lag screws or other fastening means 14. Above the web 12 each upright has outwardly bowed sections 15 to afford the clearance necessary for the bowling ball to pass between the uprights when rolling section 5 onto pick-up rack 7. The uprights 11 are joined together by a top piece, designated generally as 16. The top piece 16 comprises a flat horizontal portion 17, a curved wall portion 18, and an upwardly inclined portion 19 which joins the flat portion 17 to the curved wall portion 20. All of these portions extend between and are integral with the uprights 11. The flat portion 17 is provided with centrally located slot 18 to accommodate the dashpot mechanism as hereinafter described. A cross member 21 having a lateral projection 22 extends between the upright members 11 at their lower ends. This serves to strengthen the casting and provides a support for a rubber block 23 which may be positioned on the end of projection 22 to provide an abutment for balls resting on the storage rack 8.

In order to aid in maintaining an angle of approximately five degrees between the horizontal pick-up rack 7 and the downwardly sloping sec-

tion of the return 5, the web 12 is cast so that a large portion thereof is inclined at approximately five degrees to the horizontal. The rails comprising the section 5 may be bolted or otherwise secured on the web 12 by means of lag screws 24 passing through the uprights 11. The rails comprising the pick-up rack 7 may likewise be secured to the horizontal portion of the web 12.

The control of the speed of the ball as it passes onto the rack 7 is accomplished by first momentarily and completely stopping the ball and then permitting it to proceed under the force of gravity down the five degree incline onto the rack 7. To effectuate the momentary complete stop, there is provided a brake or shoe, designated generally at 26, and an associated dashpot, designated generally at 27. The brake shoe has an enlarged portion at one end which is provided with an aperture accommodating a pivot 28. The pivot 28 is supported in bearings 29 formed integrally with the uprights 11 and the wall portion 20. The bearings 29 are positioned just below the upwardly inclined end of portion 19 and are spaced from each other to receive therebetween the enlarged pivot end of the shoe 26. The bearings 29 are apertured to receive the pivot 28. The pivot may be in the form of a bolt provided with a head and secured in place by a nut. However, it is to be understood that it may be held in place within the bearings 29 by set screws or other fastening means. The shoe 26 beyond the enlarged pivoted end has a thickened portion extending substantially the length thereof. To the underside of this thickened portion there is secured a leather cushioning pad 30. The pad 30 is adapted to engage with the surface of the ball without injuring it. Between the leather and the shoe 26 there may be inserted a layer of sponge rubber (not shown) to absorb some of the shock resulting from engagement between the shoe and the ball. One end of the leather pad 30 is secured to the shoe between the enlarged apertured portion and the thickened portion by means of screws or other fastening devices. The other end of the leather pad 30 is carried around the free end of the shoe 26 and is secured to the top thereof by means of screws or other fastening devices. The lower surface of the shoe may be slightly concaved to more closely conform the shape of the pad 30 to the surface of a standard ball. This insures a larger engaging surface between the ball and the leather. On top of the shoe 26 there is provided an upwardly projecting fin 31 which has an aperture therethrough. This fin forms a bearing for a connecting rod.

The dashpot 27 comprises a cylinder 32 and a piston 33. The lower end of the cylinder is open and is provided with integrally formed, laterally projecting feet 34 which are apertured to receive bolts 35. The cylinder 32 fits flushly on the flat horizontal portion 17, with its open end facing downwardly. The bolts 35 are screwed into the flat horizontal portion 17 to hold the cylinder in place. The cylinder straddles in part the slot 18 formed in the flat horizontal portion 17. The upper end of the cylinder 32 is formed with an integral head 36. A fillet 37 is formed on the head to accommodate a bore to receive the threaded end of the regulating valve 38. A screw adjustment is provided in the end of this valve to regulate the orifice in the valve to provide for controlled restricted escape of air from the interior of the cylinder to the atmosphere. An aperture 45 is provided in the wall portion 20 to provide access from the outside of the top piece to

the adjusting screw of the regulating valve 38. The cylinder wall, at a point adjacent the head 36 and ninety degrees from the regulating valve 38, is drilled and tapped to receive the valve stem and valve comprising the check valve 39. This valve may be identical with the type of valve stem and valve customarily used with bicycle tires and the like.

The piston 33 is a hollow cylindrical member. Depending from its head and within the walls or skirt are spaced webs 40 which are apertured to receive a wrist pin 41. At its lower end the piston is open. Located centrally on the top surface of the head of the piston is a small, conical-shaped abutment 42. This abutment is designed to engage with the top of the cylinder 32 to prevent the piston from engaging or interfering with the stem of the check valve 39 which would prevent the proper operation of the dashpot. The lower edges of the piston rest on the upper surface of the flat horizontal portion 17 to determine the bottom travel of the piston 33 in the cylinder 32, or its normal at rest position illustrated in Figure 1.

A connecting rod 43 has one end fitted in between the webs 40 of the piston 33. This end is apertured to receive the wrist pin 41. The other end of the connecting rod is jaw-shaped. The jaws are apertured to receive a pin 44 which connects the connecting rod 43 to the fin 31 of the shoe 26. The connecting rod 43 operates within the confines of the slot 18 provided in the flat horizontal portion 17 of the top piece 16.

A cover member C fits on the top piece 16 and covers the dashpot 27. A strap 46, extending over the cover member and projecting over the curved wall portion 20, may be screwed to the wall portion to hold the cover C in position.

It has been found that if the shoe 26, when in its at rest position, as shown in Figure 1, has an angle of inclination of approximately thirty degrees to the horizontal, an effective transfer of force between the ball and the shoe will take place upon engagement therebetween. For most advantageous results the pivot 28 of the shoe 26 should be positioned substantially close to the top of the path of travel of the ball as it passes thereunder. It is also desirable to have the ball engage the shoe at a point which is removed from the pivot 28 approximately the same distance as is the axis of the pin 44. In addition, the length of the shoe 26 from the point of first contact with the ball to the end thereof must be enough so that with the pivot 28, and the pivot 44 positioned as described, the shoe 26 will pivot as the ball passes thereunder an amount sufficient to move the piston 33 substantially in excess of fifty per cent of its permissible upward travel within the cylinder 32. With this relationship of the parts, the ball upon striking the shoe 26 causes a rapidly increasing compression in the dashpot 27 which will be enough to momentarily and completely stop the ball shortly after it engages with the shoe. Thereafter gravity acting upon the ball as it rests upon the downwardly inclined section 5 will cause it to start to move and renew the upward swinging of the shoe 26 until it is released from thereunder, as shown in the position of parts illustrated in Figure 2.

The speed at which the ball passes through the retarder depends upon the adjustment of the regulating valve 38. This valve is regulated so that the momentarily complete stop occurs when the ball has traveled about close to one-half of its total travel in contact with the shoe. The

amount of time consumed by the ball in passing through the retarder after it has been completely stopped is lessened as the regulating valve is opened. In any event, the speed of the ball as it leaves the retarder in every instance is bound to be slow enough to prevent injury to the ball and user.

As soon as the ball passes from under the shoe 26, as illustrated in Figure 2, the shoe 26 rapidly returns to its operative position, as shown in Figure 1. The check valve 39 permits air to enter into the cylinder 32, preventing any rarefaction above the piston and permitting the piston to freely and rapidly move downwardly in the cylinder.

Although there is shown and described a certain specific embodiment of the invention, many modifications thereof are possible. The invention is not to be restricted except in so far as is necessitated by the prior art and by the spirit of the appended claims.

I claim:

1. In a ball retarder a brake shoe, means for pivotally mounting said shoe above an inclined runway with one end thereof disposed in the path of balls rolling along said runway, a pneumatic dashpot including a piston, means for mounting said dashpot above said shoe, means connecting said piston to said shoe at substantially the point of contact thereof with a ball on said runway, and adjustable means for controlling the egress of air

from said dashpot when said shoe is struck by a ball, said control means being adjusted in relation to the capacity of said dashpot, the throw of said shoe, and the normal speed of a ball on said runway to completely but momentarily stop a ball before the shoe moves sufficiently to allow the ball to pass between it and said runway under the influence of gravity.

2. In a ball retarder, a brake shoe, means for pivotally mounting said shoe above an inclined runway with one end thereof disposed in the path of travel of balls rolling along said runway, said pivotal mounting means being located close to, but above the path of travel of a ball on said runway, a pneumatic dashpot including an upwardly movable piston, means for mounting said dashpot above said shoe, means connecting said piston to said shoe at substantially the point of contact thereof with a ball on said runway and between the free end of the shoe and the pivotal mounting thereof, and adjustable means for controlling the egress of air from said dashpot as the piston moves upwardly therein when the shoe is struck by a ball, said control means being adjusted in relation to the capacity of said dashpot, the throw of said shoe and the normal speed of the ball on said runway to completely but momentarily stop a ball before the shoe moves sufficiently to allow the ball to pass between it and the runway under the influence of gravity.

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