Feb. 4, 1941. C. LUND 2,230,758

BOWLING BALL RETURN TRACK

Filed May 1, 1940

Fig. 1.

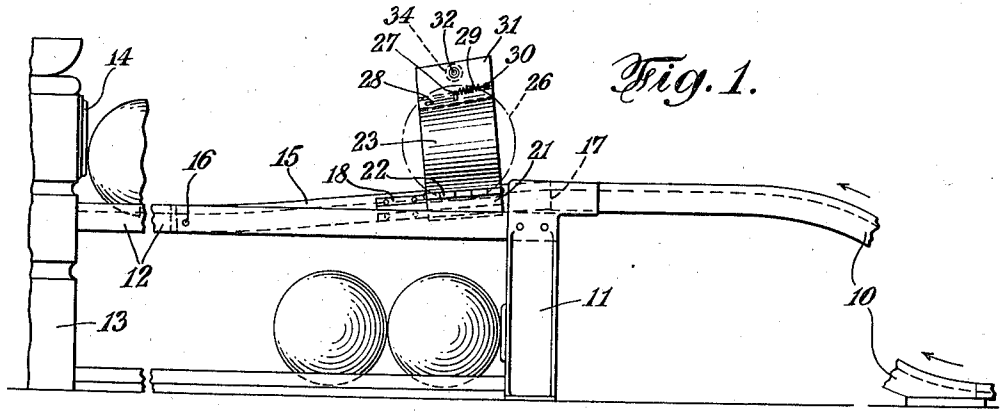


Fig. 2.

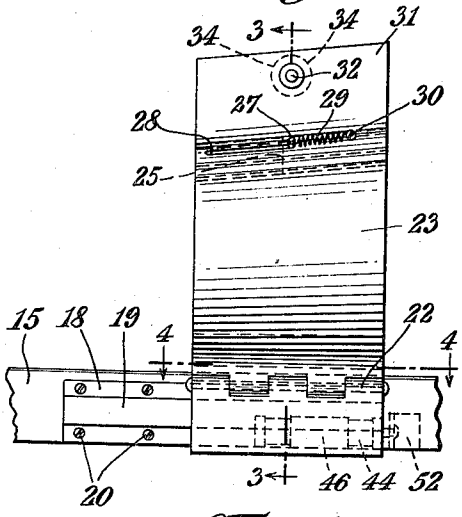


Fig. 3.

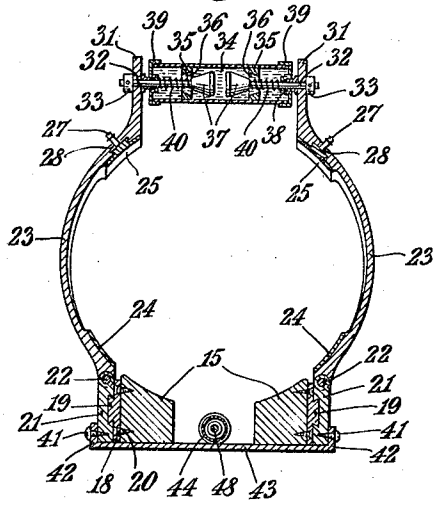


Fig. 4.

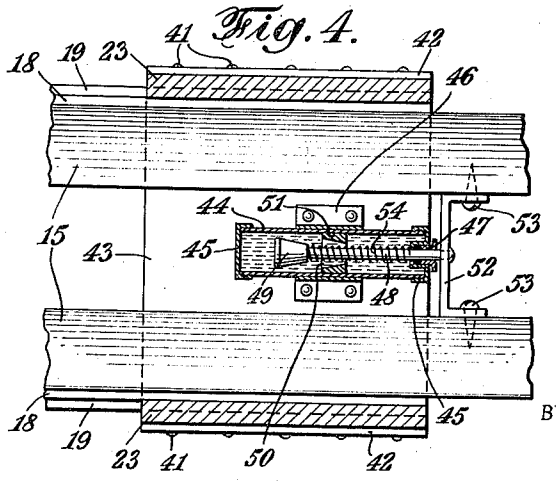
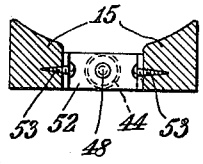


Fig. 5.



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BOWLING BALL RETURN TRACK

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7 Claims. (Cl. 273—47)

This invention relates to new and useful improvements in ball return tracks for bowling alleys.

It is a well known fact that the balls in being returned to the players' stand often are more or less damaged on account of the speed with which said balls hit the stop-post, or end-wall; or if some sort of means have been devised for retarding the speed of the ball as this is nearing the stop-post, such means have generally proved inadequate for said purpose.

As the cost of a bowling ball is quite considerable, it is, of course, of great importance to be able to control the speed of said ball at the end of its return travel, or take away any hitting force that may still reside in said ball at the end of its return trip, in order to prevent any damage to the ball in the way of chipping the latter.

This present invention purports to solve this problem, as it will appear from the description hereinafter.

With the above and other objects in view, this invention consists of the novel features of construction, combination and arrangement of parts, hereinafter fully described, claimed and illustrated in the accompanying drawing, forming part of this specification, and in which similar characters of reference indicate corresponding parts in all views, and in which:

Figure 1 is a side elevational view illustrating the principles of my invention, as applied to a bowling alley.

Figure 2 is a detail side elevational view of my invention proper, on an enlarged scale.

Figure 3 is a vertical transverse sectional view, taken on the line 3—3 of Figure 2.

Figure 4 is a transverse horizontal sectional view, taken on the line 4—4 of Figure 2.

Figure 5 is an end view of a part, as showing in Figure 4, partly in section.

Referring more particularly to the drawing, 10 indicates a ball-return-track of a bowling alley, supported by an upright 11; said upright connects by supporting rails 12 to an end-post or wall 13, which latter may, if desired, be provided with cushion means 14.

Connecting rails 15, supported by the rails 12 and connected to the latter as at 16, are joined to the rails 10, as shown at 17. Bars 18 formed with dove-tailed portions 19 are secured to the connecting rails 15 by means of screws 20. Members 21, formed with hinged portions 22 at their upper ends, are slidably mounted upon the bars 18. Side members 23 are hingedly connected to the members 21 as at 22. Said side members 23 are provided at their lowermost portions with stationary friction members 24, and at their upper ends with slidable friction members 25. The side members 23 and their friction members 24 and 25 are radially arranged, so as to conform with the diameter of a ball 26. The opening formed by the side members 23, with their friction parts 24 and 25, for engaging the ball 26, decreases in diameter towards the inner ends of said friction members. The slidable friction members 25 are provided with pins 27 passing through slots 28 in the side members 23; said pins 27 are connected to springs 29, which are secured to the side members 23 by means of screws 30. When the ball 26 in its course of travel engages the slidable friction members 25, the latter are carried forward as they assert a retarding influence upon said ball, and are after disengagement with the ball returned to their neutral position by means of the springs 29.

The side members 23 are at their upper ends provided with extensions 31 adapted to support piston rods 32, which latter are secured to said extensions by collars 33. Between the extensions 31 is mounted a cylindrical member 34 into which latter the piston rods 32 extend.

The cylindrical member 34 is formed with partitions 35, the said partitions are made with tapered bores 36 therein adapted for engagement with the tapered portions 37 of the piston rods 32. Stuffing boxes 38 may be provided in the caps 39 upon the ends of the cylinder 34 for sealing the latter against any leakage of the liquid during the hydraulic action in the operation of the device.

Springs 40, mounted upon the piston rods 32 between the caps 39 and the tapered portions of the piston rods 37, tend to return the side members 23 to neutral position, after the ball has passed through the opening formed by said side members.

When the ball 26 in its forward movement engages the friction members 24 and 25 the constantly decreasing diameter between said friction members causes the side members 23 to expand around the hinge portions 22; simultaneously the extensions 31 of the side members 23 will exert a pull upon the piston rods 32 in an outward direction.

The piston rods 32 will in view of the construction, as shown relative to the hydraulic means of which they form a part, cause a gradual expanding of the side members 23, until such time that the ball has passed through the side members 23 on to the connecting rails 15, which at that time will be in circular alignment with the friction members.

The side members 21 are connected by screws 41 to flanges 42 formed upon a connecting plate 43. A cylinder 44 provided with end-caps 45 is secured to the connecting plate 43 by means of a bracket 46. One of the said end-caps is provided with the usual stuffing box 47; a piston rod 48 passes through the latter, said piston rod is formed with a tapered piston head 49 adapted to

engage a tapered bore 50 of a partition 51 arranged in the cylinder 44.

The other end of the piston rod 48 is attached to a bracket 52, which in turn by means of screws 53 is secured to the connecting rails 15. A spring 54 mounted upon the rod 48 and engaging one of the end-caps 45 and the tapered piston head 49, has for its purpose to return the side members 21 and 23 to neutral position.

When the ball in its course of travel is meeting an increased resistance due to the, as said, constantly decreasing diameter of the opening between the side members 23, the complete device will be carried forward against the hydraulic action or resistance of the cylinder 44, thereby further reducing the shock effect to the ball.

It will thus appear that by the double hydraulic action of the device, in connection with other retarding features, as described herein, a gradual but definite check will be made upon the speed of the ball.

It may in conclusion be stated that the return movement to neutral position of the upper friction members 25 may be accomplished in different ways, besides that shown in the drawing. Thus, for instance, the spring may be placed behind said friction member in alignment therewith, so as to pull the latter back to its neutral position after operation.

It is obvious that changes may be made in the form, construction, and arrangement of the several parts, as shown, within the scope of the appended claims, without departing from the spirit of the invention, and I do not, therefore, wish to limit myself to the exact construction and arrangement shown and described herein.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class described, a return track, rails joined to the latter, and two substantially circular-forming members mounted upon said rails, upper slidable and lower stationary friction members mounted upon said circular-forming members, and hydraulic means arranged between the upper ends of the circular-forming members and between the bottom rails, respectively, substantially as and for the purpose set forth.

2. In a device of the class described, a return track, rails joined to the latter, and two side members mounted upon the rails, said side members being made to form a substantially circular opening for receiving a ball therein, with a forwardly decreasing diameter, upper slidable and lower stationary friction members arranged upon said side members, each of the latter being at their lower ends hingedly connected to a bottom member, said bottom members being slidably mounted upon the rails, and hydraulic means arranged at the top of the side members and between the bottom members, substantially as and for the purpose set forth.

3. In a device of the class described, in combination, a return track of a bowling alley, rails joined to said track, and two side members mounted upon the rails, said side members being made to form a substantially circular opening with a forwardly decreasing diameter for receiving a ball therein, upper slidable and lower stationary friction members arranged upon said side members, upwardly extending projections integral with the latter, and hydraulic means disposed between said projections and adapted to cooperate with the side members, each of the latter being at the lower end hingedly connected to a bottom member, said bottom members being slidably mounted upon the rails, and hydraulic means arranged between said bottom members, substantially as and for the purpose set forth.

4. In a device, as claimed in claim 3, and wherein each of the upper slidable friction members comprises a portion horizontally slidable in a recess of one of the side members, the latter being formed with a longitudinally extending slot therein, a pin fixedly secured to said portion and extending through said slot, and a spring connecting said pin to the side member.

5. In a device, as claimed in claim 3, and wherein each of the bottom members comprises a portion hingedly connected to one of the upper side members, a bottom plate formed with flanges secured to said bottom members, the latter being made with dove-tailed recesses therein, and means secured to the rails and adapted to slidably engage the dove-tailed recesses.

6. In a device of the class described, in combination, a return track of a bowling alley, rails joined to said track, and two side members mounted upon the rails, said side members being made to form a substantially circular opening with a forwardly decreasing diameter, for receiving a ball therein, upper slidable and lower stationary friction members arranged upon said side members, upwardly extending projections integral with the latter, and hydraulic means disposed between said projections and adapted to cooperate with the side members, each of the latter being at its lower end hingedly connected to an auxiliary side or bottom member, said bottom members being slidably mounted upon the rails, and hydraulic means arranged between said bottom members, the hydraulic means arranged between the upwardly extending projections comprising a cylinder, piston rods mounted in the cylinder and being supported by said projections, partitions arranged in said cylinder and being formed with tapered bores therein, said piston rods having tapered inner end portions adapted to engage said bores, and springs actuating said piston rods.

7. In a device of the class described, in combination, a return track of a bowling alley, rails joined to said track, and two side members mounted upon the rails, said side members being made to form a substantially circular opening with a forwardly decreasing diameter for receiving a ball therein, upper slidable and lower stationary friction members arranged upon said side members, upwardly extending projections integral with the latter, and hydraulic means disposed between said projections and adapted to cooperate with the side members, each of the latter being at its lower end hingedly connected to an auxiliary side or bottom member, said bottom members being slidably mounted upon the rails, and hydraulic means arranged between said bottom members, said latter hydraulic means comprising a cylinder, a plate connected to both members and having said cylinder fixedly mounted thereon, a partition formed with a tapered bore therein and arranged in said cylinder, a piston rod having a tapered inner end portion and being adapted to cooperate with said bore, a second plate secured to the rails, said piston rod being fixedly attached to said latter plate, and a spring mounted upon the piston rod for actuating the latter, substantially as and for the purpose set forth.

CHRISTEY LUND.