Sept. 5, 1950 J. E. BECK 2,521,563

PLAYING PIECE RETURN MECHANISM

Filed Dec. 31, 1949

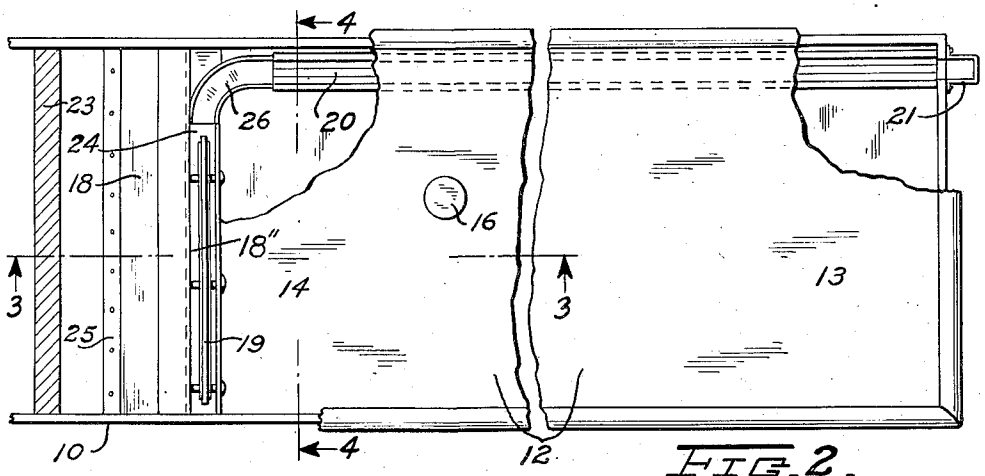


FIG. 2.

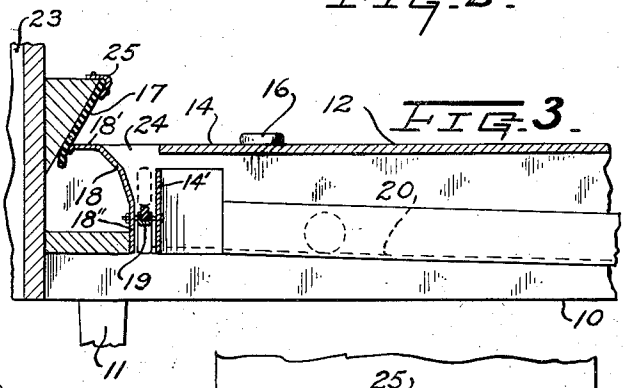


FIG. 3.

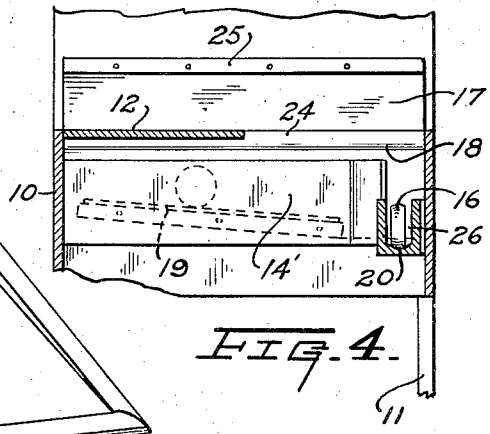


FIG. 4.

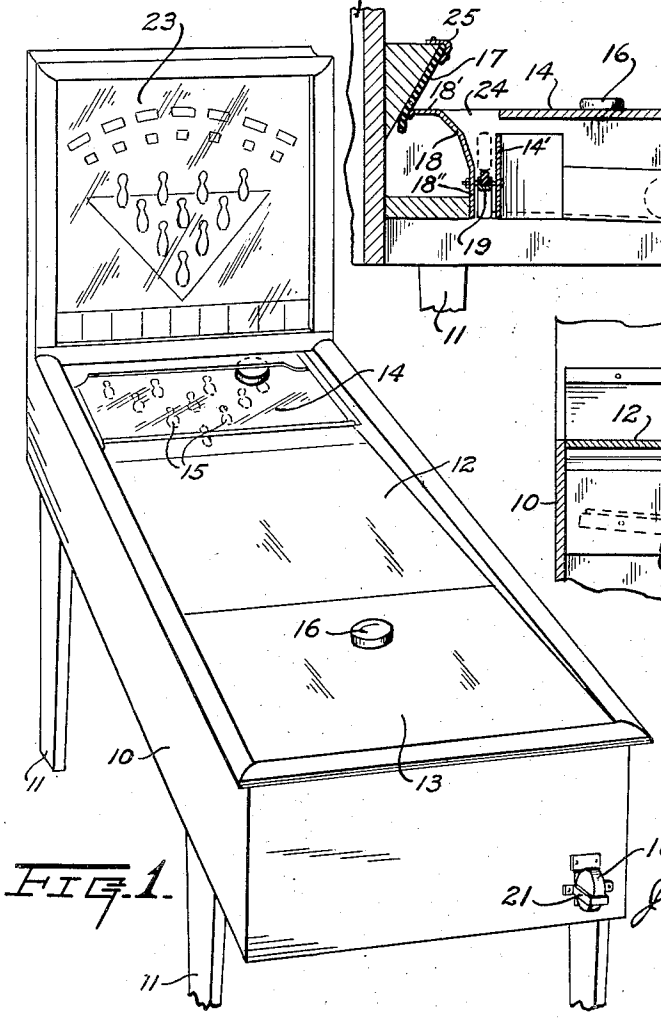


FIG. 1.

INVENTOR.
Joseph E. Beck
BY
Lieber & Lieber
ATTORNEYS.

Patented Sept. 5, 1950

2,521,563

UNITED STATES PATENT OFFICE

2,521,563

PLAYING PIECE RETURN MECHANISM

Joseph E. Beck, Milwaukee, Wis., assignor to Mitchell Novelty Company, Milwaukee, Wis., a corporation of Wisconsin

Application December 31, 1949, Serial No. 136,233

6 Claims. (Cl. 273—126)

1

The present invention relates generally to improved means for effecting return of playing pieces in game devices to their starting zone and, more particularly, to improved means for automatically returning to the players disk-shaped playing pieces such as pucks or the like in shuffleboard, hockey and similar game apparatus.

A primary object of the invention is to provide an improved means for automatically returning disk-shaped playing pieces to their starting point in games of various types wherein such pieces are propelled under the direction of a player to effect scoring.

Various mechanisms have in the past been provided to effect the return of disk-shaped playing pieces. Belt-type and similar conveying mechanisms are too expensive and are furthermore objectionable in that they constantly require servicing operations. Gravity return systems have not proven satisfactory either because the available head room would not permit disk-shaped playing pieces to be positively and effectively returned flat, or when they were returned on edge jamming at the mouth of the return passage has created a constant source of trouble.

It is therefore a further and more specific object of the invention, to perfect a means for a rolling-on-edge return of the disk-shaped playing pieces in which the mouth of the return passage is so shaped as to preclude jamming of the playing pieces therein.

These and other more specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of several steps involved in my improved puck returning systems, and of the construction and functioning of typical game apparatus for effecting automatic return of circular disc-like projectiles, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a perspective view of a game device embodying my invention, and showing several disc-like pucks in various positions thereon;

Fig. 2 is a fragmentary part sectional and somewhat enlarged top view of the table of the game device with portions of the upper deck broken away, and the score recording devices omitted;

Fig. 3 is a fragmentary longitudinal section through the same table, taken along the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary transverse vertical section through the table taken along the line 4—4 of Fig. 2.

2

In accordance with the present invention, I return a flat circular weight or puck from a scoring zone to a starting zone in a game device having a flat deck spanning the gap between such zones, by tilting the disc-like puck on edge promptly after it has been projected across and beyond any portion of the scoring zone, and by thereafter rolling the tilted puck on its peripheral edge down successive transverse and longitudinal inclines back to the starting zone. While the invention is especially applicable to a game table wherein only limited headroom is available for returning the puck to the operators, it is not my desire or intent to unnecessarily restrict the improvement to such games, and it is also contemplated that specific descriptive terms used herein be given the broadest interpretation consistent with the disclosure.

Referring to the drawings, the particular game device shown for purposes of disclosure comprises in general a casing or cabinet 10 mounted upon legs 11 and having an upper deck 12 provided with a flat elongated surface extending from a front starting zone 13 to and across a rear scoring zone 14 having a series or group of score recording devices 15 therein; one or more circular disc-shaped weights or pucks 16 adapted to be forcibly projected from the starting zone 13 along the deck 12 and over the scoring zone 14; a buffer plate 17 cooperating with an inclined transverse wall 18 to tilt the pucks 16 on edge and to deposit them upon a transverse inclined rail 19; and a longitudinal slightly inclined groove 20 at one side of and within the casing 10 for returning the pucks 16 from the lowest portion of the rail 19 to a receptacle 21 near the starting zone 13.

The cabinet 10 may be formed of any desired length and of any suitable material, and the deck 12 should be smooth and may be slightly inclined toward the starting zone 13. This deck 12 in a table type game, should also be disposed at a proper height above the floor so as to make the starting zone 13 conveniently accessible by a person standing on the floor in front of the machine; and while the pucks 16 of the machine illustrated are adapted to be forcibly projected or delivered along the upper deck surface by hand, some of these game tables may also be provided with mechanical projectors. The score recording devices 15 may also be of diverse types, and in the particular game shown herein, these devices 15 located within the scoring zone 14 are adapted to cooperate with a score board 23

so as to automatically record bowling scores on the board. The devices 15 and the board 23 are electrically actuable in a well known manner which constitutes no essential part of the present invention.

The mechanism for automatically returning the flat disc-like pucks 16 to the starting point after they have been delivered across or over the scoring zone 14 is however an important feature of my invention. It is fundamental that there is far less resistance to the rolling of a circular object than to the sliding of that object on a flat face. Since in game devices of this character there is not sufficient head room to provide the steep incline of a return chute necessary to permit a flatwise sliding return of the pucks, it becomes essential that the pucks be placed on edge so as to permit edgewise rolling. It would seem, upon first and superficial consideration, that any funnel or hopper shaped receptacle converging to terminate in a channel wider than the thickness of the puck yet considerably narrower than the diameter of the puck would function to place the puck on edge. Such, however, is not the case, for there is a great tendency for the puck to become wedged in such a return channel. This is particularly true where, in game devices of this character, the puck is provided with a band of resilient material about the periphery of the puck, which band being usually formed of rubber or like material has a high coefficient of friction. This is further especially likely to happen in game devices of the character here disclosed because the puck usually has sufficient momentum to carry it well beyond the terminating edge of the playing surface so that its descent into the mouth of the return passage is in a flat approximately horizontal position.

It has been found that it is extremely helpful in precluding such wedging of the puck if one wall of the hopper-like return channel or gap 24 is made substantially vertical. Herein the forward channel wall 14' is shown as the vertical wall. This wall extends transversely of the playing surface and since the score recording devices 15 herein are spread out over a considerable width of the playing surface, the wall 14' extends throughout approximately the entire width of the playing surface. Making the adjacent wall the vertical one has the advantage that a puck 16 will either remain visible on the playing surface or, if it is traveling just fast enough to project slightly more than half way over the edge of the playing surface, it will tilt and drop edgewise into the mouth of the return gap 24.

Opposite the vertical wall 14' and also extending transversely substantially across the entire width of the playing surface is a rear wall 18. This wall, instead of being straight and vertical, extends generally downwardly and toward the wall 14', herein with progressively increasing inclination, so as to direct any puck 16 coming in contact therewith downwardly into the mouth of the return passage or gap 24 in an on-edge position. From its upper edge 18', the wall 18 extends downwardly and toward the wall 14', at progressively larger angles with the plane of the playing surface, terminating in a vertical portion 18'' disposed parallel with the wall 14' and spaced therefrom by a distance slightly greater than the thickness of a puck. The rail 19 may also be formed of rubber and is disposed beneath the gap 24, and the lower end of the rail 19 is connected to the upper end of the inclined guide-

way or groove 20 by means of a smoothly curved guiding section 26. The groove 20 is smooth throughout its length and connects the curved section 26 with the puck receptacle 21 at the front of the machine, and the inclination of the groove 20 is only sufficient to insure rolling of the tilted pucks 16 on their peripheral edges therealong, thus permitting concealment of the guideway within the cabinet 10.

During normal use of the improved game, one or more circular flat disc-like pucks 16 of considerable weight may be utilized, and these will normally be stored within the receptacle 21 and in the adjacent lower end of the inclined groove 20. The player or operator may then remove the successive pucks 16 from the receptacle 21 and after placing each puck flatwise upon the starting zone 13 of the deck 12, it may be forcibly slid along the deck toward the scoring zone 14. As the advancing puck slides over and contacts the scoring devices 15 it automatically records the score upon the score board 23, and as it reaches the end of the deck 12 directly beyond the scoring zone 12 the puck either spans the gap 24 and strikes the buffer plate 17, or it drops by gravity over the end of the deck 12. If the puck is travelling fast, it rebounds from the resilient inclined plate 17 and is tilted on edge dropping by gravity through the gap 24 and onto the inclined wall 18 which promptly functions to set the circular puck 16 on edge upon the inclined rail 19. If it is travelling slowly it drops on edge directly through the gap 24, and upon being deposited edgewise upon this rail 19 as depicted in dotted lines in Figs. 3 and 4, the puck 16 rolls by gravity downwardly along the rail 19 around the section 26 and along the groove 20 back toward the receptacle 21, from whence it may be subsequently removed in order to repeat the cycle of operations. In the event that a puck 16 is not projected with sufficient force to reach the scoring zone or the gap 24, then the player may readily grasp the missle by hand and properly repeat the shot.

From the foregoing detailed description of the construction and operation of a typical game involving my invention, it should be apparent that I have in fact provided a simple method of effectively returning the flat disc-like pucks 16 to the starting point or zone 13 automatically and without the aid of complicated mechanism. The method may be carried on in various types of games, and especially in table games wherein the return rails and grooves may be disposed entirely within compact cabinets, and the apparatus requires no special attention after having been properly installed. The apparatus for tilting the flat circular pucks 16 on edge performs its function rapidly and with minimum noise, and the slight inclination of the rail 19 and guideway 20 causes the righted pucks to roll rapidly upon their peripheral edges from the scoring zone 14 to the starting zone by gravity alone. In order to further reduce the noise, each puck 16 may be embraced by a rubber band or tire in any convenient manner, and the return of the pucks to the exposed receptacle 21 may also be coin or otherwise controlled. The invention has gone into extensive and successful commercial use especially in connection with a bowling type shuffle table, and the apparatus for exploiting the improvement can be manufactured at very moderate cost.

It should be understood that it is not desired to limit this invention to the exact details of construction and operation of the apparatus, herein shown and described, for various modifications

within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. In a game device having a playing surface over which a disk-shaped playing piece may be slidably propelled generally in one direction and a storage station for the playing piece located at the end from which the playing pieces are propelled, means for returning the playing piece to the storage station comprising channel-forming means extending generally in said direction and inclined downwardly toward the storage station for guiding the playing piece rollably on edge, a playing piece receiving hopper disposed beneath the plane of the playing surface and having a playing piece receiving opening adjacent a marginal edge of a portion of said playing surface, said hopper comprising an approximately plane and vertical wall extending transversely of said direction, a second wall extending transversely of said direction opposite said vertical wall, said second wall sloping from the top progressively inwardly of said hopper to approach the vertical and being spaced from the vertical wall a distance not closer than the thickness of the playing piece, and a bottom inclined toward said channel forming means, said walls and bottom forming a guide channel extending transversely of said direction, and a curved channel-forming section connecting said guide channel and said channel-forming means.

2. In a game device having a playing surface over which a disk-shaped playing piece may be slidably propelled generally in one direction and a storage station for the playing piece located at the end from which the playing pieces are propelled, means for returning the playing piece to the storage station comprising a channel-forming means extending generally in said direction and inclined downwardly toward the storage station for guiding the playing piece rollably on edge, a playing piece receiving hopper disposed beneath the plane of the playing surface and having a playing piece receiving opening adjacent a marginal edge of a portion of said playing surface, said hopper having on its side nearer the storage station an approximately plane and vertical wall extending transversely of said direction and a second wall forming the opposite side of the hopper also extending transversely of said direction, said second wall sloping from the top progressively inwardly of said hopper to approach the vertical and together with said plane wall forming a guide channel extending transversely of said direction and provided with a bottom inclined toward said channel-forming means and just slightly wider than the thickness of a playing piece, and a curved channel-forming section connecting said guide channel and said channel-forming means.

3. In a game device having a playing surface over which a disk-shaped playing piece may be slidably propelled generally in one direction and a storage station for the playing piece located at the end from which the playing pieces are propelled, means for returning the playing piece to the storage station comprising channel-forming means extending generally in said direction and inclined downwardly toward the storage station for guiding the playing piece rollably on edge, a playing piece receiving hopper disposed beneath the plane of the playing surface and having a playing piece receiving opening adjacent a marginal edge of a portion of said playing surface, said hopper having an approximately plane and vertical wall extending transversely of said direction and a second wall extending transversely of said direction opposite said plane wall, said second wall from its top edge inwardly being progressively inclined to approach the vertical and to approach said plane wall to form therewith a guide channel of a width slightly greater than the thickness of a playing piece so as to receive a playing piece in on edge position only and said guide channel having a bottom inclined toward said channel-forming means, and a curved channel-forming section connecting said guide channel and said channel-forming means.

4. In a game device having a playing surface over which a disk-shaped playing piece may be slidably propelled generally in one direction and a storage station for the playing piece located at the end from which the playing pieces are propelled, means for returning the playing piece to the storage station comprising channel-forming means extending generally in said direction and inclined downwardly toward the storage station for guiding the playing piece rollably on edge, a playing piece receiving hopper disposed beneath the plane of the playing surface and having a playing piece receiving opening adjacent a marginal edge of a portion of said playing surface, said hopper comprising an approximately plane and vertical wall extending transversely of said direction, a second wall inclined downwardly toward said vertical wall and extending transversely of said direction to form a guide channel and means forming a bottom for said channel slightly wider than the thickness of a playing piece and inclined downwardly toward said channel-forming means, and means forming a curved channel section connecting said guide channel and said channel-forming means.

5. In a game device having a playing surface over which a disk-shaped playing piece may be slidably propelled generally in one direction and a storage station for the playing piece located at the end from which the playing pieces are propelled, means for returning the playing piece to the storage station comprising a channel-forming means extending generally in said direction and inclined downwardly toward the storage station for guiding the playing piece rollably on edge, a playing piece receiving hopper disposed beneath the plane of the playing surface and having a playing piece receiving opening adjacent a marginal edge of a portion of said playing surface, said hopper having an approximately plane and vertical wall extending transversely of said direction, a second wall portion extending transversely of said direction inclined downwardly toward said vertical wall with the lower edge of said wall portion spaced from said vertical wall a distance less than the diameter of the playing piece and greater than the thickness of said playing piece to form a guide channel supporting the playing piece generally in on edge position, and a member forming a bottom for said hopper inclined toward said channel-forming means, said channel-forming means being connected at its higher end in playing piece receiving relation to the lower end of said hopper.

6. In a game device having an elogated playing surface with a transversely extending opening therein and a scoring zone immediately adjacent the opening over which a disk-shaped playing piece may be propelled generally longitudinally thereof and across the scoring zone and a storage station for the playing piece near the

end of the playing surface remote from the scoring zone, means for returning the playing piece to the storage station comprising a playing-piece-receiving hopper disposed beneath the opening in the playing surface and having an approximately plane and vertical wall extending transversely of the playing surface and disposed in the same vertical plane as the adjacent edge of the opening in the playing surface, a second wall extending transversely of the playing surface opposite said plane wall, said second wall having a portion extending above the playing surface and having beneath the playing surface a portion inclined progressively to approach the vertical and said plane wall, and an inclined bottom slightly wider than the thickness of a playing piece, said walls and bottom forming a guide channel extending transversely of the playing surface, and means forming an inclined channel for guiding a playing piece while rolling on its periphery, said channel-forming means being connected at one end in playing-piece-receiving relation to the lower end of said hopper and extending from there in a direction generally longitudinally of the game device playing surface.

JOSEPH E. BECK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
694,121	Vaughan	Feb. 25, 1902
1,106,859	Ayers	Aug. 11, 1914
1,562,008	Stevenson	Nov. 17, 1925
2,159,966	Dunham	May 30, 1939
2,317,126	Biderman	Apr. 20, 1943
2,494,929	Colaluca	Jan. 17, 1950

FOREIGN PATENTS

Number	Country	Date
758,602	France	Jan. 20, 1934