March 1, 1938. W. G. HAWLEY 2,109,638

GAME APPARATUS

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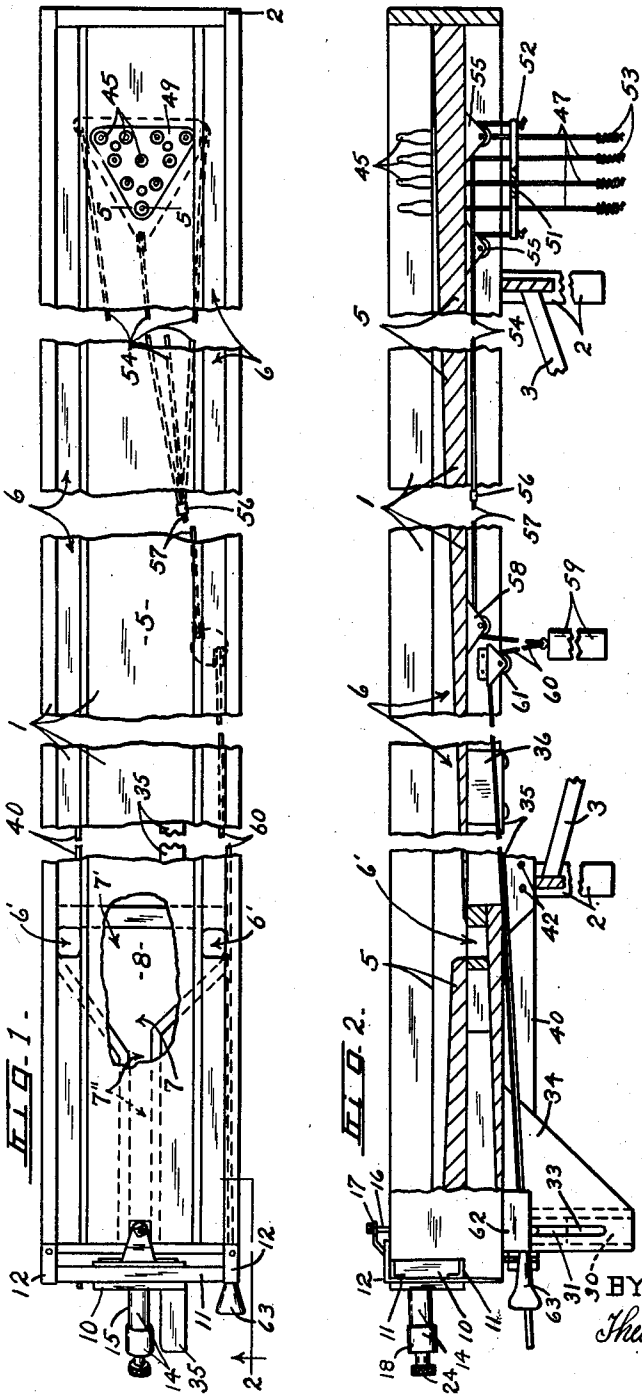


FIG. 1.

FIG. 2.

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FIG. 3.

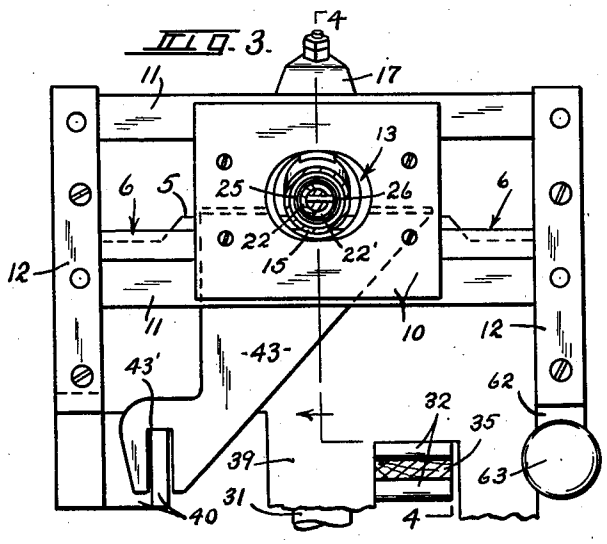


FIG. 4.

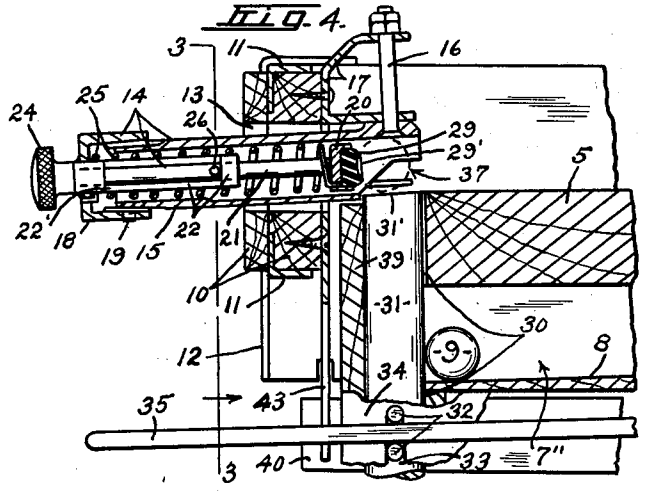


FIG. 5.

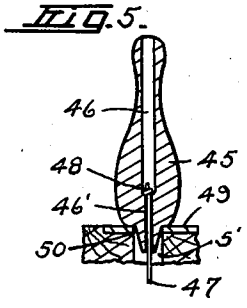
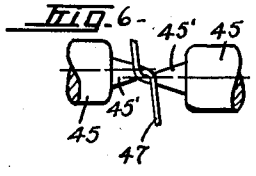


FIG. 6.



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GAME APPARATUS

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4 Claims. (Cl. 273—45)

This invention relates to improvements in a game apparatus and pertains more particularly to a portable or miniature bowling game adapted to be used in the home, the club and various places of amusement.

An object of the invention is to provide a game of the above mentioned class with an improved mechanical means for actuating or propelling a missile constituting a portion of the apparatus.

Another object of the invention is to provide novel means for bringing the missile into operative relation with the actuating or propelling means.

In certain bowling games of the above mentioned class, a mechanical means has been provided whereby the knocked down bowling pins may be reset by a person as the player, positioned at a distance from the bowling pins. Such mechanical reset devices have usually employed flexible cords or strings secured to the bowling pins and passed through apertures in the alley bed in such a manner that when a downward pull is exerted on the cords, the bowling pins will be drawn to their operative playing position. Such devices, insofar as I am aware, have been impractical for the reason that the cords or strings often become wound around or entangled with each other as the pins are knocked over to such an extent that the reset apparatus will not effect the setting up of the pins without the necessity of first untangling the cords by manual manipulation of the pins. This inability to separate the cords from each other by use of the reset mechanism alone has been primarily due to the relatively broad, flat construction of the bottom or base ends of the pins which, when tension is applied to the strings or cords attached to the pins, are brought into abutting relation with each other and thereby prevent the pins from swinging past each other so as to permit the strings or cords to untangle.

A further object of the invention resides in providing a bowling alley with improved mechanical means for setting up the bowling pins which may be controlled by the player of the game in a simple and efficient manner from the bowling position.

Other objects and advantages pertaining to the structure of the device and to the form and relation of the parts thereof will more fully appear from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a top plan view of a game embodying my invention and illustrating intermediate portions thereof broken away.

Figure 2 is a vertical sectional view partly in elevation taken substantially in the plane of the line 2—2, Figure 1.

Figure 3 is a transverse sectional view taken on line 3—3, Figure 4.

Figure 4 is a detail vertical sectional view of the forward end portion of the game board or table taken in the plane of the line 4—4, Figure 3.

Figure 5 is a vertical central sectional view of a bowling pin comprising a portion of the apparatus and a portion of the bowling alley bed taken on line 5—5, Figure 1.

Figure 6 is a fragmentary side elevation of the bottom or lower end portions of a pair of my novel bowling pins illustrating the manner in which they function to permit the operating cords therefor to be readily disentangled during the operation of my novel setting-up apparatus.

The device as illustrated in the drawings, comprises a portable game board or table 1 of the rectangular shape of a bowling alley and which is supported upon suitable legs 2 reinforced by braces 3. The board or table 1 comprises a longitudinally extending centrally located alley bed 5 and side gutters 6 which are inclined from opposite ends of the board or table 1 downwardly to a position a relatively short distance from the forward end of the table, as illustrated in Figure 2 where each gutter is provided with a vertical aperture 6' in communication with a runway 7 arranged at the forward end of the table beneath the alley bed 5. The runway 7, as shown in Figure 1, is provided with a tapered portion 7' communicating with the gutter apertures 6' and a relatively narrow channel portion 7'' which extends forwardly from the tapered portion 7' to the forward end of the table 1 in a plane substantially midway between the sides of the alley bed 5. The bottom or floor 8 of the runway 7 is inclined downwardly from the rear end thereof to the forward end of the table for guiding the missile, as a bowling ball 9, from the gutter apertures 6' to the forward end of the table.

A carriage 10, positioned at the forward end of the table 1, is slidably mounted upon a pair of angle guide bars 11 arranged in vertical parallel spaced relation transversely of the table and which have the ends thereof secured in any suitable manner to corresponding end brackets 12 secured to the end of the table 1, one at either side thereof. The carriage 10 is of less width than the distance between the brackets 12 so as to permit a predetermined amount of movement of the carriage laterally of the table. The carriage 10 is provided with a central opening 13

which extends transversely therethrough for the reception of a projector 14.

The projector 14 comprises a tubular case 15 of less diameter than the opening 13 and which extends beyond opposite sides of the carriage 10. The inner end of the case 15 terminates over the alley bed 5 and is secured to a pivotal spindle 16 which extends upwardly therefrom through aligned apertures provided in a U-shaped bracket 17 secured to the upper portion of the carriage 10. The opposite end of the case 15 is provided with a cap 18 which may be removably secured in any suitable manner as by one or more set screws 19 to the case 15 to prevent relative axial and rotary movement of the case and cap. The interior of the tubular case 15 is of sufficient diameter to readily receive the missile 9 therein and has mounted therein a plunger 20 having a plunger rod 21 mounted for axial and rotary movement in a guide sleeve 22 fixedly secured in any suitable manner as by spot welding, soldering or the like, to the cap 18 and which projects some distance from the cap 18 into the case 15. The rod 21 extends outwardly beyond the cap 18 and sleeve 22 and has secured thereto in any suitable manner a finger knob 24 by which the plunger may be manually operated.

A coil spring 25 is mounted upon the plunger rod 21 and guide sleeve 22 intermediate the plunger 20 and cap 18 for actuating the plunger axially in one direction. This spring has one end thereof secured to the plunger 21 and the other end secured to the cap 18 in the manner illustrated in Figure 4 for yieldingly maintaining the plunger against rotary movement. That is, the spring 25 functions to yieldingly maintain the plunger against rotation relative to the housing 15, and if the plunger is thus rotated as by hand against the action of the spring, the spring will return the plunger to its initial position by rotating the same upon the plunger being released in the reverse direction to that produced by hand irrespective of the direction in which the plunger was initially rotated. The plunger rod 21 is provided with a pin 26 which extends outwardly from one side of the rod into an elongated slot 22' formed in one side of the guide sleeve 22 intermediate the ends thereof as shown in Figures 3 and 4 for limiting the rotary movement of the rod and the plunger 20. The inner end of the plunger 20 is recessed and has secured in said recess an end tip 29 composed preferably of rubber or other resilient material. The exposed end of the tip 29 is slightly concave as at 29' to correspond to the curvature of the peripheral surface of the ball 9 for frictionally engaging said surface for the purpose of transmitting any rotary movement of the plunger produced by the spring 25 to the missile or ball 9 during the projection of the ball for a purpose presently described.

At the forward end of the table 1 is provided a vertically disposed cylindrical opening 30 of slightly greater diameter than the ball 9 and which extends downwardly from the upper surface of the alley bed 5 to some distance below the table 1 as illustrated in Figures 2 and 4. This opening 30 is arranged in substantially coaxial alignment with the pivotal spindle 16 when the carriage 10 is in its normal position and is in communication with the forward end of the channel portion 7'' of the runway 7. In the opening 30 is slidably mounted a lifting or feeding plunger 31 which is of sufficient length to extend from the upper face of the bed 5 downwardly to a position beneath the channel 7'' and has secured to the lower end portion thereof a pair of pins 32 spaced axially of the plunger 31 and which extend laterally from the plunger through an elongated slot 33 provided in the side wall 34 of the opening 30 as shown in Figures 2 and 4. The pins 32 project some distance beyond the wall 34 and receive therebetween an actuating spring 35.

The spring 35, in this instance is a flat bar shaped member arranged beneath the table 1 and has the inner end thereof secured to a block 36 secured to the lower face of the alley bed 5 some distance from the forward end of the table 1 as shown in Figure 2. The forward end of the spring extends a short distance beyond the pins 32 and end of the table 1 in convenient position to be engaged by the player for moving the plunger 31 downwardly against the action of said spring to align the upper end of the plunger with the bottom 8 of the channel 7'' to permit the missile or ball 9 to roll upon the upper end of the plunger so that as said plunger is returned to its normal uppermost position, the missile or ball will be elevated thereby into operative alignment with the alley bed 5 and projector 14.

The alley bed 5 is designed to be maintained in substantially a level or horizontal position while the case 15 of the projector 14 is mounted on the carriage 10 in slightly inclined relation to the upper surface of the bed 5 as illustrated in Figure 4. The forward end portion of the case 15 has the lower side wall thereof cut away as at 37 to receive the ball 9 carried by the plunger 31 into the interior thereof. While the plunger 20 is so mounted in the housing 15 that the tip 29 will be maintained in slightly outward spaced relation to the plane of movement of the plunger 31 so that as the ball or missile 9 is elevated by the plunger 31 into alignment with the bed 5, said ball or missile may roll into contact with the tip 29. This movement of the ball toward the plunger is effected by the upper end 31' of the plunger 31 which is slightly inclined relative to the horizontal so as to provide a smooth, substantially continuous surface over the opening 30 from the interior of the case 15 to the upper surface of the alley bed 5 when the plunger 31 is in its normal uppermost position. Furthermore, the inclined end 31' of the plunger assists in maintaining the ball 9 in engagement with the plunger during the elevation of the ball due to the fact that the ball is caused to roll thereby into contact with the front wall 39 of the opening 30 and maintained in such position until the plunger is returned to its normal position.

It will now be observed that when the spindle 16 is in co-axial alignment with the plunger 31, the ball or missile 9 will always be brought by said plunger to a position within the case 15 irrespective of any angular position the case 15 may assume about the spindle 16 as a pivot. In order to normally maintain the spindle 16 in co-axial alignment with the plunger 31, I have provided a spring member 40 which, like the spring member 35, is a substantially flat bar member and is arranged edgewise beneath the game board 1. The spring 40 is secured at its inner end as at 42 to one side of the game board while the outer end of the spring extends beneath the guide bars 11 and rides in a slot 42 provided in a pendant arm 43 secured at its upper end to the carriage 10. The relation of the arm 43 and spring 42 is such that when the spring is in its normal position, the carriage 10 will be maintained sub-

stantially midway between the end brackets 12 with the spindle 16 in co-axial alignment with the plunger 31.

The bowling pins 45, as shown in the drawings, are constructed similar to the conventional bowling pin but on a reduced scale with the exception that the pins are each provided with a tapered or conical extension 45' at the base end thereof arranged co-axially with the pin and a central bore 46 extending from the upper end of the pin downwardly through said extension. Each of the extensions 45' has the base portion thereof of less diameter than the adjacent end of the pin as illustrated in Figures 5 and 6 so that the pin is provided with a flat surface surrounding the projection of ample size to support the pin in the upright playing position in a manner which will be presently described.

The lower end portion as 46' of the bore is smaller in diameter than the remaining portion thereof for the reception of a cord 47 which has the upper end thereof provided with an enlarged portion or knot 48 adapted to engage the shoulder formed between the upper end of the reduced portion 46' and the remaining portion of the bore 46 for limiting the downward movement of the cord through the pin.

The pins are mounted upon a positioning plate 49 which, in this instance, is triangular in plan view and is set into a recess formed in the upper surface of the alley bed 5 in spaced relation to the rear end thereof so that the upper surface of the plate is flush with the upper surface of the alley bed. The plate 49 is provided with a plurality of, in this instance ten, orifices 50, one for each pin, of substantially the same diameter as the base portion of the pin projections 45' for receiving said projections. The orifices 50 are arranged in accordance with the desired arrangement of the pins when they are set in the operative or playing position upon the alley bed and each orifice is in registration with a corresponding aperture 5' in the alley bed 5. The cords 47 extending through the apertures 5' also pass through corresponding orifices 51 formed in a reset plate 52 positioned beneath the alley bed and which are in alignment with corresponding orifices 50 in the plate 49. The lower ends of the cords 47 each have mounted thereon a coil spring 53 adapted to be engaged by the reset plate 52 for yieldingly connecting said plate with the cords.

The plate 52 is of sufficient weight to readily actuate all the pins 45, and in this instance is a triangular member similar to the plate 49 and has secured at each apex thereof a cable 54 which extends upwardly over a corresponding sheave or pulley 55 secured in any suitable manner to the undersurface of the alley bed 5. From the sheaves 55 the cables extend forwardly and are connected at their ends as at 56 to a common cable 57 which extends over a sheave 58 also secured to the under side of the bed 5 and has the forward end thereof secured to an actuating member 59 which, in this instance is a weight that preponderates the reset plate 52 for normally maintaining the reset plate in its uppermost position out of engagement with the springs 53. The actuating member 59 is also connected with a second cable 60 which extends upwardly therefrom over a sheave 61 secured to the game board 1 and thence forwardly through an opening provided in a guide block 62 secured to the adjacent side member of the table 1. The forward end of the cable 60 has secured thereto a finger knob 63 by which the cable may be manually pulled forwardly for elevating the weight 59. The length of the cable 60 is such that when the knob 63 is in engagement with the guide block 62, the weight will be maintained in such a position that the plate 52 connected therewith will be maintained in its normal uppermost position.

It will now be observed from the foregoing description that the missile or ball 9 may be actuated in much the same manner as on the large, regulation size bowling alley. This is primarily due to the universal positioning of the projector 14 which may be obtained. For instance, the projector may be swung about the axis of the spindle 16 to obtain any desired angular relation thereof to the bowling alley bed and the pins 45 mounted thereon. Furthermore, the projector may be moved laterally of the alley bed 5 by sliding the carriage 10 in one direction or the other from the normal position along the guide bars 11 against the action of the spring 42. As soon, however, as the carriage 10 is released by the operator the spring 42 will function to return the carriage and, therefore, the projector 14, to the normal position in a plane substantially midway between the sides of the bowling alley bed 5 with the spindle 16 in co-axial alignment with the plunger 31.

After a ball 9 has been propelled by the projector plunger 29, another ball may be brought into operative relation with the projector by the operator simply pressing downwardly upon the forward or free end of the spring 35 until the upper end 31' of the plunger 31 registers with the upper surface of the bottom 8 whereupon the ball 9 will roll upon the upper end of the plunger due to the inclination of the bottom 8 and end 31' of the plunger. As the spring 35 is then released, the plunger will be raised by the action of the spring until the uppermost pin 32 engages the wall at the upper end of the slot 33 whereupon the upper end 31' of the plunger will align with the upper surface of the bed 5 and the ball will be maintained in operative alignment with the plunger 29. As the plunger 29 is moved axially outwardly by the operator against the action of the spring 25, the spring may be also tensioned circumferentially by the operator rotating the plunger through the medium of the finger knob 24 in one direction or the other. It will be obvious that when the spring 35 has been so tensioned that as the plunger is released, the spring will produce a corresponding rotary movement of the plunger which will be transmitted to the ball 9 by the engagement of the tip 29 with the ball, and thereby produce a spinning of the ball around the horizontal axis thereof simultaneously with the projection of the ball whereby the ball will have a greater degree of lateral movement than that normally obtained when the ball is merely rolled forwardly upon the engagement thereof with an object such as a bowling pin, thereby obtaining an effect similar to the effect produced when englishing the ball with a cue.

When one or more of the bowling pins 45 have been knocked down by a ball 9, the pin or pins may be reset in proper relation with the bowling alley bed and with each other by the operator merely pulling outwardly on the finger knob 63 to elevate the weight 59. As the weight 59 is thus elevated, the plate 52 will descend into engagement with the springs 53 associated with the knocked down pins and thereby return the pins to their proper upright position upon the plate

49. It will be obvious that all of the pins will be properly positioned irrespective of any inequality occurring in the length of the cords 47 due to the resiliency of the springs 53.

Furthermore, it will be observed that if the cords associated with the pins become entangled or wrapped around each other as the pins are knocked down by the ball 9, said cords will be readily unwound or disentangled as they are drawn downwardly by the action of the reset plate 52 due to the fact that as illustrated in Figure 6, the corresponding pins will be maintained out of co-axial alignment with each other by the cords attached thereto. That is, the axes of the pins when the pins are in substantial alignment with each other will be maintained spaced apart as the pins are drawn toward each other by the cords a distance not less than the diameter of a cord and inasmuch as the lower or apex end of the projections is substantially equal to or only slightly greater in diameter than that of the cord, the free ends of said projections will readily slide past each other as the pins approach each other. Then these tapered portions, as they slide along each other, form a fulcrum about which the pins easily swing in a direction to unwind or disentangle the operating cords or strings after which the pins may be drawn by the cords to the upright playing position with the projection of each pin extending into a corresponding orifice 50 in the plate 49 as illustrated in Figure 5.

Although the construction and operation of the device shown and described, are particularly simple, practical and efficient, it is evident that various changes may be made in the detailed construction without departing from the spirit of the invention as set forth in the appended claims.

1. In combination, a perforated bowling alley bed, a set of bowling pins adapted to be disposed in an upright position upon said bed, means for setting up said pins comprising a perforated weight member positioned beneath the alley bed at one end thereof, cords connected with the pins and extending through the perforations in said alley bed and the weight member, springs mounted on the cords beneath the weight member adapted to be engaged by said weight member for yieldingly actuating said cords, a second weight member mounted beneath the alley bed intermediate the ends thereof and connected with the first weight member adapted to move said first weight member to and maintain the same in an elevated inoperative position, and control means including a finger knob positioned at the other end of the alley bed operatively connected with the second weight member by which the same may be manually rendered ineffective for maintaining the first weight member in the inoperative position.

2. In a bowling game comprising, in combination, an alley bed having perforations extending therethrough, a set of bowling pins adapted to be knocked over from an upright position on said alley bed, each of said bowling pins having a tapered portion associated with the base end thereof in substantially coaxial relation therewith, each of said tapered portions being adapted to extend into a respective one of said perforations and having an orifice arranged substantially coaxial therewith, a plurality of flexible cords, one cord for each pin, each of said cords being extended outwardly through the orifice of the tapered portion of a respective pin and downwardly through a corresponding alley bed perforation to a position some distance beneath said alley bed, and means positioned beneath the alley bed engageable with the lower end portions of the cords for substantially simultaneously operating said cords to return the pins from the knocked-over position to the upright position on the alley bed, said cords and orifices being of substantially the same diameter and each tapered portion having opposite sides thereof extending from the outer end of the orifice toward the base of the bowling pin in substantially straight diverging planes to form a relatively sharp point at the outer or lower end of the tapered portion of substantially the same diameter as the cord so that said outer or lower ends of the tapered portions of two or more pins having the cords thereof entangled or wound around each other as the pins are knocked over will readily move past each other and the sides of said tapered portions subsequently engage each other with a sliding cam action to move the pins into angular relation with each other as the cords are drawn downwardly through the bed apertures and thereby readily effect separation of such pins and cords during the resetting of the pins.

3. In combination, a perforated bowling alley bed, a set of bowling pins adapted to be disposed in an upright position on said bed, means for setting up said pins comprising a perforated weight member positioned beneath the alley bed at one end thereof, flexible cords connected with the pins and extending through the perforations in said alley bed and the weight member, springs mounted on the cords beneath the weight member adapted to yieldingly transmit motion from the weight member to the cords for drawing said cords downwardly through the alley bed apertures, actuating means mounted beneath the alley bed intermediate the ends thereof and operatively connected with the weight member for yieldingly urging the weight member to and maintaining the same in an elevated inoperative position, and control means including a finger-piece positioned at the other end of the alley bed operatively connected with the actuating means by which the same may be manually rendered ineffective for maintaining the weight member in said inoperative position.

4. A device as in claim 3 wherein the lower base end of each pin is provided with a guide cone adapted to extend into a corresponding aperture of the alley bed, each of said guide cones having a corresponding cord extending outwardly from its lower or apex end substantially coaxially therewith, said apex end of each cone being of substantially the same diameter as the cord so that said apex ends of cones of two or more pins having the cords thereof entangled or wound around each other as the pins are knocked down will readily move past each other and the sides of said cones subsequently engage each other with a sliding cam action to move the pins into angular relation with each other as the cords are drawn downwardly through the alley bed apertures and thereby readily effect separation of such pins and cords during the resetting of the pins.

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